FAMILY MEDICINE

A Practical Approach

SECOND EDITION

Khalid S. Al-Gelban • Yahia M. Al-Khaldi • Mohammad M.Diab

FAMILY MEDICINE

A Practical Approach

Second Edition

Family Medicine

A Practical Approach

Second Edition

Khalid S. Al-Gelban • Yahia M. Al-Khaldi • Mohammad M. Diab

Order this book online at www.trafford.com
or email orders@trafford.com

Most Trafford titles are also available at major online book retailers.

Printed in Victoria, BC, Canada.

ISBN: 978-1-4269-2440-8 (sc)
ISBN: 978-1-4269-2441-5 (dj)

Library of Congress Control Number: 2010902136

Medicine is an ever-changing science. Readers are encouraged to check that changes have not been made in the recommended doses or in the contraindications of each drug they plan to prescribe.

Khalid S. Al–Gelban, MD, SSCFM, CABFM, JBFM
Associate Professor, Family Medicine
Chairman, Family & Community Medicine,
College of Medicine,
Dean, College of Health Sciences,
King Khalid University, Abha

Yahia M. Al-Khaldi, MD, CABFM
Director, Family Medicine Training Program
Aseer-Abha

Mohammad M. Diab, MD, MRCGP (UK)
Associate Professor, Family Medicine
Department of Family &Community Medicine
College of Medicine,
King Khalid University, Abha

Publication Data

Dedication

To our parents, wives and children, who spared us for countless weekends while we worked on this book.

Khalid, Yahia and Mohammad

Preface

This is an era of Family Medicine, where the emphasis is placed on providing the best services with the lowest cost. Many medical schools see family medicine clinics as a natural place for clinical education of medical students. It is a style of practice that is being focussed on the patient, the family and the community, rather than the disease.

Caring of patients in the family practice setting requires a different emphasis in skills and attitudes than that used in hospital – based care. It has blended the science of the biomedical model with the more ecologic and spiritual approaches of holistic care.

Where there are few books that are genuinely useful for family physicians, it is with great pleasure we introduce to you the ***Family Medicine: A practical Approach,*** which provides a roadmap to the day-to-day work of the family physicians and of the primary healthcare team as well. The scope of Family Medicine is boundless and no book can attempt to provide adequate coverage of all aspects of the discipline. This book will be particularly helpful to medical students, young doctors entering family medicine and to anyone who provides primary health care.

We believe that this book will be your companion, providing you with the essential tools to tackle your daily practice in a very professional manner. This book also provides medical students, family medicine residents, general practitioners and certified family physicians with important general principles about clinical methods in its broadest

sense, in addition to the most essential information about common problems.

This book is divided into the following parts:
Part I: Principles of Family Medicine.
Part II: Anticipatory Care.
Part III: Approach to Common Health Problems.
Part IV: Important related Topics.
Part V: Appendices

Within each part there are a number of related topics, each topic is written with an approach that starts with a definition and differential diagnosis, which is then quickly narrowed through a series of steps of decisions making process. It will help the family physicians quickly to organize a strategy for approaching their patients using the bio-psycho-social model.

In keeping with our goal and to make this book as friendly as possible, at the end there is a list of references which can be referred for further information.

We look forward receiving your comments regarding our efforts. Please e-mail us your questions, comments, or suggestions at the following address:
gelban@gmail.com

Abha, Kingdom of Saudi Arabia 2009

Khalid, Yahia and Mohammad

Acknowledgements

We greatly acknowledge our residents and medical students who have received and criticised the contents of this book over the years. Our colleagues in Family Medicine deserve our thanks for their encouragement and guidance especially Prof. Mohd. Yunus Khan for reviewing this book. Finally the greatest thanks go to Mr. Allan Agaton who has worked tirelessly and cheerfully and has coped with substantial rewrites without complaints.

Authors

Contents

Part I

Principles of Family Medicine

Part I

Principles of Family Medicine

Contents

1. Principles of Family Medicine

What is Family Medicine?

"It is the medical specialty which provides continuing and comprehensive health care for the individual and the family. In breadth it is the specialty which integrates the biological, clinical and behavioral sciences. The scope of Family practice encompasses all ages, sexes, each organ system and every disease entity". *(American academy of Family Physicians).*

"The family physician is the specialist trained to work in the front line of health care system and to take the initial steps to provide care for any health problem(s) that patient may have" *(Olesen Definition -2006)*

Although the abovementioned definition is the most widely accepted worldwide, however a lot of confusion has existed inside and outside the specialty due to the use of different terms when referring to "Family Medicine" e.g. Family Practice, General Practice, Primary Care and Family Medicine. Therefore, these terms will be clarified as follows:

Family Medicine:
It is a wider term including the family practice in addition to the academic part of the discipline, this term is being used in universities and academic centers.

Family Practice:
This term is used to indicate the service part which gives a low weight to the core knowledge but emphasizes its practical aspect. It shared knowledge and skills with other specialities. However, the process in family practice is unique.

Family practice includes:

- Diagnosis of health problems.
- Management of acute and chronic health problems.
- Health promotion.

- Health education.
- Health maintenance.
- Disease prevention.
- Counseling.
- Home care.

General Practice:
In many countries such as Saudi Arabia the "General Practitioner" is the Physician who practices in the Primary Health Care Centers without having a postgraduate training in family medicine while it means the Family Physician in other countries such as the United Kingdom and Australia.

Primary Care:
It is the level of care or setting (not a specialty) through which a person has the first contact with health care system. This can be an emergency department, Primary health care centers or even the out-patient clinics of the hospitals. The care at this level can be provided by the General Practitioner, Family Physician, Internist, and Pediatrician or even by the sub-specialized physician provided; it is the first contact or point of entry to the health care system. This term is used frequently and wrongly as an equivalent term to family medicine.

Misconceptions about the nature of Family Medicine:

Myth 1. It is a melting together of the major clinical specialties and nothing new in this specialty .Usually this myth created by colleagues from other specialties.

Myth 2. It is a new specialty which is specialized in family; this is created by Family Physician sometimes to resolve their identity under the pressure of misunderstanding by specialist colleagues.

History of Family Medicine:

The term "general practitioner" was first mentioned by Lancet in 1823.

- In the two decades following World War II, the number of specialists and sub specialists increased dramaticaaly, while number of general physicians declined
- In 1923, Dr. Francis Peabody (Professor of Medicine at Harvard) called for a rapid return of the general physician who would give comprehensive care.
- In 1960, the specialty of family medicine was created based on three important committee reports recommendations in USA.
- American Academy of General Practice was founded in 1947, and first residency training program was started in 1950.
- In 1969, The American Board of Family Medicine was formed and family medicine was recognized as the 20th American medical specialty
- In UK, the Royal college of General Practitioner was founded in 1952
- In 1972, the World Organization of Family Doctors (WONCA) which is made up of national colleges or organizations concerned with academic aspects of family medicine was founded .It has over two million family physicians /general practitioners.
- Today, family physicians constitute the fundamental core of the health system in Canada, Australia, New Zealand, Netherlands, UK, Cuba and Spain. The specialty is active in South Korea, Hong Kong, Singapore, Indonesia, Taiwan, Philippines, Bangladesh, and Pakistan.
- In Saudi Arabia, "a family physician for each family program" has been launched. However, its success needs ideological and financial support from the government and the community.
- In Saudi Arabia, There are two training programs; the Saudi Certificate (Board) in Family Medicine (SSC-FM) and the Saudi Diploma in Family Medicine which graduate around 50 family physicians per year.

Principles of Family Medicine:

Family Medicine has its principles on which it is based. These principles reflect its philosophy. The five important principles of family medicine are:

1. The family physician is a skilled clinician

   This requires solid knowledge and varied skills in diagnosis and management of a wide range of clinical problems encountered in the daily practice. Family physicians view their patients from biological, psychological, spiritual and social dimensions during the diagnosis and management of the different health problems. They look after their patients without considering their ages, sexes and body organs or systems involved.

Skills are needed during

- Diagnosis
- Drug prescribing
- Counseling
- Office procedures
- Palliative care

2. The doctor-patient relationship is central

   This includes giving the priority to the patient agenda to explore his/her experience of being patient by focusing on his/her ideas, concern and, expectations. This also includes the concepts of patients, family and society. Family physicians have good skills in using the family resources in order to care for any individual who suffers from any health problem. Family cares for a child with bronchial asthma or elderly sufferings from coronary heart disease are just examples of involvement of family in health care of their members.

3. Family Medicine is a community based discipline

   Family practitioners see their patients during health and illness. Family physicians are responsible for offering preventive care to all family members during their various stages of life. Immunization, periodic health examination and health education are examples of preventive measures in family practice. Patients can be seen by the family physician in the office, clinic, hospital or home

presenting with problems that are usually undifferentiated and are influenced by community factors. These problems could be acute, life threatening, chronic or psychosocial.

Skills required:

- Basic knowledge of community medicine
- Practicing preventive medicine
- Dealing with occupational and environmental diseases
- Practicing screening in the office setting

4. The Family Physician as a resource to the practice

   Family physicians can not carry out their tasks in isolation of the community. They deal with individuals in the context of family and with families in the context of community. They use the community resources to carry out many programs such as health education and health promotion. This requires using the knowledge and skills in research and literature review to evaluate, improve and to organize the practice to ensure the health of the population which is maintained with or without attending the clinic.

The skills needed include:

- Continuous Medical Education (CME) programs
- Clinical Auditing
- Conducting epidemiological clinical studies
- Practicing Evidence Based Medicine

5. Family physician is a care Co-coordinator:

   Family physician acts as a coordinator who can refer the patients to the appropriate consultant, and coordinates the different health services in accordance with the needs of his/her patients.

Setting of Family Medicine

Family medicine can be practiced in the following settings:

1. Primary Health Care Centers

a. Definition of Primary Health Care (Declaration of Alma-Ata-WHO, 1978)

"Primary health care is the essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain health at every stage of their development in the spirit of self-reliance and self-determination. It forms an integral part both of the country's health system of which it is the central function and main focus, and of the overall social and economic development of the community. It is the first contact of individuals, the family and community with the national health system bringing health care as close as possible to where people live and work, and constitutes the first element of a continuing health care process"

b. Primary Health Care Principles

1. **Equity in distribution**: essential services to all but more to the needy.
2. **Appropriate technology:** Scientifically sound, culturally and economically acceptable by people and health providers.
3. **Multi-sectorial approach**: All related sectors e.g. agriculture, industry, education, etc. should be involved in the development of PHC.
4. **Community participation:** community and individual participation in the planning, organization and operation of the PHC are essential.

c. Elements of PHC

1. **Health Promotion**
   - Health education
   - Promotion of food supply and proper nutrition
   - Maternal and child health

2. **Disease Prevention**
   - Immunization
   - Prevention and control of endemic disease
   - Provision of safe water and basic sanitation

3. **Curative**
   - Treatment of common diseases and injuries
   - Essential drug provision
   -

4. **Rehabilitation**

1. **Hospitals: Secondary and tertiary care**

2. **Specialized hospitals**

3. **Emergency departments**

4. **Satellite settings**

5. **Private clinics**

6. **Care on demand**

2. The "Family" in Family Medicine

Introduction:

Family physicians are responsible for introducing promotive, preventive, curative and rehabilitative services to all family members from birth to death. All these types of care can not be introduced in good quality without knowing the family, its functions, types, sources and dynamics in real life.

Definition:

"Family" is defined as the functional and structural unit of the society. It is defined as two related or more individuals living together. Those two persons could be the wife and husband, mother and her child, father and his son or daughter.

Types of families:

According to structure of family, there are two main types of family:

1. **Nuclear family**: This consists of the couple and their children only.

2. **Extended family**: This consists of couple, children and other relatives like maternal uncle, ante, etc. but excluding grandmother, grandfather and brothers.

Characteristics of family:

Generally, families share many characteristics, which include:

- Living in the same house.
- Sharing the same values.
- Sharing similar social activities.
- Sharing similar objectives in their lives.
- Sharing sense of responsibility towards society.

Roles & functions of the family:

The family plays important roles and carry out many tasks and functions in the community during health or illness. Common functions of family include:

- Helping each member of family to acquire social skills (Socialization).
- Provide fundamental care to every member such as food, shelter (Care).
- Provide psychological care such as love and warmth (Affection).
- Maintain essence of family through legal sexual contact (reproduction).
- Helping each member to decide his future career regarding education and occupation (Providing Status)

Role of the family in health and illnesses:

The Family can maintain its member healthy and well, it can contribute significantly in prevention of diseases through the following:

- By providing the good housing conditions.
- By providing adequate and healthy food.
- By providing pure and clean water for drinking and washing.
- By utilizing preventive measures such as immunization, periodic health examination, health screening.

During sickness, the family can help its members by many means:

- Taking the sick individual to the nearest health facility for treatment.
- Helping the patient to comply with medical advice.
- Providing psychological support in crisis situations.

The family can be a source of diseases and health problems throgh:

- Transmission of genetic disorders.
- Transmission of communicable diseases.
- Acquiring bad habits such as smoking, drug abuse and eating habits leading to occurrence of conditions such as obesity, hyperlipidemia, cancers and psychiatric disorders.

Family Cycle:

The family passes through eight known stages. Each stage reflects the dominant function of the family at that stage.

1. Stage-I: This stage is known as courtship: It precedes the marriage (Khotoba). It usually takes less than one year in Saudi community. During this period it is not allowed for both individuals to practice sex. Each one of them lives with his family.

2. Stage-II: This stage is known as marriage (Zawaj): This stage starts with the first sexual contact and ends with the birth of the first child. In our community, this stage usually takes less than two years.

3. Stage-III: Child bearing stage: This stage starts from the birth of the first child and continues till the birth of the last child. This stage in Saudi family takes about 20-25 years.

4. Stage-IV: Child rearing stage: This stage starts as the last child born and ends when the first child leaves home.

5. Stage- V: Child launching: This stage starts when the first child leaves home till the last child leaves home. i.e. the interval between the leaving of first and last child.

6. Stage-VI: Empty nest: In this stage, only the couple is left without children. This stage extends from the leaving of the last child till retirement.

7. Stage-VII: Retirement: This stage starts with the leaving of official work usually between 60-65 years till death.

8. Stage-VIII Grieving stage: This stage begins with the death of one member of the couple.

Family Dynamics:

The changes and the forces that produce activities in family are known as family dynamics .These forces could be physical, emotional, spiritual and intellectual.
Growth, development, organization, communication and adaptation are considered important issues in family dynamics.

Family dynamics is affected by the major and minor events that occur in day –to-day life. These events may cause more or less stress in life. Death and divorce are the two examples of major stress while sexual difficulty and illness tend to cause moderate stress on family. Change of residence and sleep disturbance are examples of m stress on family.

Family Pedigree:

Family structure could be simply shown as pedigree or family tree .This simple illustration could be an important source of information about family. Family tree can provide us with the desired information such as:

- Names and age of each member of family.
- Type of family (nuclear or extended).
- Death of family members and the cause of death.
- Marital status of the parents (divorced, separated).
- Pattern of diseases and habits in family (genetic, familial diseases, smoking).

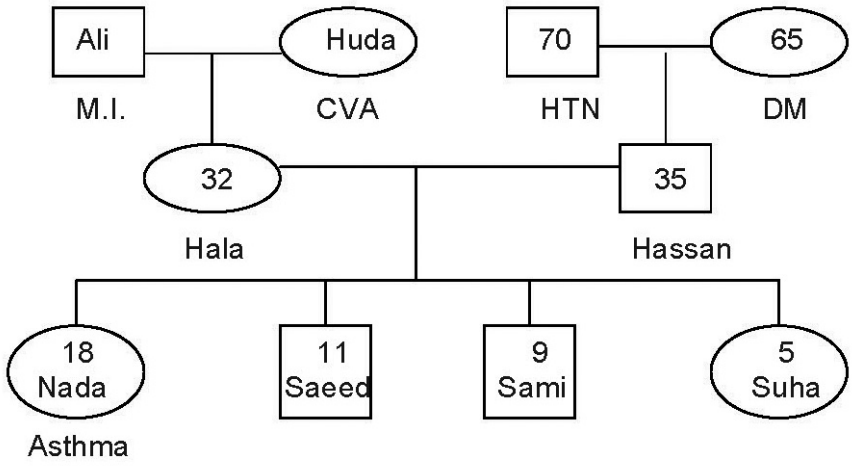


Figure 1. Hassan Genogram

The "Family" in Saudi Arabia:

According to the Family Health Survey in Saudi Arabia conducted by Khoja et al in 1996G, the following information is available:

- Average size of Saudi family is seven.
- About half of the members of Saudi family are below 15 years.
- More than two-fifths of the Saudi females are in the childbearing age (14-49 years).
- About 9% of Saudis above 15 years old are smokers.
- Marriage between relatives (consanguinity) is about 52%.
- Marrying two wives is common in Saudi Arabia (19%).
- About 85% of Saudi Families own a car.

3. Medical Ethics

Definition:

It is the discipline that examines and attempts to resolve the moral problems relating to health care, health care institutions, and biomedical research.

Sources:

1. **Theology**: provide judgment to proper action depending on religious resources.

2. **philosophy:** provide judgments depending on studying moral life and analyzing of options of possible ethical decisions

Importance:

Every contact between a patient and a health professional contains moral dimensions which must be considered and respected.

Rationale:

In the seventies of the 20th century, the importance of medical ethics as an academic and professional discipline was realized; this could be related to the following:

1. Introduction of the new medical technology like life support equipments, genetic screening etc.
2. Emergence of the new techniques in the medical field such as organ transplantation.
3. Increased respect of patients right globally.
4. Social concerns regarding the possibility of human abuse in medical research.
5. Unreasonable sharp increase in the cost of health services.
6. Increase financial restrains

7. Increases health care professionals concerns about the mortality of their professions
8. Increases moral questions in medical field when conflict appears among physicians, values, physician loyalty to his work, patients' values and community values.

The basic principles of medical ethics:

1. ***Beneficence***: (Do the most positive good):
   The health professionals have the responsibility to do good for his patient and for the whole community. Beneficence is doing all your efforts to improve the health of the whole community by helping each individual patient.

2. ***Non-maleficence*** (Do not harm):
   This is one of the oldest principles of medical ethics. Generally, it is not permissible to harm another person except under very limited concepts of self- defense. In medicine; harm is permissible if it is needed to help, heal or to cure the patients' e.g. surgical incision, breaking confidentiality etc. Therefore, harm is permissible if benefits can justify your action.

3. ***Justice*** (Be fair):
   To be fair in distributing benefits and burdens when provide services or deal with people by considering the following:

   a. **Rules and regulations justice:** to be fair in building and implementing of rules and regulations e.g. distribution of services on the base of "first come, first serve"

   b. **Distributive justice:** equal sharing of services is not always the fairness. When you have limited resources, you should have a good justification in your decision "who will have health care and who will not?)

   c. **Individual and community Justice:** sometimes there is a conflict between patient and society rights. Health professionals should balance between his primary

responsibility towards his patient and obligations to the community.

4. ***Respect for autonomy***: Respect wishes of the people that include:

   a. Confidentiality: by implementing the following general guidelines:

i. Limiting access to patient data only to those who have legitimate need
ii. Avoiding conversations about patients.
iii. Using false names when presenting cases in conferences and in teaching

   b. Truth-telling: patients have the right to know the truth about their conditions.

   c. Decision making: patients' desires and needs should be respected when decisions are taking by sharing any decision with him.

   d. **Respect for individuals:** Illness usually weakens patients' independence. Therefore, it is necessary for him to be helped to practice his autonomy.

   e. **Informed consent:** It should be obtained before performing any procedure.

   It indicates the following:

   i. The right of competent person to make a decision to permit or refuse a treatment based on relevant information.
   ii. This right requires from health professionals to provide relevant information in a clear manner. to the patient.

Ethical issues in daily practice:

- Ethics is part of daily medical care i.e. you need to have high ethical standards in your practice not only in special circumstances

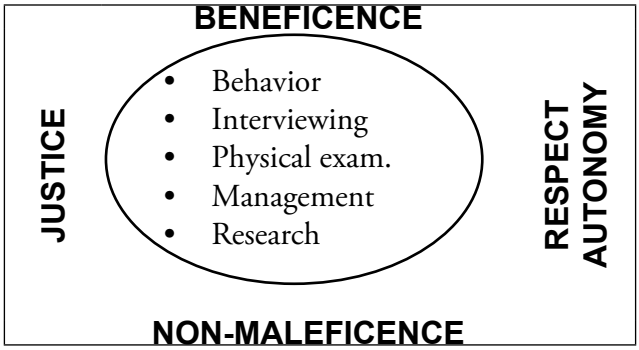


Fig. 2: Ethics in daily practice

American medical Association (AMA) principles of medical ethics:

i. A physician shall be dedicated to providing competent medical care, which compassion and respect for human dignity and rights.
ii. A physician shall uphold the standards of professionalism, be honest, in all professional interactions.
iii. A physician shall respect the low and recognize a responsibility to seek changes in those requirements, which are contrary to the best interest of the patient.
iv. A physician shall respect the rights of patients, colleagues, and other health professionals.
v. A physician shall continue to study, apply, and advance scientific knowledge, maintain a commitment to medical education, make relevant information available to patients, colleagues, and public, obtain consultations, and use the talents of other health professionals when indicated.
vi. A physician shall recognize a responsibility to participate in activities contributing to the improvement of the community.
vii. A physician shall support access to medical care for all people.

Analysis of an ethical problem:

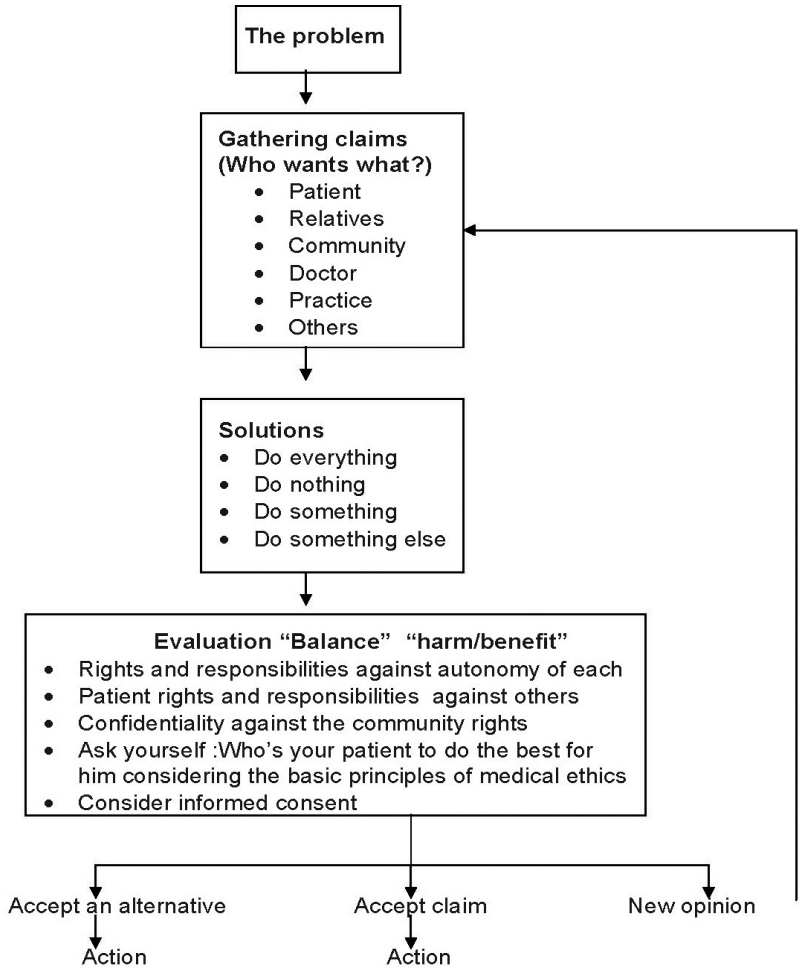


Fig. 3: Analysis of an ethical problem

4. Clinical Approach in Family Medicine

The approach and the caring for patients by family physicians require a different emphasis in skills and attitudes than the one used in hospital –based care because, family physicians provide a wide spectrum of care, which includes anticipatory care,symptomatic care, therapeutic care and palliative care to all ages, both sexes, at many sites in beside their offices.

A. Problem solving process

I. Inductive Reasoning Method:

This is the classical method which is taught in medical schools when approaching a patient which is:

1. **Doctor-centered** approach in which, the physician tries to accomplish his own agenda including:
   History of presenting illness
   Full symptoms enquiry
   Past medical, drug, family and social history
   Complete physical examination
   Extensive laboratory investigations
   Diagnosis of a specific disease

2. **Disease-Oriented** approach in which the physician is concerned about the diagnosis not the total patient as a human being through:
   - Biomedical approach that aims to diagnose or exclude organic diseases.
   - Managing a specific disease

Limitations of the Inductive Reasoning Method:

This method could be acceptable at the undergraduate level aiming for learning a wide range of questions and maneuvers in clinical examination. However, it can raise problems for family physician because of the following:

a. The undifferentiated nature of the presenting problem: No specific diagnosis can be found in 50% of family medicine consultations because of early presentation, multiple problems and frequent interaction of physical, emotional and social factors.

b. Inductive method forces physician to interpret the presenting symptoms and signs in terms of specific disease which may lead to misdiagnosis or over-diagnosis, which in turn may lead to increase stress, anxiety and un-necessary cost.

c. This method pushes the physician to ask questions and not to listen actively to his patient (Doctor - centered).

d. This method might be suitable in hospitals, but it is difficult to apply in family medicine due to different probabilities, prevalence, distributions and the setting

II. Hypothetical-deductive method:

Recent studies support the suggestion that physician should formulate his/her hypothesis early in the consultation based on verbal and non-verbal clues, previous experiences, and patient medical record and patient and family contexts. This lead to a more pragmatic approach known as ***hypothetical-deductive method*** **as shown below:**

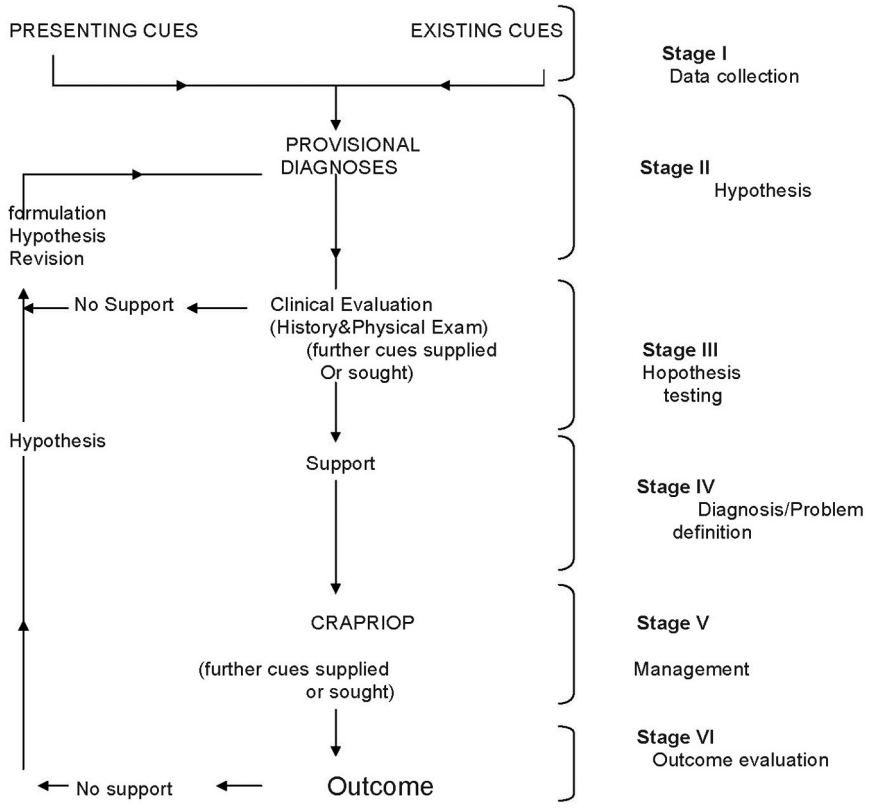


Fig. 4: Model of Hypothetical-deductive method of problem-solving

Stage I. Data Collection and Analysis of presenting and existing cues

Sources of cues: physician can get clues to rule in or rule out a diagnosis from.

1. The patient
2. The relatives or other significant members (friends, neighbours)
3. Medical records
4. Other sources

Types of cues: cues can be in form of:

- **Symptoms**: indicate and support a specific diagnosis.

- **Body language**: can express the patient's feeling
- **Age**: some diseases are more common in people in a certain age.
- **Ethnic origin** some diseases are more prevalent in people from a specific region or from a defined ethnicity.
- **Thin/thick records**: This might indicate that this patient has acute or chronic problem accordingly.
- **Subjective:** Physician's feelings which explicitly or implicitly reflect his experience.

Weighing of cues: the role of a cue in diagnosis depends on the following factors:

- **Significance**: e.g. patient with chest pain and history of ischaemic heart disease risk factors has a significant risk to have Myocardial Ischaemic diseases.
- **Pattern:** e.g. Migrating arthralgia might indicate Rheumatoid arthritis
- **Seriousness:** usually give high priority to rule out serious possibility e.g. if suspicion of meningitis comes to your mind you have to exclude it first, because of its seriousness and implications.
- **Probability:** by putting all of the above together you can classify your differential diagnosis as: most likely or less likely.

Role of physician at this stage: To be able to:

Identify all patient problems
Identify the context of the problems
Understand the patient as a whole

Stage II. Hypothesis Formulation and Developing Professional Diagnosis

- It is recommended to formulate 5-7 hypotheses at the beginning of consultation and then refine them.
- As the consultation proceeds, you may not find a support for the targeted hypothesis which should be revised.

- New ideas may be raised during consultation which needed to be tested.
- During this stage you should keep taking decisions based on your findings and in the light of the following table:

Patient Agenda	**Understanding illness and patient**	**Doctor-patient relationship**	**Understanding the disease**	**Doctor agenda**
Why this patient has come? What are the ideas, concerns, expectations? Hidden agenda?	What is patient actually complaining of? Who or what sort of person is this? How does this affect the illness, compliance and our relationship	What can be done to maximize the therapeutic relationship?	What sense can be made in the light of my understanding of disease and their management?	What do I need to do?

Table 1. The stages of developing provisional diagnosis

Stage III. Hypothesis Testing

Further information is needed by taking history and doing physical examination to rule in or rule out the initial hypothesis. The family physician should make a working diagnosis, in biological, psychological and social terms taking the following in to consideration:

1. Verbal and non-verbal cues that the patient gives or offers
2. Best hypothesis (working diagnosis)
3. Evidence for and against each working diagnosis.
4. Select diagnostic "tests" on two bases:
   a. Specificity and sensitivity
   b. Efficacy, safety and cost

Stage IV. Diagnosis (Problem definition)

It is not always possible to have a definite diagnosis, hence you have to learn how to live with uncertainty in family medicine by stating the

patient's problem in physical, psychological and social terms (biopsychosocial diagnosis)

Stage V. Management options

According to the previous series of decisions you can manage your patient (Not the disease) using **CRAPRIOP** acronyms as following:

C: ***Clarify*** the diagnosis to the patient; its causes, prognosis, available treatment complications.

R: ***Reassure*** the patient properly e.g. reassure the patient that he will receive the best available service. It is not necessary to reassure him that his condition is not serious.

A: ***Advise the patient:*** regarding modification of his life style to promote his health and to prevent expected complication of the problem.

P: ***Prescribe*** appropriate pharmacological or non pharmacological treatment

R: ***Refer*** appropriately when indicated.

I: ***Investigate*** the patient to confirm the diagnosis or for purpose of follow up for any expected disease progression, complication or drug side effects.

O: ***Observe*** (follow up): according to the condition.

P: ***Prevent*** further deterioration and promote the patient's health in general.

StageVI. Outcome Evaluation:

The Diagnosis: Physician should check if the outcome of his management support the working diagnosis or there is a need to revise his hypothesis.

The physician: as a physician you have to take care of yourself in form of:

a. housekeeping especially after difficult consultation
b. self updating

The setting: by doing regular clinical auditing of the center/ clinic.

B. Consultation

Definition

Most textbooks describe patient interviewing as a diagnostic procedure which is a systematic process of data-gathering designed to identify problems and to arrive at a conclusion, leading ultimately to treatment plan. This is only partly true. To achieve its maximum value, the consultation should be therapeutic as well as diagnostic. The most important skill of family physician is ability to interview patient effectively based on the responsibilities of family physician which have been defined by the world Federation of Family Physicians as follow:

1. To provide health care to all patients, regardless of their age, sex, socio-economic standing and disease status.

2. To treat diseases and promote healthy lifestyles in individuals and communities.

3. To provide comprehensive, continuous care, bearing in mind the cultural, social, psychological and economic factors that influence health and disease.

4. To provide care either directly or through other members of the team, depending on the needs of the patient and the resources of the community.

Models of Consultation

Over the years the scientists have studied the consultation and the following are but some of the models proposed

Models of Consultation

1. Bio-medical model (Hospital model).
2. Bio-psychosocial model.
3. Byrne and Long model (doctors styles)
4. Balint model.
5. Pendelton model.
6. Stott and Davis model
7. Neighbour model.

1 & 2. The first 2 models are the Hospital model versus the Bio-psychosocial model which have been compared earlier in this chapter.

3. Byrne & long model (Doctors styles)
It provides the main skills to conduct successful patient-centered consultation versus doctor-centered consultation.

Style I. The most extreme doctor-centered: Doctor decides for the patient and instructs him/her to take the medicines.

Example: Well now, take this to the pharmacist; take the drug three times daily after meals, bye.

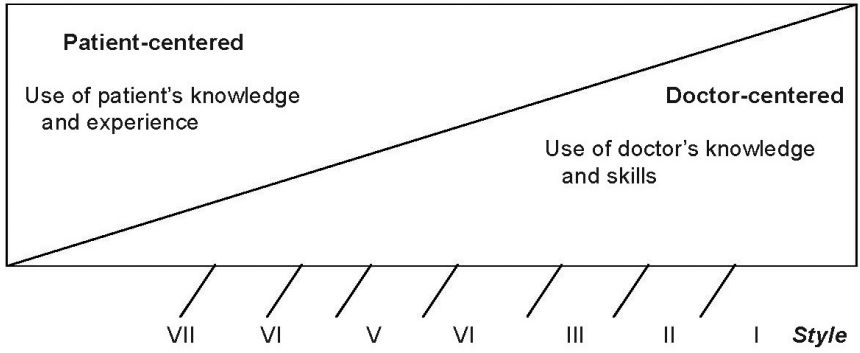


Fig. 5: Doctor's Styles in Consultation

Style II. The doctor makes his/her decision and announces it:

Example: Well! Now, you seem to have X diagnosis.
In this style, doctor does the following:
- Gives information to the patient
- Direct him/her
- Terminate the consultation

Style III. The doctor sells his decision to the patients:

Example: Well! now, you seem to have X diagnosis. I would like you to take this to the pharmacist … How do you feel about that?!
In this style, doctor does the following:
- Gives information to the patient
- Direct the patient
- Gives reasoning to the patient
- Seeks patient ideas (but not using them)
- Direct termination of the consultation

Style IV. The doctor presents a tentative decision subject to change.

Style V. The doctor presents the problem seeks suggestions and make a decision

Style VI. The doctor defines the limits and requests the patient to make a decision.

Style VII. The doctor permits the patient to make his own decision.

4. Balint Model

1. "The doctor as a drug"

Doctor can be therapeutic if he/she uses his expertise for reassurance. On the other hand, he can be toxic if use high doses to make patient depend on him

2. "***Elimination by physical examination"***
Physical symptoms need physical examination, as well as the assessment of psychological symptoms. Inappropriate physical examination and repeated investigations may reinforce the patient's ideas that his symptoms are physical ones whereas in fact they might be neurotic in origin.

3. "The child as a presenting complaint"
The patient might offer his/her child as an entry ticket whereas he/she might have a marital or sexual problem.

4. "Inappropriate referral (Collision of Anonymity)"
Inappropriate referral to avoid psychosocial problems dilutes the responsibility where no body takes ultimate responsibility.

5. "The Mutual Investment Company"
The patient presents" offers' his, physical or psychological problems to the doctor, while the doctor is rejecting them by stating "nothing is wrong" or "quick reassurance" which leads usually to the failure of consultation.

6. "The Flash" The transparence and counter-transparence
The point at which the doctor and the patient feel the real reason, the patient "offers" with appropriate response.

5. Pendleton Model

Pendleton has classified the consultation into seven steps:

1. To define the real reason for attendance
2. To consider other problems
3. To choose "with the patient" the appropriate action for each problem
4. To achieve a share of understanding
5. To involve the patient in the management
6. To use time and resources effectively
7. To establish and maintain doctor-patient relationship

6. Stott and Davis Model (The expanded model)

Besides dealing with the patient presenting problems, they expand the consultation to 3 other functions:

1. Management of ***presenting problem***.
2. Management of ***continuous problems***.
3. Modification of help ***seeking behaviour***
4. Opportunistic health ***promotion***

7. Neighbour Model

1. Connecting (establish a relationship)
2. Summarizing (Physical, psycho. and social diagnosis)
3. Handing-over (management of presenting problem
4. Safety-netting (anticipating care)
5. House-keeping (taking care of yourself)

Difficult Consultations

Around (10% - 20%) of daily consultations are difficult. These difficulties are either due to:

1. Difficult patient
2. Difficult doctor
3. Difficult communication between the doctor and the patient.
4. Difficult environment

1. ***Difficult patient*** can be:

    1. Psychotic patient, suicidal patient etc.
    2. Depressive patient
    3. Psycho motor, summarizing, psychosomatic patient.
    4. The talkative patient
    5. Patient who is difficult to talk and withdrawn
    6. Bereaved patient
    7. Angry patient
    8. VIP patient
    9. Others (demanding, manipulative, etc.)

2. ***Difficult doctor*** can be:

    1. Doctor in a hurry
    2. Authoritarian doctor
    3. Passive (?? Submissive) doctor
    4. Angry doctor
    5. Alien doctor (from different culture)
    6. Doctor who have psychological or social problems

3. ***Difficult communications***

    1. Language difficulties
    2. Social class differences
    3. failed consultation due to different reason

4. ***Difficult environment***

    1. Crowded clinic
    2. Poor organization.

C. Communication Skills

Interpersonal Skills:

- Introduce yourself to the patient warmly; shake hands.
- Acknowledge emotions patient is showing, and then discuss the emotion, i.e., "You seem sad".

- Don't give the patient more information than he/she can handle.
- Demonstrate empathy when appropriate.
- Demonstrate an attitude of confidence, reliability and warmth.
- Seek the patient's point of view; inquire about any concerns the patient may have.
- Never be judgmental or confrontational with a difficult patient.
- Establish a partnership with the patient; i.e., "We'll work together to make you better".
- Do not give the patient false reassurance.
- Praise the patient, i.e. "You are coping very well with this illness".
- Provide the patient with pamphlet.

During history taking:

- Use open ended questions i.e., "What is troubling you?" "Can you tell me about your symptoms?"
- Use pauses; give the patient time to think and react.
- Never interrupt the patient when he/she is speaking.
- Go smoothly from one part of discussion to another.
- Use listening techniques like good eye contact, an open (arms uncrossed) leaning forward posture at eye level.
- Repeat last statements made by the patient so he/she will continue speaking.
- Use plain, understandable language.
- Do not be in a rush; let the patient answer a question before you ask another question.
- Be open to questions, never avoid or ignore a question.
- Show interest in the patient's story; never act bored.

***During examination*:**

- Wash your hands in front of the patient.
- Do not examine the patient through the gown but ask the patient to undress as much as possible.

- Ask the patient for permission prior touching him/her or removing clothing.
- Tell the patient what you plan to do.
- Explain your physical examination findings.
- Be sensitive to the patient's pain, suffering and discomfort.
- Never begin a discussion while the patient is partially undressed
- Never repeat painful maneuvers
- Help the patient on and off the examination table.

***Common communication challenges**:*

Delivering bad news to a patient	• Abnormal mammogram or pap smear • Positive HIV test • Recently diagnosed cancer or Alzheimer's disease
The patient who decides to refuse treatment	• Patient refuses life-saving surgery, blood transfusion, intubation, resuscitation or feeding • Patient requests removal of life support devices
The patient's right to be informed	• The patient has the right to know the truth about his/her disease and its prognosis • Make sure the patient understands the illness and the need for medication

The non-compliant patient	• Educate the patient about his/her condition and discuss the reasons for non-compliance
The battered patient	• May be spousal, elder or child abuse • Carefully obtain a history of violence, note bruises, or evidence of trauma.
The patient's right to confidentiality	• Respect the confidentiality of the patient-physician relationship
The over-talkative patient	• If the patient is manic or hippomanic tactfully interrupt and use close-ended style of questioning. • Avoid becoming impatient or frustrated.
The alcoholic patient	• Address the alcohol abuse issue in a non-judgmental and non-confrontational manner • Integrate the ***CAGE*** questionnaire into the interview (Table 2)
The substance addicted patient	• Offer detoxification choices • State that you will treat withdrawal symptoms • Control your own biases

The smoker	• Discuss strategies to quit smoking
The patient with special emotional problems	• The hostile or anxious patient • Address the patient's concerns
Obtaining informed consent	• Explain the indication, risks, benefits, and possible complications using plain and concise language.

No.	Acronym	Question
1	C	Have you ever tried to *cut down* your drinking?
2	A	Have you ever been *angry/annoyed* when people ask about your drinking?
3	G	Have you ever felt *guilty* about your drinking?
4	E	Have you ever had an *eye-opener* (drinking on waking up in the morning?)

Table 2. CAGE Questionnaire

D. Innovative Model for Consultation

This model has been designed based on known consultation models mentioned earlier in this chapter, in addition to literature review and personal experience.

Part I: Gateway Information(Presenting and existing cue**s**)			**Part VI: Time Management**	**Notes**
Part II: Interviewing				
1. ***Rapport***	1. **Greet**	(Patient and his accompanied, person)		
	2. **Introduce**	your name and position		
	3. **Confirm**	Patient name, age, and job		
2. ***History***	1. **C. C.**	To be elaborated fully by the Patient		
	2. **HPI**	Explore symptoms and their characteristics		
		Screen system involved e.g. GI		
		Differential diagnosis		
		Risk Factors: General/specific		
		Look for expected complications		
	3. **PMH**	Medical & Surgical		
	4. **FH**	Similar problem, other		
	5. **Drug**	treatment, abuse (side effects, cost & compliance)		
	6. **Lifestyle**	Diet, exercise, stress, smoking, alcohol, hobbies, sex.		
	7. **Psychosocial**	ICEE (Idea, concerns, expectations, effects		
		Psyche: Depressive, anxiety, stress		
		Social: Work, home, family, friends		
		Support system: agencies, relatives, friends, etc.		
	8. **Hidden!**			
3. ***Summarize/feedback***				
Part III: Physical Examination				
	1. ***Permission & Hand wash***			
	2. ***Explain***: .	*to the patient what will you do*		
	3. ***Related organ***	*(look for DDx, Risk factors or Complications)*		
	4. ***Summarize/feedback***	*to your patient*		
Part IV: Management(All Problems)				
	1. ***Explain***	**Nature** Prevalence, **Prognosis** (! Bad news)		
	2. ***Partnership***			
	3. ***Plan*** **CRAPRIOP**	(DDx, Risk factors, Cx)		
	4. ***Request!***			
	5. ***Safety***			
	6. ***Help seeking***			
	7. ***Compliance***			
	8. ***Ending***	Summarize, feedback & Continuity of care		
Part V: Self management				

Pt: Patient, **C.C:** Chief Complaint **HPI**: History of presenting illness, PMH: Past Medical History,FH: Family History**.ICEE**: Idea Concern, expectation&effect **S/E:** side effects, **DDx**: differential diagnoses, **Cx**: complications**, Med**: Medical. **Surg**: Surgical

Table 3. The innovative consultation model

This model has been used in clinical practice and in board examinations for several years. It will be used as standard in this book (Hint: you can make enough copies and use it to guide you in every encounter with patient till you build up your own approach based on consultation models, hypothetical-deductive method and biospsycho-social approach)

The form designed for this model (table-3) is divided into two parts (left and right). The left side can be used as guidelines and the right as your personal notes. This will help you to develop your personal approach and "mental checklist". The model body is devided into five parts:

Part I Gateway Information
Part II Interviewing
Part III Physical Examination
Part IV Management
Part V Time Managemenet

Part I: Gateway information *(presenting and existing cues)*

This information can be found in patient's chart, from your observation or in the instructions posted outside the examination room (if you are in exam). You must deal with this information very carefully since they will guide your encounter. (These include: type of visit (new/ follow up) location of patient (home, telephone consultation, hospital, etc.). This also can include: Patient's chief complaint, reason for the visit, age, past medical history, occupation, etc.

By understanding this critical point you will be able to plan your strategy in the consultation and you can formulate the suitable mental checklist at the beginning of each consultation.

At this stage, you are able to:

1. Recognise and understand the presenting or existing cues.
2. Focus on the patient's problem(s)
3. Develop your mental checklist

Part II. Interviewing

1. Establishing rapport:

- Greet your patient warmly, by standing up, smiling and shaking hands (as and when appropriate).
- Greet and identify the accompanied persons (don't forget children!)
- Introduce yourself to the patient and accompanied including your name, title, etc.
- Confirm patient's name and the preferred name for the patient e.g. (Abu Ahmed), nickname for child (some children know only their nicknames)

2. History:

- **Clarify chief complaints**, you can get it from existing cues (e.g.patient's record) or given by patient. e.g. Abdominal pain. If you notice any clues just mention it e.g.: Abu Ahmed, you look unhappy!!
  At this stage you have to know: why the patient has come? This should be clear and accurate because the rest of the consultation is based on this step.

- **Differential diagnosis:**
  Make a list of possible diagnoses for each problem using the biopsychosocial model, taking help of using available data and keeping the probability and seriousness of the condition in your mind.

- **History of the presenting illness**

Clarify the characteristics of the chief complaints of patient by asking him open ended questions and by guiding the patient to highlight important areas including:

1. Onset and chronology
2. Location and radiation

3. Quality
4. Severity
5. Variation
6. Alleviation factors
7. Aggravating factors
8. Course
9. Interventions tried previously.
10. Associated symptoms

- ***Screen systems involved***: sometimes you may need to screen only one system and sometimes more than one. e.g. patient came with cough: you need to review respiratory, cardiovascular and partially gastro-intestinal systems. Table 4, shows some symptoms and signsyou may look for:

General	Weight loss, weight gain, fatigue, chills, night sweats, and overall general health.
Skin	Rashes, lumps, itching, dryness, hair changes, nail changes
Head	Headaches
Eyes	Double vision, blurred vision, eye redness, eye discharge, watery eyes, light bothers eyes, wear reading glasses, history of glaucoma or cataracts
Ear	Hearing loss, ringing in ears, room spinning, dizziness, infections, discharge
Nose	History of allergies and hay fever, frequent colds, nasal congestion, nasal bleeding, sinus problems
Mouth/Throat	Hoarseness, bleeding gums, mouth sores, bad teeth, sore tongue, taste disturbance, sore throat, trouble swallowing

Neck	Neck swelling (lymphadenopathy or goiter),neck pain or rigidity
Breasts	Nipple discharge, nipple inversion, bleeding nipple, asymmetry of the breasts, lumps, tender breast, monthly self-examination, last mammogram.
Respiratory	Cough, chest pain, wheezing, shortness of breath, dyspnea on exertion, bloody cough, history of tuberculosis (TB), pneumonia or asthma, last Chest X-ray.
Cardiac	Chest pain, pressure or tightness, palpitations, wakes up short of breath paroxysmal nocturnal dyspnea (PND), number of pillows slept on (orthopnea), shortness of breath, dyspnea on exertion, fainting, dizziness, feet swelling, history of angina, myocardial infarction, congestive heart failure, hypertension. High cholesterol level.
Gastrointestinal	Abdominal pain, indigestion, loss of appetite, weight change, food intolerance, difficulty in swallowing, painful swallowing, nausea, vomiting, constipation, diarrhoea, blood in stools, history of gall stones, pancriatitis, hepatitis, ulcer and hemorrhoids.
Urologic	Painful urination, frequent urination, blood in urine, cloudy urine, wake up at night to urinate (nocturia), trouble starting, holding or stopping urine, history of urinary tract infections (UTIs) or stones.
Genital (F)	Menarche, last menstrual period, number of pregnancies, miscarriages or abortions, menopause, hot flashes, vaginal discharge, vaginal itching, abnormal vaginal bleeding, menstrual cramps, change in menstrual pattern, history of sexually transmitted diseases, painful intercourse, last Pap smear.

Genital (M)	Discharge from penis, sores on penis, painful or swollen testicles, history of hernias, history of sexually transmitted diseases, problems with erections, impotence.
Rheumatologic	Back pain, joint pain, swollen joints, warm joints, joint deformities, muscle weakness, history of gout, osteoarthritis or rheumatoid arthritis.
Peripheral Vascular	Varicose veins, leg swelling, leg cramps, cold hands and feet, phlebitis, leg pain while walking (claudication).
Neurological	Headache, dizziness, weakness, numbness, fainting spells, problems with walking or coordination, room spinning (vertigo), tremors, problems with memory, problems with controlling urine (incontinence), history of seizures, paralysis or strokes
Psychiatric	Sadness, crying, irritability, nervousness, anxiety, fearfulness, hopelessness, sexual troubles, sleep disturbances, depression, hearing voices, thoughts about suicide, history of mental illness.
Hematological	Bruises, paleness, history of anemia or blood transfusion.
Endocrinologic	Excessive urination, hunger or thirst, tremors, weight change, fatigue, feeling hot or cold all the time (temperature intolerance), history of thyroid disease or diabetes mellitus.

Table 4: symptoms and signs to look for when screening patient.

Review of Risk factors

1. **General:** you have to ask about general risk factors in most of your patient (considering age & sex) e.g. smoking, Diabetes Millitus (D.M.), Hypertension etc.

2. **Specific:** risk factors related to the problem of your patient. e.g. if your patient has chest pain review risk factors for ischaemic heart disease: e.g. D.M., hypertension, smoking, lifestyle, hyperlipidemia, obesity, family history of ischaemic heart disease.

Complications

Possible complications of the concerned problem e.g. if you suspect D.M. in patient with polyurea; you need to check for complications of D.M. e.g. shortness of breath, orthopnea, paroxysmal nocturnal dyspnea, claudication, impotence, blurred vision, etc.

- **Past Medical History (PMH)**
  Divide it into:
  Past Medical History e.g. D.M., hypertension, asthma, admission for a medical problem, etc.
  Past Surgical History including operations, accidents, etc.

- **Family History (FH)**
  This can be divided into similar problems of what your patient has right now e.g. Bronchial asthma and other problems which can affect your patient directly or indirectly, physically, psychologically or socially.

- **Drug History**:
  You need to clarify the following:
  1. Medications the patient is on, including:
     - Name
     - Dose
     - Frequency
     - Cost
     - Side effects
     - Compliance
  2. Drug abuse:
     - Type
     - Duration

- Interventions tried previously to quit

Lifestyle:

Including the history of the following as appropriate

- **Diet**: according to the illness of the patient
- **Exercise**
- **Smoking**: if positive go in detail now or later as appropriate
- **Alcohol**: when positive use ***CAGE*** questionnaire
- **Hobbies**: especially when related to the presenting problems e.g. patient with cough having domestic animals
- **Stress**: in the patient's life
- **Sex behaviours**: when appropriate and indicated.

Psychosocial history

- **ICEE**: (***I***deas, ***C***oncerns, ***E***xpectations and ***E***ffects)

  Ideas: what is the believe of patient about his problem e.g. he might believe (think) that the reason behind his problem is the black magic.

  Concerns: the patient might think that he /she has a serious disease e.g. Cancer.

  Expectations: The patient**:** might want reassurance, referral or special investigations.

  Effects: it is important to explore the effect of the problem on the patient's job, family and social life.

Psychological history: Quick screening for depression, anxiety and stress (***DAS***) using the main criteria of *DSMIV* if positive you have to do it in detail

Social: Explore the social situation of your patient at:

Workplace

Home

With his family

With his friends
Check if there is some sort of supporting system specially when needed. e.g. Relative or agencies who can help

Hidden*:* to explore the hidden agenda that your patient may have. You can ask directly: Is there anything else you want me to discuss with you?

Briefing and feedback:

At the end of this section you need to give a summary of what you have got from your patient to make sure that you have understood him/her.
e.g. what I understood is that you were fairly well till… when you started to have this problem … etc…. Am I right?

Part III: Physical Examination

Permission: You have to take your patient's **permission** to do the examination.

Explanation: You cannot take permission (consent) of your patient without appropriate explanation of what you will do and why do you need to do so.

Related: your examination should be focused on chief complaint, utilize the data you have gathered from the history, keeping in your mind what are you looking for.

Examples: Rule in/rule out differential diagnosis
Look for risk factors to support your diagnosis
Look for signs of possible complications of the suspected condition

Summarizing: You have to explain to your patient what did you find in the examination in proper way.

Physical Examination findings that may be seen in a patient:

HEENT (Head, Eye and ENT)

- Hearing loss/visual loss
- Ptosis

Cardiovascular System

- Bruits (abdominal, carotid, renal, thyroid)
- Chest Pain – reproducible with palpation
- Hypotension/hypertension.
- Tachycardia/bradycardia

Respiratory System

- Airway obstruction
- Cheyne-Stroke respirations
- Cyanosis
- Diminished breath sounds/pneumothorax
- Hemoptysis
- Hoarseness
- Kussmaul respirations
- Shortness of breath/dyspnea / tachypnea
- Wheezing/strider

Gastrointestinal System

- Abdominal tenderness/rebound/guarding
- Breath odor of Diabetic Ketoacidosis (DKA)
- Caput medusa/fetor hepaticus
- Costovertebral-angle tenderness
- Cullen's sign/Turner's sign
- Melena/hematochezia
- Murphy's sign
- Psoas sign/obturator sign

Extremities

- Casts for fractures
- Deep venous thrombosis
- Joint restriction/joint immobility

- Joint warmth/joint erythema
- Pretibial myxedema

Psychiatry

- Anxiety/panic attack
- Anger/hostility
- Dementia/delirium/depression
- Hypomania/mania
- Altered mental status/confusion

Neurological System

- Dilated pupil/non-reactive pupil
- Alcohol intoxication/alcohol withdrawal signs
- Aphasia
- Ataxia/incoordination
- Babinski's sign/extensor plantar reflex
- Asterixis
- Brudzinski's sign/Kernig's sign
- Chorea
- Coma/unresponsiveness
- Decerebrate/decorticate rigidity
- Dizziness/vertigo
- Doll's Eye" response
- Dysarthria
- Facial nerve paralysis/Bell's palsy
- Gait abnormalities
- Hyperactive tendon reflexes/clonus
- Muscle rigidity/cogwheel rigidity
- Muscle spasms/spasticity
- Muscle weakness
- Nuchal rigidity
- Photophobia
- Romberg's sign
- Seizures
- Tinel's sign/Phalen's sign
- Tremor

Skin

- Allergic reaction/hives
- Bruising/ecchymosis/petechiae
- Burns
- Cellulitis
- Diaphoresis/perspiration
- Janeway lesions/Osler's nodes
- Jaundice
- Malar rash
- Palmar erythema
- Photosensitivity
- Rashes
- Skin track marks
- Spider telangiectasia
- Surgical scars
- Tophi

Part IV: Management

You need to manage your patient as a whole (biopsychosocial) i.e. you need to manage all his problems; physical, psychological or social, current or continous.

1. ***Explain***: You need to explain the condition to your patient in the language he/she can understand. Include the following:

    - *Nature* of the problem (what does this condition mean)
    - *Prevalence* in the community
    - Availablity of *treatment*
    - *Prognosis*
    - You may need to use proper skills to *break the news* (e.g. Diabetes Mellitus)

2. ***Partnership:*** Deal with your patient as a partner and behave with him/her as adult to adult i.e. work together to solve the problem.

3. Plan: Arrange with your patient the plan based on the acronym: **CRAPRIOP.**

C: ***Clarify***: Aiming to specify the diagnosis. Explain complication or risk factors and available treatment.

R: ***Reassurance:*** Realistic reassurance

- Reassure about the availability of treatment.
- Reassure him/her that you will give the best available care.
- Reassure him/her that you will be available when needed.

A: ***Advise:*** Regarding lifestyle modification and non-pharmacological therapy e.g. exercise, diet, habit, etc. aiming to involve the patient in order to solve the problems.

P: ***Prescribe:*** - Proper prescription
- Explain to patient:

- Why did you prescribe this medication
- When the patient can get benefit
- What are the expected side effects
- What are the precautions

R: ***Referral***

- Explain to your patient the aim of referral when indicated
- Explain to your patient the reason for refusing his request to be referred
- The clinic, center and the consultant to whom the patient is referred should be clear about the patient and of the referral form.
- The time of the appointment with the consultant should be clear to the patient
- The process of registration and attending the appointment should be explained to the patient.
- Patient should be encouraged for compliance with the appointment given.

- Referral (consultation) to the specialist should be clear, proper and professional.

***I: Investigation*s**:

Explain to your patient the following:

- What are the investigations needed?
- Where he can get them done?
- How
- When and
- Why should be explained to him?

O: ***Observation:*** (Follow-up)

You need to explain to the patient.
- Why he/she needs follow-up.
- When and
- How often

P: ***Plan/Prevention***

With your patient decide the next step in the management and if needed agree with him on emergency action plan e.g. what he should do if he has an acute attack of asthma.

Preventive measures that might be discussed with the patient as and when appropriate:

1. Alcohol, drug, and tobacco counseling
2. Cancer screening
    - Breast self-examination, mammography, and pap smear
    - Testicular and prostate examination
    - Fecal occult blood testing (FOBT)
    - Screening sigmoidoscopy
    - Skin examination
3. Infectious disease prevention

- Annual PPD (purified protein derivative) test
- Safe sexual practices
- Vaccinations (influenza, pneumococcal, hepatitis B, MMR, diphtheria, tetanus)

4. Proper diet and exercise
   a. To prevent heart disease, diabetes, cancer, hypertension, and osteoporosis
5. Methods of stress reduction (when necessary)
6. Environmental and occupational hazards (when appropriate)
7. Injury prevention
   - Using automobile seatbelts
   - Wearing helmets properly

4. Request:

Your patient may request you for something in the beginning of the consultation e.g. MRI for mechanical low back pain for which you don't have any evidence. However, you have to explain to the patient your own view (don't ignore the request of your patient!).

5. Safety:

Sometimes the condition under investigation can progress to a serious one or you may not certain about the condition, hence you need to give precautions to your patient e.g. if you develop so and so call me or come to the emergency room or when you take drug "X" don't drive your car and so on.

6. Help seeking:

Educate your patient how to ask or get help of health providers in an appropriate manner.

7. Compliance:

You ask your patient directly. What do you think about this plan? Do you think that you will comply with it?

8. Ending:

At the end of the consultation, you must achieve closure by summarizing the patient's problem, soliciting questions or concern. Remember to say "Maassalmah" "Goodbye" in an appropriate manner before your patient leave your clinic.

Part V: Self Management

Family physician should take care of himself in the following forms:

1. ***Housekeeping***:

   G***eneral***: by knowing how to manage his life and how to deal with stresses ***During consultation*****:** the **family** physician should know how to relieve himself especially after special consultations e.g. after breaking bad news, after seeing difficult patient etc. He also needs to manage his time or to manage accumulation of patients due to any reason.

2. ***Self development:*** the family physician need to update himself and be a continuous learner**.**

3. **Practice Improvement:** By practicing clinical audit with the participation of other members of the team.

Part VI: Time management

The family physician has to manage his time properly in each consultation, during the whole working day.
Remember that the suggested time to finish consultation in Saudi Arabia is about10 minutes which can be achieved by proper training.

E. Self assessment

You can develop your own self-assessment. Otherwise we provide you with form (table 5).You can make enough copies and use it at the end of each clinic to find out your strengths and weaknesses (always there is a space for improvement)

Case:			**Date:**	**Duration:** 10 minutes
Consultation	**Clear**	**Impaired**	**Absent**	**Grade**
Chart Review				
Interviewing Greet patient and other Introduce your self Put patient at ease Relationship with accompanied person Allow patient to elaborate the chief complaint fully Listen attentively Seek clarification if need Phrase question simply and clearly Use silence appropriately Recognize patient verbal and non verbal cues Reflects patients emotion by naming it Identify patient's reason for consultation Gather information to rule in or out differential diagnosis Consider biopsychosocial approach as appropriate Apply well organized approach to information gathering				
Physical Examination Elicit signs correctly and sensibly Use instruments correctly and sensibly				

Patient management Formulate plan with patient using CRAPRIOP Discriminating use of lab, referral and drug Use time appropriately Use clear language in explanation and reassurance Check patient level of understanding Arrange appropriate follow up and explain: why? Appropriately modify help seeking behavior				
Problem solving Generate appropriate working diagnosis Seeks signs to rule in or out diagnosis Correct application of information to reach diagnosis Apply basic behavioral and clinical knowledge in diagnosis and management Recognize limits of personal competence.				
Behavior and relationship with patient Friendly but professional relationship Convey sensibly the patient needs (I can see you are angry) Awareness about patient's attitude toward the doctor and doctor's attitudes towards the patient and the effect on management				

Anticipatory care Use opportunity for health promotion and disease prevention Sufficient explanation for preventing measures taken Sensibly attempt to promote change to healthier, lifestyle				
Record Keeping				
Self improvement				

Table 5. Family physician self-assessment form

5. Medical Records in Family Practice

Introduction:

One of the most important tools used by family physicians in their practice are medical records and registers. They play essential roles in providing high quality health services in family practice.

Important uses of medical records and registers in family practice:

- Providing data base for individuals and families.
- Help in providing continuity care. Used for on-going continuous care.
- Help in auditing the health services.
- Help in vital statistics and decision making.
- Used as documents for legal aspects and investigations if needed (medico-legal aspect of care).
- Help in communicating the relevant facts concerning the patients care among the health team.

Criteria of good medical records:

- They are organized in logical and systematic manner.
- They are complete.
- They are simple and accurate.
- They reflect the status of health and illness of the individuals and of the communities.
- They could be retrieved quickly.

Types of medical records and registers:

1. Family Health Record (FHR):

Family Health Record (FHR) is a cumulative record (folder) of all family members

It gives data base about house of the family concerning:

- Type of house.

- Source of water, sanitation, lighting, ventilation.
- Number of rooms, bath, kitchen… etc.
- Presence and of absence of insect, rats.
- General health condition of the house.

It contains the individual medical file of each member of the family providing with all data base.

2. Individual medical file:

Individual medical file consists of the following sheets:

i. **Data Base Sheet:** Contains (Date of birth, sex, marital status, educational status, occupation, medical, surgical, family, social history, drug history, history of allergies).

ii. **Physical Examination Sheet:**Includes initial clinical examination such as weight, height, BMI, eye, ear, nervous system, cardiovascular system, respiratory system, gastrointestinal system, musculo-skeletal system.

iii **Lab Sheet:** Include base line investigations such as urine, stool, blood and electrolytes.

iv. **Immunization sheet**: One sheet is provided to record the vaccines received by the individual child according to the date of administration/schedule.

v. **Follow-up Sheets:** They consist of many pages specified for follow-up visits. They contain space for date, vital signs, complaints and clinical findings, diagnosis, treatment and appointment.

3. Problem (Patient) Oriented Medical Record (POMR):

i. POMR contains two main components:

- Data Base (mentioned in the previous section).

- Problem List: The problem list is established after gathering of data base and conducting the relevant clinical examination and investigations.

Problem list could include:

- Pathological diagnosis (Thyroditis).
- Disability (Deafness).
- Deformity (Scoliosis).
- Social (Poverty).
- Psychological (Stress).
- Clinical diagnosis (Hypertension).
- Chronic symptom (Fatigue).
- Active health problem (Bronchial Asthma)

ii. Progress Note: Progress note is designed to record the progress of the patient either for one or multiple problems in family practice. We usually use progress note depending on (SOAP System).

SOAP System stands for: Subjective, Objective, Assessment and Plan.

For each problem, all these four elements should be covered adequately.
Example:
45 years old male presented with cough for 3 days. His chest examination revealed tachypnea and chest X-rays showed left lung collapse. By using SOAP we can write the progress note of this patient as follows:

Subjective: What is the patient complaint? (cough).
Objective: What is your clinical and lab. findings? (tachypnea and left lung collapse)
Assessment: severely distressed patient due to left lung collapse (diagnosis and clinical status of the case).
Plan: What should be done? Immediate referral to chest physician.

S: Cough for 3 days.
O: left lung collapse.
A: Severe distress due to collapse of left lung.
P: Immediate referral to chest physician.

4. Flow Sheets

The flow sheet is a special sheet designed in relation to time. It is useful to find out the changes which occurred in a patient during short time. It has the following advantages:

- Quick data retrieval.
- Easy comparison of date.
- Easy reminder to the health professionals.

Flow sheet is usually used to assess changes in parameters such as:

- Blood pressure in hypertensive patients.
- Blood sugar in diabetics
- Input/output of urine in patient with acute renal failure.
- Peak Flow Meter in asthmatic patients.

5. Special Lists:

In family practice we use some special lists which are considered advantageous for patient and physician. These lists could be used to remind the physician or can be used for auditing. These lists include:

- Drug list (deals with the recording of all the drugs used by the patient (name, dose, frequency, duration and route of administration).
- Health education list (deals with the title of the topics which were discussed with patient such as diabetic, asthmatics and obese patients).

6. Special Forms

In family practice we use special forms for special patient. These forms could be part of the patient's file. For example, Diabetic form which consists of many sheets: the first one designed for data base, the second page for follow-up visits,the third page for annual check-up, fourth page for health education and the fifth page for drug list.
Similar forms could be used for hypertensive, asthmatic and obese patients.

7. Special Registers:

In family medicine and primary health care practice, we have many registers. These registers include:

- Birth register.
- Death register.
- Drugs register.
- Communicable disease register.
- Morbidity register.
- Outpatient clinic register.
- Immunization register.
- Antenatal care register.
- Health Education register.
- Laboratory register.
- High risk baby register.
- Dressing and injection register.
- Emergency department register.
- Reproductive age register (female age 15-45 years).
- Referral register

Methods of medical records storage:

Medical records can be stored or retrieved by using many methods. However, the most common two methods are:

1. Alphabetic filing system:
In this system the records are stored according to surnames of individuals. One of the common problems of this system is misfiling due to similarity of many names and ethnic group.

2. Numeric System:
This system is commonly used in Medical Record Department. This system is rapid and accurate.

6. Prescribing in Family Practice

Introduction:

Family physicians are considered the best specialists to prescribe varieties of drugs to their patients. Drug list in family practice exceeds 140 items.

The written prescription is a method and a message of communication between family physicians and the pharmacists or pharmacy assistants. This massage should be clear and specific.

Elements of an ideal prescription:

- Information about the patient (name, age, sex, family health record number, weight for pediatrics patient.
- Diagnosis and its code.
- Date of prescribing.
- Superscription (Rx symbol). - Rx (it means "you take").
- Inscription (it includes)
  - Name of drug (generic name).
  - Drug form (Tablet, capsule, syrup, drops).
  - Drug strength (mg, g, ml).
- Subscription (direction to pharmacist), it includes:
  - Number, volume, size of drugs.
  - Duration.
- Transcription (direction to the patient), it includes:
  - Route of administration (oral, rectal, etc.).
  - Time of using drug.
  - Frequency of using drug.
  - Duration of using drugs.
- Signature and stamp of the treating physician.

Note: Unless prescription is signed and stamped by the physician. Neither it is official nor legal as yet.

Criteria of essential drugs used in family and primary health care practices:

- Easy to purchase, store and to distribute.
- Compound drugs have additional advantages.
- Small numbers of drugs with ability to treat common health problems.
- Drugs with sure efficacy and less side effects.
- High quality and standards drugs.
- Reasonable cost.

Common mistakes committed by patients while using drugs:

- Incorrect dose.
- Incorrect route.
- Incorrect intervals between the doses.
- Forgetfulness of instruction (before, after with meals).
- Stop using the drugs after the disappearance of symptoms (e.g. diabetes, hypertension).
- Discontinuation of drugs even after developing minor side effects.
- Using many drugs at one time.

How to prevent them?

- By health educating the patient regarding utility of importance drugs, common side effects, etc.)
- By writing clear instructions for patients.
- By involving one of the family members especially among extreme ages (Children, elderly).
- By follow-up.

Commonly used abbreviations in family practice:

Abbreviation	Latin	English Meaning
AC	Ante Cibos	Before meal.
PC	Post cibos	After meal.
hs	Horasomni	At bed time.
q	Quaque	Each.
ss	Semis	One-half.
tab	Tabella	Tablet.
caps	Capsula	Capsule.
IM	Intra-Muscular	Intra-muscular Injection.
IV	Intravenous	Intravenous.
SC	Subcutaneous	Subcutaneous Injection.
PRN	Pro re nata	When necessary.
TID	Ter in die	Three times a day.
QID	Quarter in die	Four times a day.
BID	Bis in die	Two times a day.

Table 6: Commonly used abbreviations in prescriptions .

Clinical notes & prescription:

Before writing any prescription, family physicians should ensure the following points:

- Any complaint related with the use of drugs (Drug reaction/ sensitivity).
- Appropriateness of drugs for the patient.
- The interaction of drug with other medications.
- The health problem cannot be managed by non-pharmacological remedies (exercise, diet, etc.).

7. Referral in Family Practice

Introduction:

Family physicians are responsible for total health care of their people. Sometimes, they need assistance of other health professionals to manage their patients. Formal communication between family physicians and other medical specialists and consultants to care for patients is known as referral. In Saudi Arabia, primary health care physicians refer between 2-4% of their patients to specialists or consultants. Most of these referrals are directed to the specialties like obstetric, eye, and dermatology.

Reasons for referral:

Reasons for referral differ from one family physician to another. However, the following reasons are responsible for most of the referral to secondary care.

- Training and experience of family physicians.
- Personality of family physicians.
- Inadequate diagnostic and therapeutic resources and service at his/her practice.
- Patient's request for referral.

When to refer?

Family physicians should refer his their patients when they feel that the patients will get benefit from referral and also when they are unable to care for the patient efficiently at family practice setting.

Criteria of good referral letters:

The referral letter provides information about the patient from the family physicians to health professional. In order to have good referral letter, it is essential to follow the following instructions:

- Referral letter should be concise and contains essential information.

- Select the relevant data and information that will help the patients and the doctors who receive the letter.
- Write clearly and use simple language.
- Clarify and specify the reasons for referral and your expectation from the referral.
- All information in the referral letter should be accurate.
- Document the referral in the file of the patient and referral register.

Elements of referral letter:

Referreal letter should contains the following

- Socio-demographic data of the patient such as name, age, sex, family health record number.
- Name of hospital and specialty to which the patient will be referred.
- Type of referral (urgent, elective).
- Chief complaint and present history.
- Past medical and surgical history.
- Relevant physical examination.
- Relevant laboratory and radiology investigations.
- Medications in use.
- Clinical diagnoses.
- Reasons for referral.
- Name, signature and stamp of the referring physician.

Duties of family physician regarding referral process:

- Discuss the referral with the patient.
- Select the appropriate specialty and also the specialist.
- Completing the referral form properly.

Referral Form

Family Practice: _____ Family Health Record No. _____

Patient Name:_____ age: ___ sex: Male ( ) Female ( )

Type of Referral: Elective ( ) Urgent ( ) Specialty (_____)

Chief complaints and present history:

Vital Signs: BP: _____Pulse:_____ Temperature: _____ Weight:_____

Relevant Physical Examination (important positive and negative findings**):**

Relevant laboratory and diagnostic results:

Diagnosis:

Reasons for referral:

Referring physician:

Name: _____ Signature:_____ Stamp:_____

Fig. 6. Refererral form

8. The Health Team

Introduction:

Working within a team leads to good services to the clients. Family physician is considered an appropriate leader of the health team in most of primary health or family practice settings due to many characteristics. These include broad spectrum of knowledge in many fields such as management, statistics, epidemiology, health economics and leadership skills.

Definition:

Health team is defined as a group of people working together to achieve specific objectives.

Functions of health team:

- Planning for health services.
- Conducting specific programs.
- Evaluation of health related programs such as antenatal care, immunization, etc.)

Members of health team:

- Family physician (leader).
- Nurses, midwives.
- Pharmacist/pharmacy assistant.
- Epidemiologist
- Sociologist.
- Psychologist.
- Lab technician and X-ray technician.
- Health inspector.
- Administrator.
- Dentist or dental assistant.
- Health educator.
- Other as appropriate.

Tasks of the health team leader:

- To determine the responsibilities and tasks of each member according to his/her efficiency.
- To solve the problems and conflicts among the health team if any.
- To evaluate the performance of each member.
- To communicate with the concerned sectors.
- To introduce and give incentives to those who perform their tasks efficiently.
- To identify the training needs of each member and to coordinate to conduct training course for those in need.
- To provide emotional and financial supports (incentives) to members.
- To do regular and periodic supervision.
- To encourage all members to participate in planning.
- To delegate some of the tasks to any other competent member.

Criteria of an effective health team:

- Has a good role model leader.
- Sharing of all members in planning.
- Equal treatment to all members.
- Good relationship between the leader and members of the team.
- Appreciations of those who achieve their tasks.
- Clear objective of the health team.
- Giving more authority to those who achieve their given tasks.
- Effective and good communication between the leader and members of the health team.
- Regular meeting.

Factors weaken the health team:

- Weak or bad role model.leadership.
- Poor supervision.
- Unclear tasks for each member.
- Inadequate resources.
- Heterogeneous health team.
- Lack of incentives.
- Lack of training.
- Lack of clear objectives.

Common challenges facing the health team:

- Competition instead of integration.
- Attainment of a dominant role by a member.
- No compliance the the plan of health team.
- Personal interests and performance.
- Grouping into two as per the choice of the members.
- Refusal of use of new technology (by some members)
- Undesirable interference among tasks of members.
- Team is not enthusiastic.
- No feedback during meetings.

9. Patient Compliance

Introduction:

Compliance in family practice is defined as the extent or the degree of patient adherence to medical advice that is given by the physician. Grading of compliance is a relative process. Compliance to using drugs can be considered as good if the patient adheres strongly and use his medications all the times. Adherence to life style changes such as exercise, diet therapy is one of the difficult types of compliance concerning to its evaluation. Overestimation of compliance is common among physicians in spite of many patients who are non-compliant to their doctor's advice.

Factors affecting compliance:

Many factors affect the compliance. However, it can be discussed under five headings; the patient, the disease, the regimen, physician and health care system.

1. The patient:

Patient characteristics such as age, sex, job, income, marital status and educational status can affect the compliance. However, there is no consistent relationship between all these attributes except for ages which were found in its extremes (young and old patients who are under the supervision of their relatives).
Those who do not know about their illnesses and importance of their medications may not comply to the medical advice.
In family practice, health belief model which includes susceptibility to and severity of diseases, the effectiveness of drugs can affect the compliance to some extent. Generally, those who think that they are prone to develop illness or suffer from severe symptoms and those who believe in the effectiveness of drugs, will adhere to the medical advice better than their counterparts.

2. The disease:

Diseases are the main cause of using drugs. However, no strong relationship was found between the severity of diseases and good compliance to medication except in the disabled patient which could be due to increased medical supervision rather than due to severity of the health problem. Patients who suffer from chronic diseases who are on long term therapy, increasingly have poor compliance for drugs and for changing their life styles such as exercise and diet regimens.

3. The regimen:

Regimen which requires changing life styles (diet, exercise, weight reduction, smoking cessation) result in poor compliance than taking pills because the former needs greater behavioral changes. On the other hand, as the number of drugs, doses and duration increases, the compliance decreases. The characteristics of drugs such as size of tablet, its color, odor, can affect compliance.

Side effects, it has minimal impact on compliance to using the drugs. Routes of administration has important effect on compliance, using injectable penicillin to prevent rheumatic fever, showed better compliance in comparison to the oral form.

Cost of treatment can affect the compliance with medications. In one study conducted in Aseer region among diabetics, it was found that unavailability of drugs at primary health care settings was the main reason for poor adherence to medications.

4. The physician:

Doctors are the persons who write the prescriptions. They can prescribe many drugs or few drugs, they have the authority to give the drugs which should be used every four hours or that drug which could be used twice daily. They can simplify the regimen or they can make it as complex as anything. Physicians who discuss with their patients regarding the using of medications and allow them to participate in management will have positive effect in increasing the degree of adherence to medical advice.

It was also found that when the physicians accomplish their patient's expectations, their patients would try to do better compliance.

5. Health care system:

Although health care system was not considered a barrier to compliance in the western countries, its negative effect on compliance is strongly present among Saudis. Multiple health care system (Ministry of Health, Military Hospitals, National Guard Hospitals, Private health sector), alongwith free of charge services, contribute significantly to poor compliance particularly to appointment. Such multi-system health care which lack clinical protocols could result in patient confusion and then poor adherence.

6. Detection of poor compliance:

It is not easy task to detect the poor compliance among patients in the absence of real assessment tools particularly in family practice. However, some aspect of patient care can give good indication about the compliance such as the following:

i. **Monitoring of attendance:** It was found that those who adhere to appointment usually have good compliance to drugs in comparison to their counterparts.

ii. Response to treatment: If the medication is known to be efficacious, failure response to this drug can be used as an acceptable tool to assess the degree of compliance to such drug. However, wrong diagnosis and over-prescription by the doctors could compensate for the patient's poor compliance and hence we can not depend on this tool if such things are suspected.

iii. Asking the patients: In family practice, we depend on asking the patients in order to assess most of the patient's aspect. However, asking about compliance is very critical issue that the physicians should be aware of framing the question. If you ask direct or judgmental question the response to such question will be defensive as most of us do not like to be asked such type of questions. In order to avoid this dilemma, you can delay the question till the end of consultation, to ask it in non-judgmental way such as "many patients find it difficult to remember taking their drugs, what about you in this regard".

iv. Counting pills: In spite of the relative accuracy of counting pills to ensure good compliance to drugs, such a method is not practical in Saudi community for many reasons; firstly, the patients in most of situations do not comply with their appointment which make such a tool difficult to use, secondly so many patients can get their medications from different medical sectors even without prescriptions and lastly the patients usually do not bring their medications when they come to their doctors.

v. Drugs levels: measuring drug level can be used. However, the hospital settings are the places where one can do such type of assessment and in some conditions such as epilepsy and cardiac cases, it can be very imformative.

Prevention of poor compliance in Family Practice

To prevent poor compliance among the patients it is essential to identify and to remove the barriers to it. In some communities, the doctor

centered approach is still practised by most of the physicians and the patients have minor role in caring for themselves. As a result, it is so important to make the clients as active participants in discussing their health problem and sharing with all aspects of management. There are some important obstacles which could be overcome in order to improve compliance. These obstacles are: unavailability of drugs at family practice, long waiting time before meeting physicians, prescribing complex regimens to patients without providing them with clear written instructions in addition to specification of the next appointment to the patients.

Treatment of poor compliance:

- Follow up and call the defaulter patients.
- Increase the attention & supervision.
- Use cueing, feedback and positive reinforcement.
- Titer frequencies of appointment according to degree of compliance.
- Involvement of family members in caring of some patients such as children, elders, diabetics and asthmatics.
- Involvement of the other health team such as pharmacists and nurses.

10. Evidence Based Medicine

Introduction:

Evidence Based Medicine (EBM) has emerged from different disciplines such as, epidemiology, research methodology, biostatistics and medicus informatics aiming to use appropriate evidence to care for patients and to consider patients values and preferences to be a factor in medical decision. So, it is a result of interaction among, experience, research and patient preferences.

Definitions:

1. Traditional definition by David Sackett:
"… the conscientious, explicit and judicious use of current best evidence in making decision about the care of individual patient". Hence it is the process of finding and applying the best available clinical research evidence to the management of individual patient.

2. Sackett, et al 2001:
"Evidence-based medicine is the integration of best research evidence with clinical expertise and patient values"

3. Practical definition (steps):

- Practical definition: is based on the objectives of learning; knowledge, skills and belief and commonly known with the acronym' ***"FRAPE***"
- ***F: F*raming Evidence-based questions:** The ability to translate clinical case to an answerable question.
- ***R: R*etrieving relevant evidence:** The ability of the physician to obtain a sound evidence relevant to the question at hand.
- ***A: A*ppraising the evidence**: The ability of the care provider to determine which of the available evidence is the best.
- ***P: P*atient-based decision making**: physicians believe that the application of the best available evidence will benefit and the patient will experience the most desired outcome

- ***E: E*valuate your performance in each step**

Differences between traditional medicine and Evidence Based Medicine:

The following are the some differences between traditional and evidence based medicine

Traditional Medicine	EBM
1. Physicians' knowledge in diagnosis,treatment and prognosis based on unsystematic observation.	1. Although clinical experience is crucial. However, systematic unbiased observations increase the confidence of the physicians' knowledge about the diagnosis, treatment and prognosis.
2. Pathophysiological principles are a sufficient guide for clinical practice.	2. Decision based on pathophysiologic principles may be incorrect.
3. Combination of Medical training and the common sense is enough to evaluate new test and treatment.	3. Certain rules of evidence are necessary
4. Experience is sufficient to establish clinical guidelines	4. Clinical guidelines based on critical appraisal of the medical literature.
5. Give high priority to experts opinions.	5. Physicians can gain skills to make independence decisions and can evaluate expert opinions

Table 7. Differences between traditional medicine and Evidence Based Medicine

The need for EBM:

Studies showed that general physicians identified up to 16 needs for new clinically important information in just half a day at a rate of two questions for every three patients they come across. About half of their questions were related to therapeutics and a quarter to diagnosis.

Clinicians identified three barriers to obtain appropriate information. The lack of time to keep up to-date, out of date textbooks even when they were new and the journals were too disorganized to be retrieved.

It has been observed that there is statistically and clinically significant negative correlation between updating knowledge and the years that have elapsed since graduation from college of medicine.

In addition, traditional continuing medical education has been shown to be ineffective in improving the health outcomes of patients. Currently, there are more than two million articles published annually in more than 23,000 biomedical journals. To keep up to date, General Physician should read 19 articles per day.

Source of information:

In the light of these complexities of modern medical practice there is a need to become competent to have a logical, systematic quick approach to get an answer to the clinical problems that are faced in daily practice regarding the patient outcomes, health cost, and value of care. Sources of information can be:

1. **Academic Reviews**

   a. Textbooks: A collection of academic reviews
   limitations: 1. Little supporting evidences.
   2. Difficult to assess the validity.

   b. Review inscientific journals: Summary reviews: provide a broad coverage of one topic

lmitations: 1**.** fficult to assess the validity of summary review i.e. you have to trace the primary research

2. thesis review: trying to answer a specific question.

3. Met-analysis: the type of synthesis review in which the result of several scientific trials are pooled.

c. some sources of evidence based medicine:

Agency for Healthcare Research and Quality (AHRQ)
http://www.ahrq.gov/clinic

American College of Physicians Journal Club (ACPJC)
http://www.acponline.org/journals/acpjc/jcmenu.htm

Bandolier
http://www.jr2.ox.ac.uk/bandolier/

Centre for Evidence Based Medicine (CEBM)
http://cenm.jr.ox.ac.uk/

Center for Research Support, TRIP Database
http://www.ceres.uwcm.ac.uk/frameset.cfm?section=trip

Clinical Evidence, BMJ Publishing Group
http:www.clinicalevidence.org

Cochrane Database of Systematic Reviews
http://www.cochrane.org/

Database of Abstracts of reviewers of Effectiveness (DARE)
http://agatha.york.ac.uk/darehp.htm

Effective Health Care
http://www.york.ac.uk/inst/crd/ehch.htm
Evidence-Based Medicine
http://www.evidence-basedmedicine.com

Evidence-Based Practice Newsletter (including JFP Patient-Oriented Evidence that Matters [POEM])
HTTP://www.ICSI.org

Institute for Clinical System Improvement (ICSI)
http://www.ICSI.org

Medical Info Retriever (including JFP POEMs)
http://www.medicalinforetriever.com/

National Guideline Clearinghouse (NGC)
http://www.guidelines.gov/index.asp

National Health /service (NHS) Centre for Reviews and Dissemination (CRD)
Http://www.york.ac.uk/inst/crd/

Primary Care Clinical Practice Guidelines
http://medicine.ucsf.edu/resources/guidelines

U.S. Preventive Services Task Force (USPSTF)
http://www.ahrq.gov/clinic/uspstfix.htm

Others.

Basic concepts of EBM:

It is of a great importance for family physicians to keep up to date and to reinforce the previously known information, to help them to manage and translate medical recommendations to his/her patients, and to be able to answer their questions that could be raised.

Disease-Oriented Evidence (DOE)

The clinical problem addressed on the basis of disease process and in accordance with physicians' knowledge in basic and clinical subjects related to the problem e.g. using drug (x) decreases the level of serum lipid.

Patient-oriented Evidence that Matters (POEMs)

It is the information which is related with the outcomes like morbidity or mortality which may be beneficial to patients. e.g. using drug (x) results in decrease in mortality and morbidity (such as functional ability, well-being satisfaction and mental health) not just a decrease in the level of serum lipid itself for instance.

POEMS vs. DOE

Family physician should recognize the limitations of ***DOE*** and to take his decisions based on ***POEMS***, as the patient is more interested in not having myocardial infarction or cerebro-vascular accident (CVA) than in the level of serum lipid level itself. However, when POEM is not available DOE is necessary.

Usefulness equation:

$$Usefulness = \frac{Relevance \times Validity}{Work}$$

Usefulness of information is directly related to its relevance and validity and inversely related with the work required to obtain it.
Where:

- *Relevance* is the importance of information in the clinical setting.
- *Validity* is the level of correctness of the information (truth).
- *Work* The amount of work needed to acquire the new information.

Examples:
If the article is not relevant (relevance = 0) or not valid (validity = 0) then the study is useless.
If the study is valid and relevant to the practice but the work needed to obtain the information is huge, then study is useless.

Steps of EBM:

6 As
1. **A**ssess the patient
2. **A**sk clinical quistion
3. **A**cquire the evidence
4. **A**ppraise the evidence
5. **A**pply the best evidence
6. **A**ssess your performance

Step 1. Assess the Patient*:*
By taking history, performing physical examination and reviewing his/her records .

Step 2. Ask the appropriate clinical question
By considering the following:

1. **Anatomy of the question**: using ***PICO*** form:
   (***P***atient problem) + (***I***ntervention) + (***C***omparison) + (***O***utcomes)

Example:
(Child with otitis media) + (Amoxicillin) + (No antibiotic) + (Early recovery).
i.e. "In pediatric age group, using Amoxicillin comparing with no treatment will lead to early recovery" ?

2. Type of the question:
1. diagnosis
2. Therapy
3. Prognosis
4. Harm

3. Type of study: Which type of studies can answer your question properly?

1. Randomized control trials
2. Cohort studies
3. Case control studies

4. Case report/series
5. Opinions/letters
6. Animal research
7. In-vitro research

Step 3. Acquire the evidence:
The source": Select appropriate source(s) and conduct a search. e.g. ACP journal, Cochrane database, etc. (You need to understand search strategies).

Step 4. Appraise the evidence:
You have to have the skills in choosing the article which can answer your question. In this Chapter, we will discuss the method of appraising therapy and diagnostic studies. For further readings in these type of studies and other types, please check "Users Guide to Medical Literature series"

i. critical appraisal of diagnostic paper

Before you start appraising the article, you have to specify the following:
1. Aim of the study 2. the test 3. the standard 4. the prevalence 5. the inclusion /exclusion criteria.

Then start appraising the article according to" **Users' Guides to Medical Literature Series '**

I. Jaeschke R, Guyatt G, Sackett DL. How to use an article about a diagnostic test. A. Are the results of the study valid? Evidence-Based Medicine Working Group. *JAMA.* 1994;271:389-391.

I.]aeschke R, Guyatt GH, Sackett DL. How to use an article about a diagnostic test. B. What are the results and will they help me in caring for my patients? Evidence-Based Medicine Working Group. *JAMA.* 1994;271:59-63.

Using the following Table.

Title & Cite……

GUIDE		COMMENT
A*: Are the results of the study VALID*?: Does it actually measure what it claims to measure. i.e: (Unbiased), close to truth?		
1	Was there an **INDEPENDENT, BLIND** comparison with a reference STANDARD? *was Standard acceptable? *Were Standard+Test done to all *Was Interpreter unaware of the other result (no expectation bias)	**Standard**: clinical findings or criteria on which Diagnosis depends. Any subject must receive Standard test regardless of the result of the new test. Blindness is especially important when the interpretation of either Standard or Test are subjective (inter-observer variability).
2	Did the patient's sample include an appropriate **SEPCTRUM** of patients to whom the diagnostic test was applied? • What is the setting *setting?* • *Spectrum* Patient *demography* *Biology* Disease *severity Duration*	Refer primarily to setting from which participants were drawn (tertiary vs. primary). Different ages, sex or co-morbidity, longer duration of disease or severity .All these affect pre-test probability.

3	Did **ALL PATIENTS** undergo the reference standard regardless of their test results? • Standard + Test done to all (No verification-work up bias)	If standard was performed only on a subset of all the subjects e.g. on whom test was abnormal, this will lead to the missing of false negative. If standard could not be done for a good reason (e.g. ethical) another appropriate alternative should be used e.g. follow up for enough time.
4	Were the methods of the tests **DESCRIBED** in sufficient detail to permit replication? The article fully disclose the following: *Preparation: Diet, drug, precaution) *Performance: technique, pain. *Analysis and interpretation: e.g.need a skilled person	This aims to: 1. Show that test can be confirmed by others, otherwise you will depend on one source only. 2. Show any limitation before relying on it e.g. technique, skill level, other. which might make the Test unpractical or unreliable except in certain hands.

B: What are the RESULTS?	This shows what are the size and precision of Diagnostic effect.
What were the **LIKELIHOOD RATIOS (LR)**? either • Given in the paper. or • Data available to calculate	**LR:** Determine the power of the test **Power**: Reflect the ability of the test to alter the pre-test estimate of the disease likelihood either upward (abnormal results) or downward (normal result)

LR = Probability of Positive test in a diseased person/probability of Positive test in a healthy person.

Expression:

Positive LR means: All patients with positive results, X are correct for every one that is incorrect.
Positive LR = Sensitivity / 1- specificity (>1)

Negative LR means: All patients with negative result Y are incorrect for every one that is correct.
Negative LR = 1 – sensitivity/specificity (< 1)

You might find the following + LR results

> 10 or < 0.1	large and often conclusive changes from pre to post test probability
5 *to*10 or 0.1 *to* 0.2	moderate shift in pre to post probability
2 *to*5 or 0.5 *to* 0.2	small (but sometimes important) change in probability
1 *to* 2 or 0.5 *to* 1	alter probability to a small (rarely important) degree.

(You can use the Normogram)

You may need to construct 2x2 table .

Test result	Standard Results	
	Positive	Negative
Positive	True Positive	False Positive
Negative	False Negative	True Negative

Sensitivity = True Positive / True Positive + False Negative
When ***Sen***sitive test is ***N***egative rules out the disease **.**
Specificity = True Negative / False Positive + True Negative
When ***Sp***ecific test is Positive it rules out the disease.

C: Will the results help me in caring of MY PATIENTS?		
1	Will the **REPRODUCIBILITY** of the test result and its interpretation be satisfactory in my setting? *Does the test differs in my setting from that in the study due to different reagents, cost, risk, painful etc) * Is there an Inter-observer variability (subjective decision) e.g. ECG or X-ray interpretation or the test Interpretation needs high skilled person	This explores if the test be practical and comparable to the result in the paper when used in your setting. Test sometime could not be advised regardless of its accuracy for other practical reasons.

2	Are the results **APPLICABLE** to my patient? (patient in the clinical question) do you have any of the folowibg: * similar inclusive criteria * similar diseases severity and duration * similar competing factors * no compelling reasons that the results should not be applied	This aims to explore if the patients in study group resemble the patient in the clinical question biologically and demographically
3	Will the results **CHANGE MY MANAGEMENT**? * Why do we do the test? * Will it remove any need for other test? *What is test and treatment threshold? *Is likelihood ratio high or low. i.e. depending on this test, will I treat or rule out the disease? Use normogram.If you don't know the prevalence of the disease in the community (pretest probability) do the estimate.	Patient were advised initially for treatment but we would decide against this if the result of the test were normal. Or, if physician tend initially NOT to treat the patient but, he was treated when result were abnormal. It means the test is valuable. i.e. if the test might change the physician's mind, it is worth doing. Then if test would not change the physician's mind it should not be performed.

		In your daily practice, when you want to do an investigation ask yourself, will it change my decision ?
4	Will patients be **BETTER OFF** as a result of the test? * is target disorder dangerous if left undiagnosed? * Is test risk acceptable? * Does effective treatment exist? *Will the result of test lead to change of management beneficial to patient.	If application of this test will benefit my patient. i.e. will lead to a preferred outcome on an average.

Table 8. critical appraisal od diagnostic papare

ii.Critical appraisal of thearputic paper:

Before you start appraising research paper on therapy or prevention you have to screen it quickly to understand the following:

1. the aim of the study 2. the intervention used 3. Control 4. the method Then start appraising according to" **Users' Guides to Medical Literature Series"**

I. Guyatt GH, Sackett DL, Cook D]. How to use an article about therapy or prevention. A. Are the results of the study valid? Evidence-Based Medicine Working Group. *JAMA.*1993; 270: 2598-2601.
II. Guyatt GH, Sackett DL, Cook DJ. How to use an article about therapy or prevention. B. What are the results and will they help me in caring for my patients? Evidence-Based Medicine Working Group. *JAMA.* 1994;271:59-63.

Use the following Table:

GUIDE		COMMENT
A. Are the results of the study **VALID**? = Soundness of the method		
1	Was the assignment of patients to treatments **RANDOMIZED**?	Randomization will ensure that known and unknown determinants of outcome are distributed between treatments and control groups. If no randomization, this will lead to increase in false positive.
2	Were all patients who entered into the trial properly accounted for and attributed at its conclusion (Study must start and end with the same number of patients) Fig.1 Was follow-up complete?	Every patient who entered in the study should reach a clear understanding to avoid lost to follow up. Lost patients usually has different prognosis: side effects, death, improvement (increase in lost means weak study). To be sure of a study's conclusion, lost subjects should be assigned to the worst case outcome. Good studies has > 80% follow up for patients which equal endpoint divided by initial group number.

GUIDE		COMMENT
2	b.Were the patients **ANALYZED IN THE GROUP** to which they were randomized?	This addresses the issue of continuity. The goal is to track every single patient in the originally assigned group and analyze each subject as part of that group whether or not the individual adhered to the protocol. This method is called: **INTENTION TO TREAT ANALYSIS**.
3	Were patients, health workers, and the study personnel (invistigators) **"BLIND" TO TREATMENT**? What about Concealment?	This means that the people involved in the study do not know which treatment is given to which patient. The best method to avoid bias is double blinding by placebo. Human nature creates a desire to see the treatment effect by many researchers and positive results are more likely to be published. This concept is known as ***publication bias***. Blinding sometimes is impossible e.g. surgery or side effects. In such cases, blinding should not be criterion of validity.

GUIDE		COMMENT
3		***Concealmen***t: the random allocation was concealed from e researchers who are responsible for assessing individuals for enrollment, hence, those who do inclusion/exclusion criteria do not know which patient in which group (controlled or treated) otherwise this will lead to a bias e.g. if a patient has wheeze in a study on bronchodilators more likely to be put in treatment group to benefit him rather than conrolled one.
4	Were all groups **SIMILAR** at the start of trial? Baseline prognostic factors (Demographics, co-morbidity, disease severity, other known confounders). If different were adjusted for?	The treatment and control groups must be similar for all prognostic characteristics except one: whether or not they received the experimental treatment. This usually displays in tables that outline the baseline characteristics of both groups. If difference exists, the practitioner must use clinical knowledge to determine to what degree such discrepancies affect patient in the clinical question.

GUIDE		COMMENT
5	Apart from the experimental intervention, were groups **TRETAED EQUALLY**? * Co-intervention * Contamination * Compliance	Both groups must be treated equally except administration of the experimental treatment. If co-intervention other than the study treatment, happen this means we deal differently with the two groups. If they exist they must be described in the method section. e.g. One group received closer follow up, patient may receive herbal medicine. Hence precaution must be taken to avoid co-intervention, contamination or difference in compliance of follow up.
B. What are the results?		
	a. How large was the treatment **EFFECT**?	***1. Event Rate(ER)***: The probability that an outcome will occur in a defined population. Control Event Rate (CER): the ER in the ***untreated*** group. Experimental Event Rate (EER): the ER in the ***treated*** group ***2. Relative terms:*** Relative Risk (RR): (CER-EER) Relative Risk Reduction (RRR): CER–EER CER = 1-RR (used when bad outcome diminishes with treatment)

GUIDE		COMMENT
		Relative benefit increase = EER – CER / CER (used when good outcome increases with treatment
	b. How **PRECISE** was the estimate of the treatment effect? * Confidence interval * P-Value	***3. Absolute terms***: Absolute Risk Reduction (ARR): when a bad outcome occurs less frequently with treatment than without = CER-EER Absolute Benefit Increase (ABI)) used when desirable outcome increases with treatment =EER-CER ***Confidence Interval (CI):*** represents a range of values for a given observation within which confidence exists, within a reselected aberration. It allows the practitioners to select and assess just how much uncertainty they are willing to tolerate. In clinical research a 95% CI is used often but a 90%, 99% or any other percent may be used. If the 95% CI for the difference between the results does include zero the assumption is that a 5% or greater chance exists that this apparent difference between the two groups is due to chance alone.

GUIDE		COMMENT
		The factors that affect the CI are the size of the study population, the magnitude of the effect and the spread of the results. ***Clinical significant***: Refers to whether the effect being measured is sufficiently important to the patient to alter management decision. A practical approach in the application of CI to explore the clinical importance is to determine whether the clinical decision would change if the true results were at the low end of the interval Vs. upper end. e.g. drug decreases. pain for 4 days [CI 0.5-5] you determine that given side effects the treatment might be worth trying if the reduction were 5 days (upper) but if it is 0.5 day (lower) you would not choose this treatment. But, if 4 [3.8-4.2] you will choose. ***P va***lue: Gives less information for clinician. It makes clinical significance impossible to assess. The reader advises to use CI whenever possible, but p values still seen frequently in research.

GUIDE		**COMMENT**
C. Will the results help me in caring **MY PATIENTS**?: Usefulness in clinical practice.		
1	Will the results be **APPLIED** to my patient care? Patients, **similar** for demographic, severity, co-morbidity and other prognostic factors. **Compelling reason** why they should not be applied.	Meet inclusions and exclusion criteria of the patient in clinical question i.e this research finding can be generalized to the patient in clinical question. If not clear, just judge its application to your patient.
2	Were **ALL** clinically, important **OUTCOMES** considered? Are substitute **endpoints** valid?	Given the likelihood of improvement, and the risks of treatment. What is the impact of each outcome on the patients quality of life. Do the improvement out weigh the risk? Factors considered in decision analysis: **Natural course of the illness:** What will happen if I don't take treatment in the paper, is the disease you are taking this treatment for, is self limiting or chronic. **Likelihood that the treatment improves symptoms and prognosis**: does it benefit only a small proportion of patients

GUIDE		**COMMENT**
2		**Likelihood of side effects**: are they prevalent or rare?! Intensity of side effects. If I experience side effects, will I accept them as a simple bad luck?! **Other issues**: Cost, discomfort, disability, preferences of friends and loves ones. *Remember: "We treat the patient not lab"*
3	Are the likely treatment benefits **WORTH** the potential harms and costs?	**Number Needed to Treat (NNT)**: Express the treatment efficacy. It describes how many patients on average would have to be treated for one patient to derive the desired benefit. It is described as an absolute parameter. Patient benefit more when NNT is low **NNT = 100/ARR** (rounded to the next figure) **NNH**: Refers to side effects of treatmnet rather than improvement. **NNH = 100/AR**I

Table 8. Critical appraisal of therapy paper

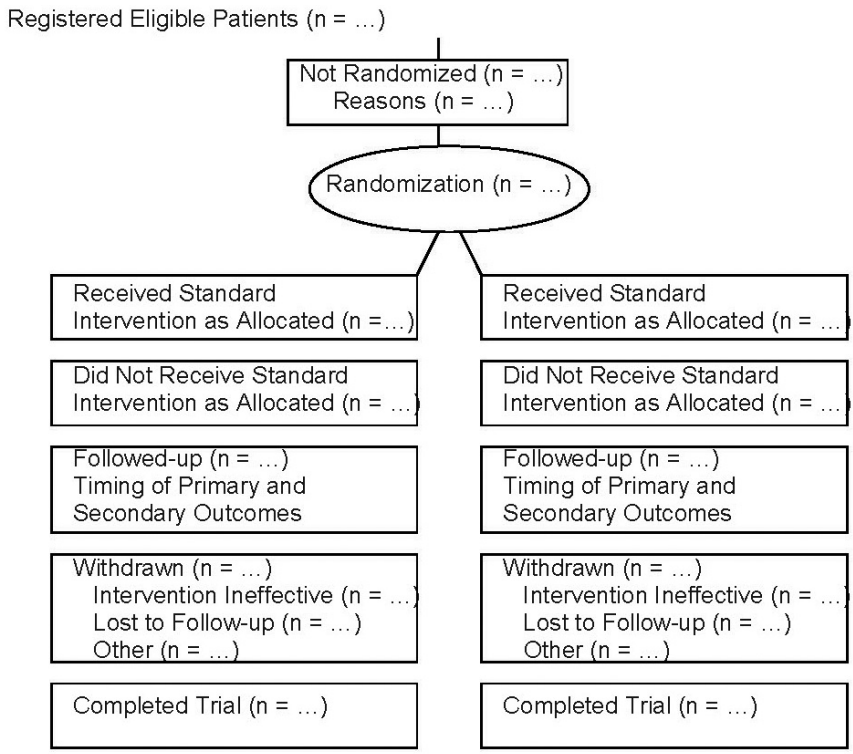


Fig. 7. Profile of a Randomized Controlled trial

Step 5: Apply the best evidence

"The pattern' application of the appraisal result to your clinical practice by integrating your best evidence with clinical experience and patient preferences.

Levels of Evidence:

Level A
1. Evidence obtained from at least one properly controlled trial.
2. High quality meta-analysis.

Level B
1. Evidence obtained from well-designed cohort or case-control trials without randomization.

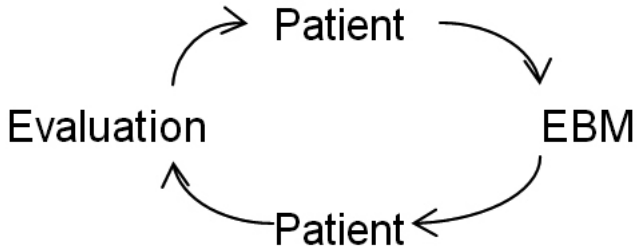
2. Evidence obtained from well-designed cohort or case-control analytic studies, preferable from more than one centre or research group.
3. Evidence obtained from comparisons between times or places with or without the intervention.

Level C: Opinion of respected authorities based on clinical experience, description studies or reports of expert committees

Step 6. Assess your performance*:*

Evaluate your performance using the above steps and take the appropriate action to improve your performance

In summary: you start with patient and return to your patients through aforementioned six steps as follows:



Clinical Practice Guidelines

Definition: They are the recommendations framed to guide physician in the care of patients.

Types: 1. Evidence-Based Guidelines

2. Consensus Guidelines (by expertise)

i Evidence based guidelines:

They are a good source of EBM if they are developed based on literature about a specific topic and rate the available recommendations depending on its usefulness as follows:

A. There is a **good** evidence to **support** the recommendations that the condition be specifically considered.

B. There is **fair** evidence to **support** the recommendations that the condition be specifically considered.

C. There is **poor** evidence regarding the **inclusion or exclusion** of the condition, but recommendations may be made on other ground.

D. There is **fair** evidence to support the recommendations that the condition be **excluded**.

E. There is **good** evidence to support the recommendations that the condition be **excluded**.

ii Consensus guidelines:

Developed by experts in a particular field e.g. American Cancer Society Guidelines. The problem with this type of guidelines is bias and can be dominated by the outspoken experts.

Family Physician has to be careful in using guidelines and has to know the type of guidelines and the basis on which they were developed and has to apply the usefulness equation on them.

Advantages - Disadvantages of practising evidence based medicine:

I. Advantages:

For individuals

- Enables clinicians to upgrade their knowledge base routinely.

- Improve clinicians' understanding of research methods and make them more critical in using data.
- Improves confidence in management decisions.
- Improves computer literacy and data searching techniques.
- Improves reading habits.

For clinical teams

- Gives team a framework for group problem solving and for teaching
- Enables juniors to contribute gain fully to the team.

For patients

- More effective use of resources
- Better communication with patients about the rationale behind the management decisions.

II. Disadvantages

- It takes time to learn and to practice.
- It is costly to establish the infrastructure for practising EBM.
- Senior clinicians may see evidence based medicine as a threat which can affect the team and remove the feeling of seniority.
- Databases are not comprehensive which may expose a gap in the evidence which can be frustrating.

Users' Guides to Medical Literature Series

I. Oxman AD, Sackett DL, Guyatt GH. How to get started. The Evidence-Based Medicine Working Group. *JAMA.* 1993;270:2093-2095.

II. Guyatt GH, Sackett DL, Cook D]. How to use an article about therapy or prevention. A. Are the results of the study valid? Evidence-Based Medicine Working Group. *JAMA.*1993; 270: 2598-2601.

III Guyatt GH, Sackett DL, Cook DJ. How to use an article about therapy or prevention. B. What are the results and will they

help me in caring for my patients? Evidence-Based Medicine Working Group. *JAMA.* 1994;271:59-63.

IV. Levine M, Walter S, Lee H, Haines T, Holbrook A, Moyer V. How to use an article about harm. Evidence-Based Medicine Working Group. *JAMA.* 1994;271:1615-1619.

V. Laupacis A, Wells G, Richardson WS, Tugwell P. How to use an article about prognosis. Evidence-Based Medicine Working Group. *JAMA.* 1994; 272:234-237. http://ugi.usersguides.org/usersguideS/hg/fOreWOrd.aSP 28/04/23

VI. Oxman AD, Cook DJ, Guyatt GH. How to use an overview. Evidence-Based Medicine Working Group.)*AMA.* 1994;272:1367-1371.

VII. Richardson WS, Detsky AS. How to use a clinical decision analysis. A. Are the results of the study valid? Evidence-Based Medicine Working Group. *JAMA.* 1995;273:1292-1295.

VII. Richardson WS, Detsky AS. How to use a clinical decision analysis. B. What are the results and will they help me in caring for my patients? Evidence Based Medicine Working Group. *JAMA.* 1995;273:1610-1613.

VIII. Hayward RS, Wilson MC, Tunis SR, Bass EB, Guyatt G. How to use clinical practice guidelines. A. Are the recommendations valid? The Evidence-Based Medicine Working Group. *JAMA.* 1995;274:570-574.

VIII. Wilson MC, Hayward RS, Tunis SR, Bass EB, Guyatt G. How to use clinical practice guidelines. B. What are the recommendations and will they help you in caring for your patients? The Evidence-Based Medicine Working Group.) *AMA.* 1995;274:1630-1632.

IX. Guyatt GH, Sackett DL, Sinclair JC, Hayward R, Cook D], Cook RJ. A method for grading health care recommendations. Evidence-Based Medicine Working Group. *JAMA.* 1995;274: 1800-1804.

X. Naylor GH, Guyatt GH. How to use an article reporting variations in the outcomes of health services. The Evidence-Based Medicine Working Group. *JAMA.* 1996;275:554-558.

XI. Naylor CD, Guyatt GH. How to use an article about a clinical utilization review. The Evidence-Based Medicine Working Group. *JAMA.* 1996;275:1435-1439.

XII. Guyatt G, Naylor CD, Juniper E, Heyland DK, Jaeschke R, Cook DJ. How to use articles about health-related quality of life measurements. The Evidence-Based Medicine Working Group. *JAMA.* 1997;277:1232-1237.

XIII. Drummond MF, Richardson WS, O'Brien BJ, Levine M, Heyland D. How to use an article on economic analysis of clinical practice. A. Are the results of the study valid? *JAMA.* 1997;277:1552-1557.

XIII. O'Brien BJ, Heyland D, Richardson WS, Levine M, Drummond MF. How to use an article on economic analysis of clinical practice. B. What are the results and will they help me in caring for my patients? The Evidence-Based Medicine Working Group.)*AMA.* 1997; 277:1802-1806.

XIV. Dans AL, Dans LF, Guyatt GH, Richardson S. How to decide on the applicability of clinical trials results to your patient. *JAMA.* 1998;279:545-549.

XV. Richardson WS, Wilson MC, Guyatt GH, Nishikawa J. How to use an article about disease probability for differential diagnosis. The Evidence-Based Medicine Working Group. *JAMA.* 1999;281:1214-1219.

XVI. Guyatt GH, Sinclair J, Cook DJ, Glasziou P. How to use a treatment recommendation. The Evidence-Based Medicine Working Group and the Cochrane Applicability Methods Working Group. *JAMA.* 1999;281:1836-1843.

XVII. Barratt A, Irwig L, Glasziou P, Cumming RG, Raffle A, Hicks N, Gray JA, Guyatt GH. How to use guidelines and recommendations about screening. The Evidence-Based Medicine Working Group. *JAMA.* 1999;281:2029-2034.

XVIII. Randolph AG, Haynes RB, Wyatt JC, Cook DJ, Guyatt GH. How to use an article evaluating the clinical impact of a computer-based clinical decision support system. The Evidence-Based Working Group.)*AMA.* 1999; 282:67-74.

XIX. Bucher HC, Guyatt GH, Cook DJ, Holbrook A, McAlister FA. Applying clinical trial results. A. How to use an article measuring the effect of an intervention on surrogate endpoints. The Evidence-Based Medicine Working Group. *JAMA.* 1999; 282:771-778.

XIX. McAlister FA, Laupacis A, Wells GA, Sackett DL. Applying clinical trial results. B. Guidelines for determining whether a drug is exerting (more than) a class effect. *JAMA.*1999;282: 1371-1377.

XX. McAlister FA, Straus SE, Guyatt GH, Haynes RB. Integrating research evidence with the care of the individual patient. The Evidence-Based Medicine Working Group. *JAMA.* 2000; 283: 2829-2836.

XXI. Hunt DL, Jaeschke R, McKibbon KA. Using electronic health information resources in evidence-based practice. The Evidence-Based Medicine Working Group. *JAMA.* 2000;283: 1875-1879.

XXII. McGinn TG, Guyatt GH, Wyer PC, Naylor CD, Stiell IG, Richardson WS. How to use articles about clinical decision rules. The Evidence-Based Medicine Working Group. *JAMA.*2000; 284: 79-84.

XXIII. Giacomini MK, Cook DJ. Qualitative research in health care. A. Are the results of the study valid? The Evidence-Based Medicine Working Group. .*IAMA.* 2000;284:357-362.

XXIII. Giacomini MK, Cook DJ. Qualitative research in health care. B. What are the results and how do they help me care for my patients?)*AMA.* 2000;284:478-482.

XXIV. Richardson WS, Wilson MC, Williams JW Jr, Moyer VA, Naylor CD. How to use an article on the clinical manifestations of disease. The Evidence-Based Medicine Working Group. *JAMA.* 2000;284:869-875.

XXV. Guyatt GH, Haynes RB, Jaeschke RZ, Cook DJ, Green L, Naylor CD, Wilson MC. Evidence-based medicine: principles for applying the user's guides to patient care. .*JAMA.* 2000;284: 1290-1296.

XXVI. Jaeschke R, Guyatt G, Sackett DL. How to use an article about a diagnostic test. A. Are the results of the study valid? Evidence-Based Medicine Working Group. *JAMA.* 1994;271:389-391.

XXVII. Jaeschke R, Guyatt GH, Sackett DL. How to use an article about a diagnostic test. B. What are the results and will they help me in caring for my patients? Evidence-Based Medicine Working Group. *JAMA.* 1994;271:59-63.

Part II

Anticipatory Care

Part II

Anticipatory Care

Contents

2.1 Anticipatory Care

Rationale:

- More young persons die every year in Saudi Arabia due to road traffic accidents.
- More than 90,000 persons die before the age of 65 years in the USA per year; out of which:
  - More than 32,000 die due to cancers
  - More than 25,000 die due to Ischemic Heart Diseases (IHD)

- Smoking
  - Main cause of premature death in the Western countries
  - Cessation leads to
    - more than 33% reduction in all type of cancers
    - more than 25% reduction in IHD.

- Hypertension detection and control lead to 50% reduction in Cerebro-Vascular Accidents (CVAs)

- Treating preventable diseases is very expensive

  e.g. Heart disease, Stroke } $ 4 billions /year in USA.

- Budget for prevention is less than 1% of health budgets worldwide.

- Modern doctors make anticipatory care as a part of their daily practice in all specialties.

Definitions:

Health: "A state of complete physical, mental,and social well being and not merely the absence of diseases and infirmity" (WHO, 1947)

Community: group of people who have common characterstics.

Community health (public health): The health status of a defined group of people and the actions and conditions,to promot,protect and preserve their health .

Population health: The health status of people who are not organized and have no identity as a group or locality, and the sections and decisions to promote, protect and preserve their health .

Community health vs. personal health: individual actions and decisions making that the health of an individual or his immediate family while community health are activities aimed to protecting or improving the health of a population or community

Anticipatory Care:

All measures aiming to promote good health and prevent or delay diseases or their complications.

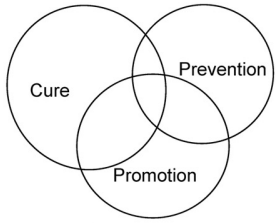


Fig. 8: Anticipatory care

Aim:

- Improve the quality of life.
- Reduce the burden of premature disability
- Increase life expectancy

Classification:

Anticipatory Care

- **Disease Prevention**
  - Primary: Prevention of disease development
    - Health education: Providing the information about conditions that are known to cause disease.
    - Prophylaxis, Vaccination: Protection against particular dise
  - Secondary prevention: (Early diagnosis and treatment)
    - Screening: Systematic attempts to detect undeclared disease in a population apparently healthy or the examination of asymptomatic people in order to classify them as likely or unlikely to have a disease
    - Case finding: screening provided to a single patient presenting to a doctor with some problem
  - Tertiary: Systematic, long term monitoring of patient to prevent or minimize the impact of complications. Not just an opportunistic but with a framework.
- **Health Promotion**

Health Promotion

Definition:

It is a multifactorial process operating on an individual and communities.

- Education
- Prevention
- Protection

} measures

Maintaining good health by avoiding risk factors for diseases.

Aim:

To encourage individuals to attain the best possible level of health and well being of which they are capable.

Disease Prevention

Aim:

Encourage people to assume responsibility for the maintenance of their own health**.** It can be operated on primary, secondary or tertiary, levels:

Examples:

Primary:	regular exercises to prevent IHD
Secondary:	keep follow up for pap smear
Tertiary:	comply with treatment, to limit disability, minimize sufferings and to rehabilitate the patient.

Wilson criteria of screening (1971):

To conduct a screening for a condition, the clinical condition should have the following criteria to be cost effective:

1. The condition should be an important and recognizable at an early stage in its natural history.
2. Screening test should be practicable and acceptable to patients.
3. A recognized selective treatment should exist and facilities for diagnosis and management be readily available.
4. A policy should be established to whom to treat.
5. The cost of screening should be economically balanced against the possible expenditure on medical care.

New Trend in Anticipatory Care

1. ***Changes in the pattern of disease***:

In the past: the high rate of death was due to infectious diseases which was decreased dramatically by:

- Improved housing

- Clean water and sewage disposal

These measures were undertaken by the governments.

Now: the main cause of death is the chronic disease:

- Heart disease
- Cancer
- COPD

These are determined by patient's habits and life styles. The educational role of the physician is central for modifying the behaviour to:

- Healthier life style
- Use of available health services

2. ***Limitation of high technology medicine*:**
   Evidence show that new technologies in medicine like transplantation and dialysis have a limited role in improving health outcomes.

   Life expectancy for a man aged 30 years has increased only by 5% over the past 25 years.

3. ***Pressure on doctors to practise prevention***.

   84% of the patient have found out that discussion on health promotion is useful but should be related to the health problem.

Key areas for action to improve health:

1. ***Causes of substantial mortality:***
   - Coronary Heart Diseases (CHD)
   - Strokes
   - Cancers
   - Accidents
2. ***Causes of substantial ill health:***
   - Mental health
   - DM
   - Asthma

3. ***Factors contributing to mortality, ill health and unhealthy living:***
    - Smoking
    - Diet or alcohol
    - Lack of physical exercise
4. ***Areas of great potential for causing harm:***
    - HIV/AIDS
    - Some communicable diseases
    - Food & water safety
5. ***Areas of clear scope for improvement:***
    - Health of pregnant, infants and children.
    - Rehabilitation services for people having disability
    - Environmental quality

Healthy People 2010 project:

Sets of goals and objectives for the US that defines the nation's health agenda and guides its health policy.

The most important areas for improvement by 2010:

1. ***Heart disease and stroke***
   Target: to decrease by one third

2. ***Accidents***
   Target: to be decreased by 1/5

3. ***Cancers:***
   Target: to be decreased by 1/5

4. ***Mental health***
   Target: to decrease suicide by 1/6

A Systematic pproach for health improvement:

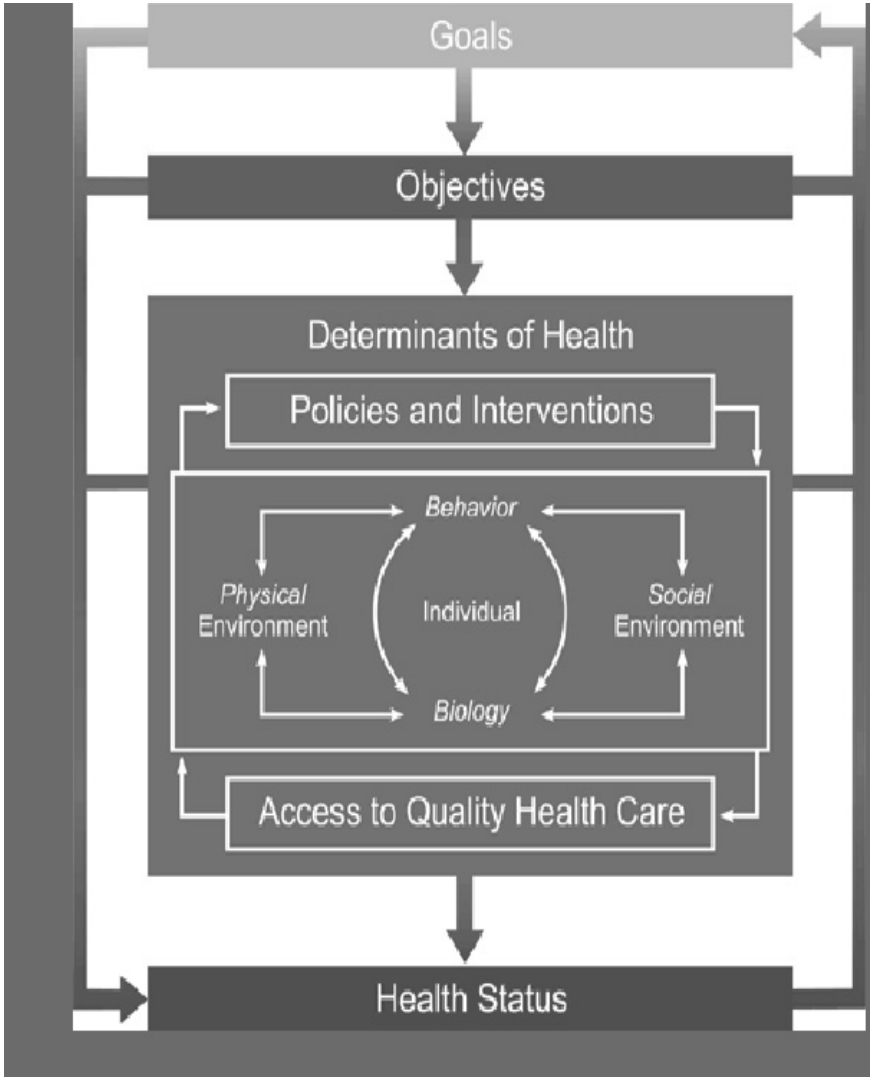


Fig. 9. approach to health improvement (source: U.S. Department of health and human services . Healthy people 2010. available at htt/www. healthypeople.gov)

Role of Family Physician:

Doctors are not "health policemen" but they are supposed to provide patients with appropriate information and advice and to enable them to choose paths of actions for themselves. (*Patients cured care*).
Family Practice is the ideal setting for delivery of effective anticipatory care at primary, secondary and tertiary levels due to:

1. ***Frequent contacts between patient and doctor over many years:***

   - patient/doctor contacts 3-4 times per year.
   - more than 10% of contacts at home (UK)
   - more than 80% of patient consult GP at least 1per year
   - more than 90% of patients consult GP at least 1 per 5 years
   - one million face-face consultation per day in U.K.
   - around 78% of patient remains with same doctor ≥ 5 years
   - around42% of patient remains with same doctor ≥ 20 years
   - minority of patient remains with same doctor for life.

2. ***Responsibility for a defined population***
   - around 98% of population is registered with GP (UK) have chronic disease risk factors

3. ***Contribution of the primary care team:***
   The family Physician is supported by other members of health team

4. ***The power of patient – doctor relationships:***
   The better the relationship, the more likely the patient will comply with advice of a doctor regarding prevention and treatment.

Summary:

1. Anticipatory = Health promotion + prevention
2. Anticipatory care = Prevention + cure + care
3. The answer to present killer is prevention not cure

4. The setting of general practice provide the best opportunity for observing prevention opportunity and implementing preventive actions.
5. The clinician particularly GP must practice, the new role in prevention more actively.
6. Opportunistic anticipatory care initiatives must target receptive individual and avoid preaching

2.2 Periodic Health Maintenance

Physicians should care for their clients to prevent disease and reduce susceptibility (primary prevention) and detect disease early so that therapy may start before irreversible damage occurs (secondary prevention) and treat diseases to reduce disability (tertiary prevention).

Here we are concerned with secondary prevention when periodic health examination concerning early detection of diseases or conditions to reduce the morbidity in the population.
Health maintenance may start as early as pre-marital examination going through family life cycle as neonatal screening, well baby care, school health examination and adult health maintenance examination. This chapter will cover the adult programmes. The early stages will be covered elsewhere in this book.

N. B. Only those practices which are evidence based are going to be mentioned.

1. ALL-AGES

Counseling:

- **Injury prevention**

1. Seat belts
2. helmets – bicycles, motorcycles
3. Smoke detector
4. Firearms – safe storage or removal
5. Interpersonal violence – physical, emotional, sexual.

- **Substance use**

1. Avoid tobacco use
2. Avoid underage drinking and illicit drug use
3. Avoid EtOH use while driving, swimming, boating

- **Sexual behavior**

1. Sexual disease prevention – abstinence, avoid high-risk behavior
2. Unintended pregnancy – contraception

- **Diet and exercise**

1. Limit fat and cholesterol; maintain caloric balance; emphasize grains, fruits, vegetables
2. Women – adequate calcium intake (prevent osteoporosis)
3. Regular exercise

- **Sun-exposure**
  avoid excess mid-day, use protective clothing; avoid sunburn

- **Dental health**

1. Regular visits to dental care provider
2. Daily – brush with fluoride toothpaste

AGES UP TO 24 YEARS

Leading causes of death

- Unintentional injuries – motor vehicle injuries
- Homicide
- Suicide
- Malignancy
- Heart diseases

Counseling

- **Immunizations**
  1. Confirm primary immunizations
  2. Confirm previous infection with chicken poxif no primary infection, consider varicella vaccine
  3. Hepatitis B – if not previously immunized
  4. Rubella – girls older than 12 years old
  5. Consider PPD – imm igrants, TB contacts

- **Chemoprophylaxis**
  Calcium supplementation if dietary intake not adequate

Screening

- Height and weight
- Blood pressure – periodic Blood Pressure for ages older than 21
- Pap smear every 1 to 3 years – if sexually active at present or in past
- Chlamydia screening annually – if sexually active at present or in past
- Rubella serology or vaccination history
- Assess for alcohol drinking

AGES 25 to 64

Leading causes of death

- Malignancy
- Heart disease
- Unintentional injuries – motor vehicle accident
- HIV infection
- Suicide and homicide

Counseling

- **Sexual behavior**
  erectile dysfunction or dyspareunia

- **Immunizations**
  1. Tetanus-diphtheria (Td) every 10 yrs
  2. rubella – women of childbearing age

- **Chemoprophylaxis**
  1. multi-vitamin with folic acid – women planning pregnancy
  2. discuss hormone prophylaxis – peri- or post-menopausal women

Screening:

- Blood pressure
- Height and weight
- Total blood cholesterol – women age 45 to 64, men ages 35 to 64
- Pap smear every 1 to 3 years – sexually active at present or past
- Fecal occult blood test annually and sigmoidoscopy every 3 to 5 years (older than 50 years)
- Mammogram every year (with or without clinical breast exam (CBE) – women age 50 to 69 years)
- Assess for drinking problem
- Rubella (women of childbearing age) – serology or vaccination history

AGE 65 and ABOVE

Leading causes of death

- Heart disease
- Malignancy (lung, colorectal, breast)
- Cerebrovascular disease
- Chronic obstructive pulmonary disease (COPD)
- Pneumonia and influenza

Counseling

- **Injury prevention**
  1. Fall prevention
  2. Set hot water heater to < 50°C
- **Sexual behavior**
  1. erectile dysfunction
  2. dyspareunia
- **Immunizations**
  1. Pneumovax (see Vaccinations for adults)
  2. Influenza annually
  3. Td booster every 10 years
- **Chemoprophylaxis**
  1. Hormone replacement therapy for peri/postmenopausal women

2. Calcium and Vitamin D supplementation – men and women if dietary intake inadequate.

Screening

- Blood pressure
- Height and weight
- Fecal occult blood test (annually) and sigmoidoscopy (every 3 to 5 years)
- Mammogram with or without CBE – unclear after age 70 years; may decrease frequency to every 2 to 3 yrs
- Pap smear – women who are sexually active and/or who have not had three consecutive normal pap smears in the past
- Vision screening
- Assess for hearing impairment
- Assess for drinking problem

HIGH RISK POPULATIONS

- **High-risk sexual behavior:**

  Screen for

  1. syphilis,
  2. Gonococcus
  3. Chlamydia
  4. HIV
  5. hepattis A
  6. hepatitis B

- **Injection or street drug use:**

  Screen for

  1. syphilis,
  2. HIV;
  3. TB;
  4. hepatitis A
  5. hepatitis B

- **Chronic medical conditions:**
    1. PPD test
    2. pneumococcal
    3. influenza vaccines

- **Blood transfusion between 1975-1985**
    1. HIV test
    2. hepatitis B testing
    3. Give hepatitis B vaccine if not immunized

- **Health care people:**
    1. influenza,
    2. Hepatitis A & B vaccines

2.3 Counseling

There is a consensus that 50% of all visits to family physicians are psychosocial or behavioral in origin – and that family physicians can actually deal with more than 90% of all the visits. In order to be effective counselor, the family physician must develop effective communication skills. The patient has to believe in his doctor, have confidence in his advice, reassurance, and acceptance of the therapeutic offers selected by the physicians. Because the family physicians has an intimate relationship with all the family members, he is often the first to be aware of their "interrelationship problems, family discord and he is in a better position to help.

Counseling is an action process requiring the physician to engage the patient therapeutically around a painful life issue. This process requires more than just listening letting patient's to talk freely and supporting the patients even though there are necessary skills but the physician should do more and transcends the techniques.

Characterstics of effective counseling

1. **Encouragement**
   As the patient who has a problem is discouraged, encouragement on the other hand helps him. Encouragement is not merely praising, optimism, positive thinking but it means assuring patient's competency, making that the patient believe in himself, focusing on patient's strengths and giving non-verbal clues being "for" the patient. Qualities that elicit encouragement and make effective counselor are:

   i. Providing non-defensive genuine style of therapy
   ii. Offering a safe, trusting, secure attitude reflection positive regard and involving the patient.
   iii. Understanding and grasping the meanings that the patient sends.

2. **Providing the time needed to counsel in each clinic**.

3. **Use the family as the context**
   Patient's life with family members and their interaction is important to solve and understand his problems are important.

Stages of counseling process

1. **Social stage**
   Includes the establishment of an atmosphere hopefulness and good will. Greeting, responding, hearing the patient, concern and presenting problem and construction of family genogram. Friendly history taking is useful. It will last from 5 – 15 minutes.

2. **Problem stage**
   Talking more on the patient's problem. For example, "what do you expect to change or what do you expect will be different as a result of your coming here".

3. **Interactional assessment stage**
   Which involve assessing the interactional sequence or behavioral chain of events including the present complaints. The principles of circularity, neutrality and hypothesis are important.

4. **Goal setting stage**
   The development of an explicit therapeutic goal with the patient. The goal should be specific and objective.

5. **Intervention stage**
   It is to plan specific intervention staging designed to interrupt the interactional patterns associated with symptoms. Specific homework assignments which when followed will guide the patient directly to the stated goal.

Counseling techniques

1. Cognitive techniques (comnlly used in family medine)
2. Encouragement – inducing techniques

3. Conflict – resolution techniques
4. Reframing - relabeling techniques
5. Anxiety – reducing techniques
6. Anxiety provoking techniques
7. Reparative technique

Summary

Effective counselor should do:

1. Search for competence in the patient and build on patient's strengths.
2. Understand the system – letting interactional hypothesis guide the investigation.
3. Avoid playing the patient's games. The patient is the expert.
4. Work only one matter at a time.
5. Assume that the patient is not fragile.
6. Develop a unique style of one's own. A successful counselor requires, a blending technique and not a ready made "cookbook"
7. Use homework assignments or tasks to extend treatment beyond the clinic.

2.4 Screening

Definitions:

1. WHO and US commission on chronic illness, defined screening as:
   "The presumptive identification of unrecognized disease or defect by the application of tests, examinations or other procedures which can be applied rapidly. Screening tests sort out apparently well persons who probably have a disease from those who probably do not. A screening test is not intended to be diagnostic. Persons with positive or suspicious findings must be referred to their physicians for diagnosis and necessary treatment"

2. Mckeown defined screening as:
   "Any medical investigation which does arise from a patient's request for advice of a specific complaint".

3. Screening is an initial examination only, and positive responders require a second diagnostic examination, the initiative for screening usually comes from the investigator or the person or agency providing care rather than from a patient with a complaint. Screening is usually concerned with chronic illnesses and aims to detect diseases not yet under medical care.

Types:

1. **Mass screening** simply means screening of the whole population. Multiple or multiphasic screening involves the use of a variety of screening tests on the same occasion. Prescriptive screening has as its own aim of the early detection in presumptively healthy individuals of a disease that can be controlled better if detected early in its natural history.

2. **Case finding,** on the other hand, was defined by Holland and Sackett as the process whereby patients who have sought health care

are tested**,** with their consent, for disorders which may be unrelated to their presenting complaint.

Criteria for Screening

1. ***Wilson*** **and** ***Jungners*** have pointed out that the introduction of a screening program should have ten criteria:

1. The health problem should be an important one.
2. The disease should have an acceptable form of treatment.
3. There should be diagnostic and treatment facilities available.
4. There should be a recognizable latent or early asymptomatic phase of the disease.
5. There should be a suitable test or examination (valid, reliable, acceptable and inexpensive).
6. The screening should be acceptable to the population being surveyed.
7. The natural history of the disease or the condition should be understood.
8. Agreement should be reached to whom to treat.
9. The cost of the screening should not be more.
10. The case finding should be a continuous process.

2. ***Grant*** has suggested three conditions to be satisfied for the screening of disease that could medically, socially, and economically be justified:

1. The methods should be valid and reliable.
2. The number of positive findings must commensurate with the cost.
3. Evidence is needed that diagnosing the disease before symptoms appear will improve the prognosis.

Assessment of Screening Test:

Two main criteria are needed for the evaluation of a screening test: VALIDITY and RELIABILITY or REPEATABILITY.

1. Reliability

A reliable screening test is one which gives consistent results when the test is performed more than once on the same individual under the same conditions. Two major factors affect re1i abi1ity:

a. Variation inherent in the method and,
b. Observer variation.

The variability of a method depends upon such factors as the stability of the reagents used and the fluctuations in the substance being measured (diurnal variation)

Observer variation on the other hand, can stem from differences among observers (inter-observer variation), or from variation in the reading by the same observer on separate occasions (intra-observer variation)

These variations can be minimised by careful standardisation of procedures, by an intensive training of all observers by periodic checkups on their work, and by the use of two or more observers making independent observations.

Validity

Validity is the ability of the test to measure what it supposes to measure.A screening test should provide a good preliminary indication of which individuals actually have the disease and which do not.The test should be cheap, simple, and quick and so it is not the best diagnostic measure of a disease.Its validity may be assessed by comparing it with the results of a reference test (GOLD STANDARD).The extent to which the screening test results agree with those derived by the reference test provides a measure of Sensitivity and Specificity. These are the two components of validity of a screening test.

1. **SENSITIVITY**: is the ability of the test to identify correctly those who have the disease.
   It is expressed as a percentage:

$$\frac{\text{Persons with the disease detected by screening test}}{\text{Total number of persons tested with the disease}} \times 100$$

2. **SPECIFICITY:** is the ability of the test to identify correctly those who do not have the disease.
   It is expressed as a percentage:

$$\frac{\text{Persons without the disease who are negative to the screening test}}{\text{Total number of persons tested without the disease}} \times 100$$

3. **Computation of sensitivity and specificity**
   From the following Table, you should be able to calculate sensitivity and specificity.

	True diagnosis		
Test Result	**Diseased**	**Not Diseased**	**Total**
Positive	a	b	a + b
Negative	c	d	c + d
Total	a + c	b + d	a+b+c+d

Table 8. A general representation of screening matrix

From the above table:

$$\text{Sensitivity} = \frac{a}{a + c} \times 100$$

$$\text{Specificity} = \frac{d}{b + d} \times 100$$

a = True positives
b = False positives
c = False negatives
d = True negatives

1. A test that is very sensitive has few false negatives, that is (c) is small as the sensitivity approaches 100%.

2. a very specific test has few false positives, that is (b) is very small as specificity approaches 100%.

3. A valid screening test is the one which has both high sensitivity and high specificity. But, usually a sensitive test is not very specific and vise versa. A frequency distribution of a test used for screening may look like (Fig. 1) - there being an overlap between cases and non cases.

4. If the discriminating level is set at (X) all the cases will be picked up and the test will be very sensitive, but on the expense of picking up many non-cases and call them positives (low specificity)

5. If the level is set at (Y), the test will be very specific but on the expense of low sensitivity, that is many cases will be missed by the test.

6. depending on the disease and the consequences of its detection, a cut-off point is made somewhere between (X) and(Y).

7. Because the number of cases in a population is usually much smaller than the number of non-cases a positive test may include more people who do not have the disease than those who actually do have the disease.

8. the positive predictive value is a very useful measure to make when considering the value of a screening test.

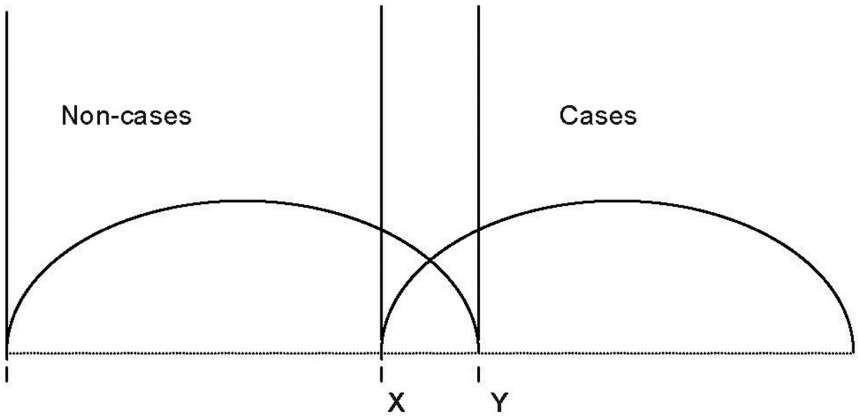


Fig. 10. Screening Test.

Predictive Values of Screening Tests

In clinical situations it is not sufficient to know only the levels of sensitivity and specificity. In addition the clinician needs to know the likelihood that a person with a positive test result actually has the disease, i.e. the positive predictive value or on the other hand there is a likelihood that a person with a negative test results do not have the disease. i.e. the negative predictive value.

Using (Table 8):

Positive predictive value = a/a+b

Negative predictive value = d/c+d

In contrast to sensitivity and specificity**,** the predictive values of a test depend on the prevalence of the disease.

This is very important, phenomenon as the test may be very sensitive and specific, but because of its low prevalence, the false positives will be very high, but the predictive value in this case will be low.

Evaluation of a Screening Service

The ideal screening programme is one in which a cheap and safe test identifies a large group of people in whom prognosis is bad and treatment is effective.

Two important issues need consideration when assessing a screening programe:

1. **Cost of the test:**
   Cost need to be measured regarding the patient, in terms of time lost, discomfort and anxiety, and regarding the resources of the health servirces.

2. **Yield of the test:**
   It is defined as the amount of previously unrecognized disease which is diagnosed and brought to treatment as a result of screening. It depends on many factors:
   - The sensitivity of the test.
   - Prevalence of unrecognized disease.
   - Extent of previous screening.
   - Health behaviour and the uptake of the screening service by the relevant population.

Problems with Screening

Screening is a good service when it meets the criteria mentioned before, but at times some problems can be associated:

1. Creating unnecessary anxiety to the community due to low specificity of the test, and high false positive rate.

2. Causing more morbidity by using unsafe or invasive tests.

3. The uptake of screening is usually low for those who need it (The uptake of cervical smear is usually low for low socio-economic status women who are actually in need).

4. Cost and other administrative problems can make screening services, although needed, unfeasible.

Tobacco Use

Definition:

Smoking: The direct inhalation of tobacco smoke regularly or habitually from a cigarette, cigar, or pipe:

Tobacco: A South American herb, formally known as Nicotiana tabacum, whose leaves contain 2-8% nicotine and serve as the source of smoking and smokeless tobacco.

Smokless tobacco: snuff and chewing tocaco.

Epidemiology:

- Single largest cause of a preventable death worldwide.
- In USA 27% of adults and 22% of high school students smoke.
- Smoking is estimated to cause over 4500,000 deaths annually in U.S.A.
  - 40% due to vascular diseases.
  - 35% due to cancer.
  - 20% due to respiratory diseases.
  - 5% due to cerebrovascular diseases.
- Approximately 3,000 children and adolescent become regular users of tobacco everyday in U.S.A.
- In the U.K. 29% of adults smoke cigarette, 82% of smokers start as teenagers.
- In Saudi Arabia, the prevalence of smokers is 21% for males and 0.9 for females. Most of them are between 21-50 years old. Smoking is more among married than illiterates.
- There is a link between cigarette smoking and cancer, atherosclerotic diseases, COPD, gastritis, skin and connective tissue diseases.
- Smoking cessation benefits all age groups and extends to those individuals already affected with smoking-related diagnosis.

- Evidence suggests that smoking cessation is more likely when physician actively identifies a smoker and encourages cessation.
- 70% of smokers want to quit and have made at least one self-described attempt.
- Most smokers make more than 5 attempts before cessation succeeds.

Interviewing of smokers:

Aim:

To establish rapport
To explore the level of smoking dependency
To guide management

Biodemographic data:

Name, age, occupation, marital status.

Identify smokers:

Identify all tobacco users in every visit, you might record smoking-status as the 5th vital signs (e.g. smoking currently: yes/no)
Ask specifically about smoking in consultations concerned with related diseases e.g. coronary heart disease, asthma, pulmonary disease, cancer and amongst priority group of adolescents.

Assessment

Aim:

To identify highly dependent smokers. This will guide your management.

Highly dependent smokers

1. Smoke >20 cigarettes a day.
2. Smoke within 30 minutes after getting up.

3. Significant withdrawal symptoms and early relapse (within one week) of previous attempt to quit.
4. Significant psychiatric disorders (e.g. depression, schizophrenia).
5. Alcohol or drug dependence.

Approach for smoking cessation

1. Identify all tobacco users at your practice.
2. Strongly urge all smokers to quit: simple advice from a GP about smoking cessation results in 2% of quiting.
3. If smokers do not want to quit:
   - Explain the harmful effects of smoking and back-up your information with a health education leaflet.
   - Record the advice in the notes and try again at the next visit.
4. If smokers are willing to make a quit attempt, do the following steps:

Step I: Stress benefits of giving-up

Short term:	Financial gain Regaining of sense of taste/smell
Long term:	Reduction in cancer incidence. Reduction in atherosclerosis Reduction in COPD
Others:	Benefit if not smoking in pregnancy Benefit to other family members

Step II: Assist smokers with a quit plan

1. ***Set date for quitting***:
   Invite smokers to pick a good date to become non-smoker e.g. low stress day without social pressures to the smoker. Ideally the date should be within 2 weeks.

2. ***Help prepare for quitting***
   Patient should inform family, friends and co-workers.
   Prepare environment: remove cigarettes, pipes, ashtrays, matches, lighters, etc. Prior to quitting, avoid smoking in places where one will spend a lot of time e.g. car and office.

3. ***Keep a smoking sheet***. Record times and situations that trigger smoking, to avoid these situations, if possible.

4. ***Review previous quit attempts:***
   Explore the following points:
   nature?
   number?
   what has led to relapse?

Step III*:* Practical counseling and skills training:

1. Total abstinence is essential.
2. Anticipate triggers or upcoming challenges.
3. Abstain from alcohol.
4. Identify alternative behaviors in place of smoking. Example: chewing gum, activities with hands e.g. Mosbahah, Moswak, etc.

Step IV: Support the smokers

1. Provide and show videotapes that model support skills.
2. Encourage smokers to establish a smoke-free home.
3. Inform patients about community resources (hotlines, help lines, etc.)
4. Request social support from family, friends and co-workers).

Step V: Encourage pharmacologic treatment

A . Over the counter (OTC)

- ***Nicotine gum***:

- 2mg/piece if < 25 cigarette/day
- 4mg/piece if >25 cigarette/day
- Chew each piece slowly until feel tingling (indicates nicotine release).
- Hold the gum between cheek and the gum for several minutes (allow for absorption).
- Chew again.
- Continue for 30 minutes per piece.
- Take 1-2 piece per1 hour
- Duration: 3 months (6 weeks steady and 6weeks for tapering).

- ***Nicotine patches:***
  - 24-hour patches: 21 mg/24 hours for 6 weeks
    then 14 mg/24 hours for 2 weeks
    then, 7 mg/24 hours for 2 weeks
    Total 10 weeks
  - 16-hour patches (to avoid insomnia):
    15 mg/16 hours for 6 weeks
    then 10 mg/16 hours for 2 weeks
    then 5 mg/16 hours for 2 weeks
    Total 10 weeks
  - Heavy smokers: if > 2 packs per day consider doubling initial dosing (42 mg/24 hours or 30 mg/16 hour)

B . Prescription requiring:

Nicotine nasal spray:

- Mimics rapid rise of nicotine in blood stream
- 1-2 doses/hour for 3 months: 1 spray (0.5 mg) into each nostril equals one dose (1 mg)
- Don't exceed 5 doses/hour or 40 doses/day
- Spray against the lower nasal mucosa
- Do not spray or sniff into the upper nasal passages (where it is not well absorbed)
- Side effects (diminish with time)
  - Nasal and throat irritation
  - Rhinitis

- Sneezing
- Coughing
- Watering from eyes

Nicotine inhaler

- Plastic rod with nicotine plug providing nicotine vapor. (Substitutes for behavioral feature of smoking).
- Deliver nicotine buccally, not in lungs (like gums).
- 6-16 cartridges/day (10 mg per cartridge) for 3 months.
- Side effects:
  - Mild throat irritation
  - Coughing

Bupropion

- Atypical antidepressant: both dopaminergic and adrenergic properties.
- 150 mg po or qd for 3 days, then (if tolerated) increase to 150 mg po BD for 7 – 12 weeks.
- Overlap bupropion and smoking one week i.e. quit smoking in treatment day no. 8.
- Side effects
  - Insomnia (take evening dose before 5 p.m.)
  - Dry mouth
  - Seizure: (↓ threshold of seizure at 300 mg/day) *avoid if history of seizure, eating disorder, heavy alcohol use, or CNS trauma or head injury with loss of consciousness.*

Choice of treatment plan is based on:

- Previous failed attempt: repeating the same method rarely successful, so suggest a new treatment.
- Patient preference: should dictate choice of drug therapy.

Success rate:

- In specialty clinics, with intense counseling and motivated population placebo absence rate after one year is 10%.
- NRT: double absence rate of placebo (20%)
- Bupropion: absence rate: 30%
- Bupropion + NRT: Increase cessation rate.

Treatment warnings:

- ***Heart disease:***
  Not less harmful than tobacco, however, NRT + cigarette smoking increase the risk more than the either alone.
- ***Pregnancy:*** NRT less harmful than cigarette smoking.
- ***Combining NRT therapies:*** patch and gum can increase the efficacy without increasing side effects.
- ***Continuing smoking with NRT***: does not increase morbidity.
- ***Drug metabolism:*** non-nicotine compounds in cigarettes may increase the metabolism of certain medication e.g.
  - Theophyllin
  - Tricyclic antidepressants

  smoking cessation may decrease the level of these medications.

Step VI: Arrange for follow-up

Timing:

- Soon after scheduled quit date ideally, within 1st week.
- 2nd visit within 1st month
- Can be through personal contact or telephone.

Action:

- Congratulate success
- If smoking reccurs – review circumstances and elicit recommitment of total abstinence and search for co morbid psychiatric problems (alcohol or depression).
- Lapse is not failure – but can be a learning experience.
- Assess pharmacologic therapy
  - Compliance
  - Side effects
  - Adequate dosing

Treatment duration:

Generally, continue as long as patients feel they need it provided abstinence is maintained (the recommended duration is mentioned in front of each type –see above).

Step VII: Referral

- If pharmacologic therapy unsuccessful
- If no facilities available for counseling

Important Point to remember:

- Most patients will attempt smoking cessation several times before they are successful.
- Rapidity of nicotine delivery to blood stream is as follows: Patch < gum & inhaler < nasal spray < cigarettes.
- Most of the patients initially attempt smoking cessation on their own without any intervention.
- Only about 7% of smokers achieve long term success when they are trying to quit on their own, success rate increases to 30% by using appropriate therapies.
    - Even brief physician interactions of 3 minutes or less result in 10% quit rate.
- For every 4-5 patient's encounter to quit smoking, one life will be saved.
- Nearly 43% of children 2 months to 11 years live in homes with at least one smoker.
- Evidence suggests that smoke exposure during childhood is associated with increased illnesses including: upper and lower respiratory diseases. Middle ear infections with effusions, asthma and sudden infant death syndrome.

Immunization

Types of immunity:

- **Passive:** prevention provided by antibodies from another organism.
  - e.g - Maternal antibodies to newborn.
  - - Human immunoglobins
  - - Serum
- **Active:** Activate production of humeral antibodies to antigens.

  Active immunity last longer and reach to a higher level in re- exposure compared to passive immunity.

Types of vaccines:

1. Inactivated (killed)
2. Live
3. Attenuated (altered)
4. Toxoids

Childhood Immunizations

Expanded Program on Immunization (EPI) is one of the most successful preventive measures. In USA, the number of reported cases of polio was more than 20,000 in 1954, but in 1994 there were no reported cases. Hence, every effort should be done to immunize all the children and a lot of false contraindications should be removed.

Table 10. Essential immunization schedule in Saudi Arabia (2009)

Age month	**Vaccine**	**Type**	**Dose ml/ drops**	**Route**	**Site**	**Usual reaction**
Birth	BCG	Live attenuated	0.05	I. D	Deltoid insertion	Ulceration
	Hepatitis B	Inactivated viral	0.5	I.M	Outer part of thigh	Soareness
2	DTP	DT:bacterial toxoid P:Killed bacterial	0.5	I.M.	Anterolateral aspect of thigh	Redness, pain, swelling, fever
	Hib	Capsular polysaccharide linked to carrier protein	0.5	I.M.	Anterolateral aspect of thigh	Redness, fever
	Hepatitis B	Inactivated viral	0.5	I.M	Outer part of thigh	Soareness
	IPV	Inactivated	0.5	I.M	Anterolateral aspect of thigh	None
	PCV	Polysaccharide	0.5	I.M.	Anterolateral aspect of thigh	None
4	DTP Hib Hepatitis B OPV PCV	Live oral	2 drops	Oral		
6	DTP Hib HepB OPV PCV					
9	measles	Live attenuated	0.5	S.C.	Anterolateral aspect of thigh	Fever, rash, lymphadeno-pathy arthralgia

Age month	**Vaccine**	**Type**	**Dose ml/ drops**	**Route**	**Site**	**Usual reaction**
12	MMR OPV Varicella PCV	Live attenuated Live attenuated	0.5 0.5	S.C. S.C.	Anterolateral aspect of thigh	Fever, rash, lymphadeno-pathy arthralgia
18	DTP Hib OPV Hepatitis A	Inactivated	0.5	I.M		
2 yrs	Hepatitis A					
4-6 yrs	DTP/DT OPV MMR varicella					

P.S. In case of the use of Pentavalent vaccine (DPT, Hib & Hep-B) the dose is 0.5 ml and route is I.M.

Footnote: BCG: Bacillus Calmete – Guerin**,** DTP: Diphtheria, Tetanus, Pertussis**,** Hib: Haemophilus, Influenza type b**,** OPV: Oral Polio Vaccine (sero type 1, 2, 3)**,** MMR: Measles, Mumps, Rubella, HepB: Hepatitis B virus, IPV: Inactivated Polio Vaccine, PCV: Pneumococcal Conjugated Vaccine

Table 11. **Contraindications and Precautions to Immunization**

Vaccine	**True Contraindications**	**Precautions**	**Not true Contraindications (myths)**
All vaccines	Anaphylactic reaction to previous dose of vaccine	Moderate or severe illness with or without fever	Mild to moderate local reactions to previous injection of vaccine. Mild acute illness with or without fever. Current antimicrobial therapy. Convalescent phase of an acute illness. Prematurity. Recent exposure to infectious disease. Personal or family history of allergy.
DPT	Anaphylactic reaction to previous dose of vaccine	Hypotonic-hyporesponsive state within 48 hrs of DPT injection usually after second dose.	Fever ≥ 40.5 oC after ***prio***r dose of DPT. Family history of sudden infant death syndrome. Convulsion within 48 hr of prior dose of DPT. Family history of convulsions Persistent inconsolable crying lasting ≥ 3 hrs within 48 hrs of immunization with DPT.
IPV	Anaphylactic reaction to neomycin		
OPV	• with HIV or household contact with HIV • Immunodeficiency state. • Immunodeficient household contact	Pregnancy	• Breast-feeding • Current antimicrobial therapy • Diarrhea

MMR	• Anaphylactic reaction to previous dose or to neomycin • Pregnancy • Immunodeficiency state	Recent administration of Immunoglobins (IgG)	• Tuberculosis or positive TB skin test. • Simultaneous TB skin testing. • Current antimicrobial therapy. • Infection with HIV. • Egg allergy.
Hib			
Hep B			Pregnancy
BCG	• Immuno-suppression • Burns/extensive active skin disease • Positive Tuberculin Skin Test	• Pregnancy • Do not give with a live virus vaccine • Do not give within 4 weeks after any live vaccine • Patients receiving antituberculosis drugs	
Influenza	Anaphylactic reaction to egg ingestion		Pregnancy

DPT = Diphtheria, Pertussis and Tetanus vaccine
IPV = Inactivated poliovirus vaccine, MMR = Measles, Mumps and Rubella vaccine
Hib = Haemophilus influenzae type b conjugate vaccine

Source: Canadian Immunization Guide

Procedures

1. Check the patient's file
2. Observe the patient: well / ill looking
3. Consent (verbal)

4. Check the immunization schedule.
5. Check the vaccine expiry date.
6. Check that resuscitation facilities are available.
7. Check manufacturer's instructions (if you are not familiar with the dose of vaccine)
8. Record vaccination date and site.

Storage

- Manufacturer's recommendation should be observed.
- Do not store in the door of fridge.
- Record readings regularly.
- Assign one person to be responsible for handling vaccines.
- Follow the Saudi MOH guidelines for cold chain (*cold chain: a system for storing and distributing the vaccines under the correct temperature and way from the factory till the child is vaccinate.*

Quick review

- No relationship between Diabetes Mellitus and vaccinations.
- No relationship between influenza vaccine and Guellian-Barre syndrome.
- No relationship between MMR and autism.
- No relationship between DTP and sudden infant death syndrome (SIDS).
- Rotavirus vaccine has been withdrawn from the market because it causes intussusception.
- Heptavalent pneumococcal conjugate vaccine (PCV) was licensed in US during the year 2000 covering the seven serotypes. Accounts for about 80% of infection in children less than 6 years old. Recommended to high risk groups including sickle cell disease, HIV, chronic diseases.
- Meningococcal vaccine recommended in Saudi Arabia is: Quadrivalent polysaccharides (A, C, Y, and W135).

Management Anaphylaxis

1. Quick assessment and sustained Airway, breathing and circulation.

2. Give adrenaline (epinephrine) if patients has signs of shock, airway swelling or breathing difficulty (dose: 1: 1000) 0.01 ml/kg i.m
   - Repeat dose ≥ 5 min if no improvement.
   - Give antihistamine chlorpheniramine (Benadryl) 1-2 mg/kg i.m or IV
   - Give hydrocortisone I.V. 1-5 year 50 mg 6-11 years 100 mg, (> 11year 100-500 mg)
   - Give salbutamol nebulizer (ventoline) if there is bronchospasm
   - If hypotensive: infuse normal saline 1-2 L for adult (children 20 ml/kg) repeat if no response
   - Admit to hospital
   - Follow-up
   - refer patient to an allergy specialist
   - Educate parents
   - Give epinephrine kit
   - Mark the file
   - Advice sufferers to wear a device (e.g. card or bracelet).

Adult Vaccination

Important Points

1. Past history and anaphylactic reaction to egg
   → No influenza vaccine
   → No MMR vaccines
2. Immunocompromised patient → No live vaccines
3. HIV + ve (asymptomatic) → MMR can be given
4. Pregnancy → No live vaccine
   → Household contact can be vaccinated

Adult vaccination schedule

Vaccine	Indication	Dose	Route	Contra-indication	Schedule
Influenza "Annually"	• > 65 years old • Chronic disease • Resident in chronic care center • Health care providers • Pregnant with cardiac/ pulmonary problems	0.5cc	I.M.	History of anaphylaxis of eggs	• Annually (Mid October to Mid November). New vaccine each year based on prediction of prevalent strains. • Pregnant: anytime but 1st or 3rd trimester
Pneumo-coccal	• ≥ 65 years old • Chronic disease • Resident in chronic care center (> 50 years old)	0.5 cc	SC I.M.		• Once • Aspleenia: revaccinate every 5 years • >75yearss revaccinate after 5 years
Tetanus & Diphtheria (TD)	• All adults	0.5 cc	I.M.		• 3 doses + bosters • 1st dose • 2nd 4-6 wks • 3rd 6-12 wks • Every 10 years
MMR: Measles Mumps Rubella	• No documented immunity	0.5 cc	I.M.	• History of anaphylaxis to egg. • Pregnancy (no pregnancy within 3 months of vaccine)	• 2 doses

Varicella	• No history of chicken pox • Health care providers • International travelers • Women in child bearing age who are not pregnant • Family contacts of immuno-compromised patients	0.5 cc	S.C.		• 2 doses (4-8 weeks apart)
Hepatitis A	All adults at high risk: • Live or travel to endemic area • HIV/AIDS • Chronic liver disease • Military personnel • Institutional-ized individuals	1440 U in 1 cc	I.M.		2 doses (6-12 weeks apart)
Hepatitis B	All not previously vaccinated high risk: • Health care workers • Household or sexual contact of HB carrier • Prison intimate • HIV/AIDS • Chronic liver disease • Recipient of blood products • Hemodialysis patient	20 mcg/ cc	I.M./ S.C.		3 doses (0, 1 month, 6 month)

Part III

Approach to Common Health Problems

Part III

Approach to Common Health Problems

Contents

Fever

Definitions:

- **Normal body temperature**: is 37 degrees Celsius (^{o}C) or 98.6 degrees Fahrenheit (F)
- **Fever:** is a temperature greater or equal to 38^{o}C or 100.4 ^{o}F using rectal temperature measurements.
- **Rectal temperature** equals oral temperature + 0.6^{o}C (1^{o}F)
- **Rectal temperature** equals Axillary temperature + 1.1^{o} (or 2^{0}F)
- **Fever of unknown origin:** illness lasting for more than 14 days without any obvious cause associated with a fever above 38^{o}C on at least four occasions over a 14 days period.

Prevalence:

Fever is the 14th most common presenting symptom in family medicine clinics or phone calls.
The complaint crosses all age groups, both sexes.
It is less evident at the extremes of age.

High Risk:

1. Any toxic appearance regardless of age.
2. Any one with a temperature above 40^{o}C (105 ^{o}F) regardless of age.
3. Neonates with a temperature above 38^{o}C (100.4^{o}F).
4. Children (3 month – 6 years) with a temperature above 39^{o}C (102.2^{o}F).
5. Infants (1-3 months) with a temperature above 38^{o}C (100.4^{o}F).
6. Children with a temperature above 38^{o}C for longer than 24 hours with no associated symptoms or no improvement with home treatment.

7. Temperature above 38.3°C (101 °F) at least 4 times over 14 days illness lasting more than 14 days with no obvious cause.
8. Unexplained fever lasting more than 24 hours.

Risk factors:

1. Chronic health problems e.g. Diabetes Millitus,alcoholism.
2. Non-immunized child.
3. Malignancies.
4. Family history of connective tissue diseases.
5. Contact with febrile patient or animals.
6. Recent travel.
7. Homosexuality.
8. Occupation.
9. Internal prostheses.
10. Indwelling catheter
11. Corticosteroids

Differential diagnosis:

1. Over clothing
2. Infection (viral illnesses are the most common)
3. Drugs including vaccinations
4. Soft tissue injury or inflammation
5. Autoimmune disease
6. Malignancy

Interviewing

Aim:

1. To rule out serious underlying causes
2. To establish diagnosis
3. To establish/maintain rapport
4. To guide management

Bio-demographic data

Name:

Age: clinical approach will vary by age. It is more serious at the extreme of ages (newborn and elder).
The most common age categories being:
- Birth to 3 months
- 3 months to 3 years
- 3 years and older

Job: To explore job related illness e.g. if he/she has contact with animals.

Chief complaint:

- **Fever:** Onset
  How temperature was taken
  The grade of the fever
  Pattern of the fever (variation)

History of presenting illness:

- **General condition**: ill or well
- **Child:** pulling ear.
  decrease oral intake
  diarrhea (number of diapers changed).
  Status o dehydration
  Refusal to walk (Joint pain)
  Activity level
  Oral intake
  Associated symptoms:
- **Respiratory symptoms:**
  Rhinorrhea
  Sore throat
  Otalgia
  Cough
- **Gastro-intestinal infections:**
  Diarrhea
  Vomiting
- **Genito-urinary** Dysurea
  Frequent urination
- **Skin:** Rash: - Skin Infection
  - Meningitis

- Jaundice: Hepatitis

• **Lethargy Or irritabilty**	might indicate serious conditions e.g. Meningitis
• **Night sweating**	might indicate Cancer, TB or Brucellosis.
• **Weught loss**	might indicate ca, TB,
• **Joint pain:**	Rheumatological disease, rheumatic fever, brucellosis.

System involved:

All system can be involved. Thus you need to review all the systems.

Complications (Impact): Depend on the underlying cause

- Missing school or work
- Decrease level of daily activity
- Spreading of infectious disease in the community e.g. outbreaks of measles or chickenpox.

Past Medical History

Medical:	D.M., cancer, etc.
Similar problem:	
Infectious disease:	T.B.
	Brucellosis.
	HIV
Surgical:	Recent surgery
	Trauma or injury

Family History: Similar problems
Rheumatological disease
Infectious disease

Drug history:

Self prescribed Over the counter drugs

	Prescribed:	Dose Frequency Side effects
	Abuse:	Steroid I.V. drug abuse Others
Lifestyle:	**Smoking:** type, duration, amount (opportunistic health promotion)	
	Alcohol: CAGE questionnaire: might indicate alcoholic hepatitis.	
	Hobbies e.g. animal contact, might indicate brucellosis.	

Psychosocial:	**Idea:**	Patients' or caregivers' understanding of feve e.g. It is caused by sun exposure It can be serious e.g. Meningitis Some patient think that fever is treated by antibiotics
	Concern:	Patient/family may worry that: Fever can cause seizure or brain damage They might worry of meningitis They might worry that other family members or visitors will also get sick
	Expectation	Patient might expect full investigation Patient might expect a medicine that makes his/her fever go down Patient might expect admission
	Effect:	See the possible complications above.

Psychological History:

Fictitious fever:

It is uncommon in pediatric age group but can occur in adolescent and adult.

Depression, anxiety and stress:

You need to treat your patient as a whole and screen him/her for possible psychiatric illnesses especially to those related with the underlying condition and its impact.

Support system*:*

screen for any source of support e.g. family members, friend, agencies, etc.

The patient may not come for follow-up because of transportation difficulties

The patient may not have the facilities of checking his/her temperature.

The patient or care giver may not have access to telephone.

Medications might not be taken owing to lack of resources.

Hidden agenda:

Check if your patient or caregiver have any other concerns or worries regarding the fever and its possible causes.

Physical Examination

Aim:

- To detect signs of serious conditions
- To determine patient's activity and comfort
- To narrow the list of differential diagnosis
- To guide management plan (Investigations, antibiotics)

General observation of the patient

- This is especially important in children; to suspect serious bacterial infections; if child is well looking, pink, alert, well hydrated smiling is less likely to have serious underlying cause.However, if child is pale, lethargic, dehydrated, dull or irritable, the physician should have a high suspicion of serious bacterial infection.

Vital signs

i. Temperature:

Oral: Older children and adults

Rectal: Infants and toddlers

Temperature chart *(draw to identify the fever pattern)*

Intermittent
Undulant
Continuous
Remittent

ii. Pulse:

Tachycardia out of proportion to the temperature elevation suggest the presence of sepsis

Bradycardia (typhoid fever)

iii. Respiratory rate*:*

Tachypnea out of proportion to the temperature elevation suggest presence of:

- Sepsis
- Myocarditis.
- Pericarditis
- Pneumonia.
- Bronchiolitis

Weight*:* Especially in children to evaluate dehydration and to guide dosing and I.V. fluid.

Table 13. Systematic examination as follows:

***(N.B**. in children start with auscultation and end by ear examination)*

Body region or system	**Physical finding**	**Potential disease**
Skin	Petechial rash Maculopapular rash, followed by petechial rash	Meningo-coccemia Rocky Mountain spotted fever
Head	Bulging fontanelle, nuchal rigidity	Meningitis(later manifestation in child under 2 yrs of age
Eyes	Conjunctivitis	Associated with otitis media, Kawasaki's disease, or measles with cough.
Ears	Red, dull, nonmobile tympanic membrane	Otitis media
Nose	Purulent rhinorrhea Nasal flaring	Sinusitis Pneumonia or any condition producing respiratory distress
Throat	Stridor Stridor with drooling saliva and dysphagia, or aphonia Petechiae on soft palate and uvula Vesicles or ulcers on soft palate and tonsillar pillars Vesicles or ulcers on tongue, lips, and buccal mucosa Strawberry tongue	Laryngotracheobronchitis (croup) Epiglottitis Streptococcal pharyngitis Herpangina Herpes stomatistis Streptococcal pharyngitis or Kawasaki's disease

Chest	Tachypnea, retractions, decreased breath sounds, rales (may not be present) Rhonchi Wheezing	Pneumonia Bronchitis Bronchiolitis, asthma (inhaled foreign body or other cause)
Heart	Murmur	Sub acute bacterial endocarditis, rheumatic fever (or normal due to increased cardiac output)
Abdomen	Local tenderness worsening with movement	Appendicitis or condition producing peritoneal irritation
Rectal	Fluctuant mass	Ruptured appendix or per rectal abscess
Musculoskeletal	Refuses to bear weight or use extremity	Septic arthritis or osteomyelitis, especially in the hip

Management:

Clarification (Education)

Family physician should provide patients with essential information about fever, home care and use of medical services including:

How to measure temperature
Appropriate use and dosing of antipyritics
Symptoms seeking immediate medical care
Effect of fever on chronic health conditions
Appropriate treatment for viral illness
Appropriate use of antibiotics

Reassure:

Depends on the underlying cause.

If it is self limiting explain and reassure him or her.

If it is serious reassure him/her that patient will have the best available care

Reassure parents that they are able to carry out the treatment plan

Advise to:

Remove clothes

Use sponge

Come to professional care when there is a red flag.

If child has chronic problem e.g. diabetes or asthma caregiver should seek immediate advice.

Adult should seek care when he /she has a fever if it is not relieved in a couple of days or if it interferes with his/her daily activities.

Prescribing:

Appropriate Antipyretics

Antibiotics according to the underlying cause (if signs of meningitis or seriously ill, start antibiotic and do culture)

Referral:

For hospitalization

For further evaluation

For further treatment

According to the underlying cause

Investigations:

- ***Infant between birth and 3 months***:
  Do a full septic work (CBC, blood cultures, chest x-ray urinalysis, urine culture, lumber puncture)

- ***3 months – 3 years:***
  Usually have identifiable causes and clinical assessment is more reliable. If fever without cause take decision based on clinical

appearance and temperature .If thre are respiratory symptoms request for chest x-ray

- ***Older than 3 years:***
  Source of fever usually identifiable. Laboratory evaluation is directed by the clinical findings.

Observation (follow-up)

Depend on the stability of the condition co-morbidity and underlying diagnosis.

Prevention:

Immunizations for children and adults

- Up to-date regular vaccinations
- Influenza vaccine
- Pneumoccocal vaccine
- Hepatitis vaccine
- Varicella vaccine

Teach patient about warning signs that need urgent medical care.
Teach family about home available treatments.
Teach family about importance of regular well baby clinic visits
Chemo-prophyxis for contacts exposed to patients: e.g. Tuberculosis, Malaria, Meningitis, Varicella.

Abdominal Pain

Definitions:

- It is the discomfort that is felt in the abdominal area. The area between the chest and the symphisis pubis.
- Acute abdominal pain: It is the pain which comes out and stays for few hours to a day.
- Chronic abdominal pain: Is the pain which lasts for weeks or more or repeated and comes frequently.

Epidemiology:

- In hospital emergency 35% of acute abdominal pain are due to non-specific abdominal cause
- About 17% is due to acute appendicitis and 15% due to intestinal obstruction.
- Abdominal pain is the fifth most common presenting complaint of adult medical patients.

The most common final diagnosis presenting as acute or chronic abdominal pain is the following in order of decreasing frequency.

Diagnosis	**%**
Non-specific	50.4
Acute gastroenteritis	9.2
Urinary tract infections	6.7
Irritable bowel syndrome	5.8
Pelvic inflammatory disease	3.8
Hiatus hernia or reflux	2.3
Diverticulosis	2.2
Tumour, benign	<2

Duodenal ulcer	<2
Urolithiasis	<2
Appendicitis	<2
Ulcerative colitis	<2
Muscular pain	<2
Others	9.5

Table 11. Causes of abdominal pain

Causes of Abdominal Pain

A. Gastrointestinal and interperitoneal causes

i. Inflammatory factors

Peritonitis: bacterial, chemical, perforated hollow viscus or ruptured ovarian cysts

Inflamed hollow viscus: appendicitis, gallbladder, peptic ulcer, colitis, diverticulitis, Meckel's diverticulitis

Solid organ: hepatitis, pancreatitis, abscess

Other: Lymphadenitis, pelvic abscess or infection, endometriosis

ii Obstruction: Intestinal or biliary

iii. Solid organ distension: acute hepatomegaly or splenomegaly

iv. Pelvic organ distension: ovarian cysts, fibroid uterus, ectopic pregnancy

v. intraperitoneal bleeding: ruptured liver, spleen, or hollow viscus; ruptured aortic, splenic or hepatic aneurysms; ruptured ectopic pregnancy; perforated ulcer.

vi. Ischemia: bowel, omental, splenic, or hepatic

vii. Trauma

B. Extraperitoneal causes

i. **Cardiopulmnary:** pneumonia, myocardial infarction, empyema,
ii. **Hematology**: leukemia, sickle cell disease,
iii. **Neurologic**: herpes zoster, spinal cord tumor, spinal osteomyelitis,
iv. **Urologic:** Urinary calculi, tumor, or infection,
v. **Genital**: Prostatitis, seminal vesiculitis, epididymitis,

C. Metabolic:
Uremia, porphyria, diabetes, addisonian crisis.
Drugs, toxins, heavy metals

D. Abdominal wall: trauma, hematoma, abscess

E. Fictitious and **psychogenic**

Interviewing

a. Aim:
- Establish rapport
- Find out the system affected
- Assess seriousness
- Find out surgical causes
- Guide physical examination
- Guide investigations
- Guide management modality

Socio-demographic characteristics:

Age:
- **Elderly** patients who come with abdominal pain must be treated with particular caution due to:
  - Difficult communication.
  - Inability to tolerate intra-vascular volume loss.
  - Unusual presentation of common diseases.
  - May not mount a WBC count or a fever.

- Complaint often commensurate with severity of disease.
- Up to 2% of elderly patients with a Myocardial Infarction (MI) present with abdominal pain.

- **Children**: Clinical feature of acute appendicitis is NOT typical and can rupture early.

Description of a pain (symptom analysis) through:

Onset: Abrupt onset (Red Flag)
Perforation
Acute vascular event
Volvulus
Strangulated hernia
Ovarian torsion
Pancreatitis

$(PQR)^2$ ST^3 "mnemonic"

P. Provoking factors
P. Palliating factors
Q. Quantity of pain
Q. Quality of pain
R. Region
R. Radiation
S. Severity of pain

T_3. Temporal issues
1. Onset of pain
2. Character of pain (constant or fluctuating)
3. Frequency

History

Pain – as described above $(PRQ)^2$ ST^3

Associated symptoms

- Fever
- Weight loss or gain
- Bowel habits "Diarrhea, constipation"
- Vomiting
- Malaise
- Anorexia
- Nausea
- Location of pain
- Generalized pain

Review of systems

- Cardiovascular
- Chest
- Skin
- Musculoskeletal
- Urogenital

Family history

- Similar complaint or problem

Past history

- Surgical
  - Previous surgery
  - Trauma
  - Appendicitis
  - Ectopic pregnancy

- **Similar complaints**

- **Medical history**
  - Cardiovascular
  - Ovarian
  - Peptic ulcer

Drug history

- Use of drugs for indigestion (antacids)
  - Non steroidal anti-inflammatory drugs (NSAIDs)
  - Steroids
- Drug Abuse
  - Addiction drugs
  - Alcohol

Lifestyle

- Diet – fatty foods, spicy foods, etc.
- Smoking
- Alcohol
- Hobbies

Psycho-social history

- **Ideas**:
  - Patients ideas and beliefs about reasons of abdominal pain
  - Concerns about:
    * Operations
    * Work – sick leave
    * Home, family issues

- **Expectations**
  - Reassurance about cause and prognosis
  - Investigations what, when to be done
  - Operations – Risks of undergoing surgery, prognosis
  - Referral – where
  - Pain relief – pain killers
  - Sick leave

- **Effect on patient, interference with patient's life**
  - Work, sick leave, deduction from salary
  - Home, family

- Hobbies
- Financial issues

- **Depression** – Check for the criteria

- **Anxiety**
  - Pain - operations
  - Anaesthesia

- **Stress**
  - Job
  - Financial losses
  - Social, caring for family, children, wife

- **Support system**
  - At home – wife, parents
  - At work, friends, colleagues
  - Social network

- **Hidden agenda**
  - Other problems such as addictions, alcohol
  - Financial loss
  - Malingering, social gains such as sick leave

Physical Examination

Aim:

- To determine seriousness of diagnosis
- To determine urgency
- To determine diagnosis

A. General:

Patient's appearance, ability to answer questions, position in bed and degree of discomport. Dehydration may be suggested by dry mucous membranes, sunken eyes, and by rapid and shallow respirations. A patient writhing on the bed or pacing the room may have kidney stones, while a patient lying still is more likely to

have peritoneal irritation. Facial expression may indicate pain of a crampy or constant nature. Pallor suggests anemia.

B. Vital signs:

Temperature, tachycardia and hypotension may signify hyopovolemia (red flag). A variant in blood pressure between the arms and legs may indicate aortic dissection. Increased respiration may signify metabolic acidosis, DKA, diaphragmatic irritation, or pain.

C. Inspection:

Scars, hernias, masses, distention, peristaltic waves, rash (herpes zoster), signs of liver disease (jaundice, spider angiomas, palmar erythema, ascites), pancreatitis (Grey Turner/'s sign – purple/red in flanks; Cullen/'s sign – red umbilical). Distention (red flag): Bowel obstruction

D. Auscultation:

Frequency and pitch of bowel sounds. High pitched bowel sounds may indicate obstruction. Presence or absence of abdominal bruits.

E. Percussion and palpation

1. Have patient point "with one finger" to an area of greatest pain
2. Begin in the quadrant free of pain and perform lightly (Note voluntary and involuntary guarding, rigidity and rebound). Study the face
3. Organomegaly, and other masses including the bladder, and hernias. Pulsatile mass (Abdominal Aortic Aneurysm).
4. Costovertebral angle tenderness

F. Genitourinary

1. Umbilical hernia (and inguinal hernia)
2. Examine the testicles for swelling and/or retraction
3. Penis for discharge

G. Pelvic examination

1. Both speculum and bimanual examination
2. Gonoccocal/Chlamydia cultures, Wet prep/Trichomoniasis evaluation if indicated
3. Cervical motion tenderness (Genito-urinary vs. peritonitis), adnexal tenderness, masses, discharge, bleeding or foreign bodies.

H. Degital Rectal examination(DRE)

1. Probe for perirectal mass, fecal impaction, prostate enlargement or irregularity
2. Guaiac stool
3. Rectal tenderness 40% in appendicitis but rarely confirms or excludes the diagnosis

I. Specific Signs

1. **Psoas sign:**
   Pain on passive extension of the right hip. Suggestive of appendicitis
2. **Obturtaor sign:**
   Pain with passive flexion and internal rotation of the right hip. Suggestive of appendicitis.
3. **Rovsing's sign:**
   Referred pain in the Right Lower Quadrant when palpating Left Lower Quadrant. Suggestive of appendicitis.
4. **Murphy's sign:**
   Inspiratory arrest with deep palpation of the Right Upper Quadrant. suggestive of cholecystitis.
5. **Carnett's sign**:
   Increased tenderness to palpation when abdominal muscles are contracted. Suggestive of abdominal wall pain.

Table 14. Clinical presentation of some causes of abdominal pain

Condition	Presentation	Evaluation
Peritonitis	Diffuse, severe tenderness; guarding or rigidity; absent bowel sounds; rebound	Diagnosis is clinical; upright chest film may show free intraperitoneal air
Appendicitis	Focal, lower right quadrant (McBurney/'s point) with rebound tenderness, anorexia	Diagnosis is clinical; ultrasound, CT scan, spiral CT scan or barium enema may help in diagnosis
Acute Pancreatitis	Diffuse upper abdominal tenderness radiating to the back; mild rebound; ileus; Grey Turner's sign (flank hematoma)	Serum amylase and Lipase; ultrasound or CT scan
Acute Cholecystitis	Right upper quadrant tenderness; muscle guarding; worse with inspiration	Ultrasound
Diverticulitis	Left lower quadrant tenderness; rebound; guarding; fever; quiet bowel sound	CT scan; barium enema (Gastrografin should be used if a perforation is a possibility)
Small bowel obstruction - Proximal	Nausea, vomiting; alkalosis; normal or quiet bowel sounds; NO distension	Abdominal film; upper GI series endoscopy

Small bowel obstruction - Distal	Nausea, vomiting; tenderness, distension; hyperactive bowel sounds	Ultrasound; ERCP; cholangiogram
Cholangitis	Fever, jaundice; right upper quadrant pain	Ultrasound; ERCP; cholangiogram
Ectopic pregnancy	Peritonitis, hypotension; anemia; shock	B-hCG; vaginal ultrasound
Ruptured Aortic Aneurysm	Upper abdominal tenderness; back pain; pulsatile mass; hypovolemic shock	Angiogram; ultrasound, CT scan

Management

Generally it depends on the cause but the following are general outline

1. **Explanation**
   - Nature of condition
   - Seriousness
   - Modality of treatment

2. **Reassure**
   - Patient may have or may not have a serious disease
   - If have a serious disease – approach approriately

3. **Advise**
   - Exercise
   - Balanced diet
     - Eat small, frequent meals
     - Eat balanced diet, high fiber, high vegetables and fruits
     - Limit foods that produce gas
     - Drink plenty of water

- Exercise regularly
- Quit smoking
- Lose weight
- Stop eating 2 hours before bed time
- Stay upright for 30 minutes after eating
- Elevate head of bed

4. Prescribe

- Antacids for heartburn
- Paracetamol for pain relief
- Antispasmodics
- Antibiotics for proven bacterial infections
- Specific treatment depends on the etiology

5. Referral

- Sudden, sharp abdominal pain
- Fever not responding to simple analgesics
- Have chest, neck, shoulder pain
- Vomiting blood or blood with stools
- Rigid, tender abdomen
- Unable to pass stools especially with vomiting
- Experienced weight loss
- Pain with pregnancy

6. Home care

- Sips of water or clean fluids
- Avoid solid food for first 24 hours
- Avoid citrus fluid, high fatty foods, greasy food, tomato products, caffeine, alcohol or carbonated water

7. Investigations (According to your differential diagnosis)

Cholelithiasis:

Transabdominal ultrasound
CT scan
Oral cholecystogram

Acute calculous cholecystitis:
Cholescintigram
Transabdominal ultrasound

Choledocholithiasis:
Transabdominal ultrasound
ERCP
MRI
Endoscopic ultrasound
Helical CT scan

Acute pancreatitis:
Contrast CT scan
Transabdominal ultrasound
Serum lipase
Serum amylase

Chronic pancreatitis:
ERCP
Plain abdominal radiograph
CT scan
Transabdominal ultrasound

Pancreatic cancer:
ERCP
CT scan
Transabdominal ultrasound

Bowel obstruction:
Plain abdominal radiograph
Transabdominal ultrasound
CT scan

Appendicitis:
(Usually clinical diagnosis)
Elevated WBC
Elevated CRP
Transabdominal ultrasound

Transabdominal ultrasound with inconclusive clinical picture
CT scan with rectal contrast (for "definitely" or "probably" appendicitis)
Transabdominal ultrasound followed by CT scan with rectal contrast (if needed) in children

Dyspepsia

Definition:

It is a group of symptoms of upper abdominal discomfort retrosternal pain, anorexia, nausea, vomiting, bloating, fullness and heartburn.

Prevalence:

Surveys carried out in western countries reported the prevalence between 23-41%. Only 25% of dyspeptic populations visit their own doctors. About 4% of G.P. Consultations are for dyspepsia and 2% of the entire population receive either endoscopy or barium meal each year. Time lost from work and overall quality of life is considerably affected. Only 10% of the patients with dyspepsia are referred to hospital. Research indicatea that prescribing for dyspepsia is now the largest single area of cost of Primary Care, 500 millions pounds per year in UK in 1996.

Differential Diagnosis

Common causes of dyspepsia:

Table 15. Differential diagnosis of dyspepsia

Diagnosis	% of Patients
Functional dyspepsia	50 – 70
Esophagitis	0 – 18
Peptic ulcer disease	5 – 21
Doudenal	2 – 13
Gastric	2 – 8
Gastric cancer	1 - 3

Risk factors:

- Obesity

- Smoking
- Anxiety, depression
- Fatty meals
- Junky foods

Interviewing:

Aim:

- To establish rapport with the patient
- To find out risk factors
- To find out possible cause

Complaint:

Epigastric pain

Provoked by	Going to bed (supine or prone position)
Palliated by	Getting-up, antacids
Quality	Sharp, burning
Quantity	Severe
Region	Upper abdomen, mid chest
Radiation	Shoulders, jaw
Severity	Morning
Temporal factors	Gradual or sudden
	Constant last for 30 – 120 min
	Recurrent over months

Past medical history:

- Surgeries
- Allergies
- Hospitalization
- Medications (antacids), Antidepresants

Family and social history:

- Family structure
- Heart, diabetes, hypertension, psychiatric problems

Review of systems:

- Cardiovascular, respiratory, gastrointestinal, genito-urinary, psychiatry

Drugs use:

- Antacid, NSAIDS, Antidepressants

Lifestyle:

- Diet (fatty, big meals)
- Smoking
- Alcohol use
- Exercise

Psychosocial:

- **Ideas**
  Ideas and beliefs of the patient towards his illness
- **Concern**:
  Patient might think that this complaint is due to cancer, ulcer or other serious disease, he might also feel concern that he could not work because of this problem.
- **Expectations:**
  Patient may expect any of the following:
  - Reassurance
  - Investigation, endoscopy – Barium meal
  - Referral
  - Sick leave
- **Effect on life:**
  You need to explore the effect of this problem on his family, work, etc.
- **Depression, anxiety and stress:**
  Screen your patient for depression, anxiety and stress and go in details when needed
- **Support system:**
  Check for sources of support at home, work, friend, community
- **Hidden agenda:**
  Patient might have a different problem, other than his main complaint e.g.

- Financial problems
- Worry that he has a malignancy
- Other problems

Physical Examination

Aim:

- To find out system affected
- To find out organ affected
- To rule out serious illness
- To guide investigations

Vital signs:

Weight, Height, Blood Pressure, Pulse, Respiratory rate, Temperature

Systems:

- Respiratory system
- Heart sound, pulses
- Abdomen - look for:
  Loud sound
  Abdomen convex, palpable masses, tenderness
  Guarding
  Liver, spleen (tenderness, organomegally)
  Tender upper abdomen
  Murphy's sign
  Hernias

Management

- **Explanation:**
  Explain: Nature of the problem
  What is ulcer and non-ulcer dyspepsia
  Prognosis: Ulcer dyspepsia can be treated effectively while non-ulcer dyspepsia (functional) should be regarded as recurrent condition as the cause is unclear.

- **Reassurance:**

General reassurance may be important.

- **Advice:**
  Stop smoking
  Lifestyle advice, healthy eating, exercise, weight loss

Table 16. Characteristics of diagnostic tests useful in patients with dyspepsia

Disease	**Test**	**Sensitivity**	**Specificity**
Gastro-esophagealreflux disease	Omeprazole test Endoscopy 24-hrs pH monitoring	0.78 0.22 0.80	0.85 0.74 0.73
Peptic ulcer disease	Endocopy	0.92	0.99
Gastric ulcer	Endoscopy	0.85	0.98
Duodenal ulcer	Endoscopy	0.99	1.00
Helicobacter pylori infection	Urea breath test Stool antigen test Serum IgG antibody tests Whole-blood antibody tests	0.91-1.0 0.94 0.86-0.96 0.76-0.9	0.96-1.0 0.92 0.75-0.89 0.79-0.98

- **Referral:** For endoscopy or alarm symptoms

- **Observation:** To check for a change of symptoms or alarm symptoms

- **Prevention:** Healthy life style and eating habits
  Psychological states (screen for depression)
  Stop smoking
  Regular exercise

NSAIDs drugs rationalization

Table 17. Drug Therapy for Dyspepsia

Indication	**Drug**	**Dosage**	**Caustions/ Adverse Effects**
Gastroesophageal reflux disease	H2RA or PPI	Normal-dose H2RA or PPI (for refractory symptoms, may double dose) Duration: 2-4 wks	Adverse effects rate comparable to that of placebo
Helicobacter pylori eradication	Regimen A: PPI or ranitidine-bismuth and clarthithromycin and amoxicillin or metronidazole	High-dose PI 2 tablets two times daily 500 mg twice daily 1,000 mg twice daily 500 mg twice daily Duration = 2 wks	50% of patients have mild side effects, 5% discontinue because of adverse effects, o.1%-0.5% develop pseudomembranous colitis
	Regimen B: bismuth subsalicylate and metronidazole and tetracycline and H2RA or PPI	Two tablets four time daily 250 mg four times daily 500 mg four times daily High-dose PPI or normal-dose H2RA Duration = 2 wks	Adverse effect more common with bismuth-containing regimens

Peptic ulcer disease (Helicobacter pylori-negative)	H2RA or PPI	For duodenal ulcers: Normal-dose H2RA or PPI; for gastric ulcers: normal-dose H2RA or twice normal dose or PPI Duration = 4-8 wks	
Functional dyspepsia	H2RA or PPI	Normal-dose H2RA or PPI Duration = 4 wks	

Note: Normal dosing for H_2RAs: cimetidine, 400 mg daily; famotidine, 20 mg twice dialy; nizatidine, 150 mg twice daily; ranitidine, 150 mg twice daily. Normal dosing for PPIs: lanzoprazole, 15 mg daily; omeprazole, 20 mg daily. High dosing for PPIs: lansoprazole, 30 mg twice daily; omeprazole, 20 mg twice daily.
Abbreviation: H_2RA, histamine-2 receptor antagonist; PPI, proton pump inhibitor.

Change in Bowel Habit

Definition:

The frequency of bowel action in a group of individuals follows normal distribution. There is no sharp demarcation between normal and abnormal bowel habit. In most of the individuals the range falls between 3 motions everyday to 3 motions every week. It is very important to note the change in bowel habits from the patient's view especially in the elderly as this may arise the suspicion of a large bowel tumor.
In normal children: frequency can vary from several bowel movements per day to one bowel movement every few days .

Diarrhea

Definition: Increase stool frequency and liquidity. It can be defined as the passage of more than three loose stool a day.

Differential Diagnosis

A. Acute (Infective or toxic diarrhea)

- Sudden onset
- Fever, epigastric, periumblical pain, anorexia, vomiting are suggestive of small intestinal infection
- In infants – (viral gastroenteritis usually due to Rota virus) is a serious illness due to possible dehydration.

B. Chronic

1. Increased secretion

- Clostridium toxin
- Cholera toxin
- Non-invasive microbial gastroenteritis (e.g. viral gastroenteritis, campylobacter)
- Carcinoid syndrome
- Vasoactive intestinal peptide secreting tumors
- Villous adenoma

2. **Increased osmotic load**
   - Sorbitol ingestion (dietetic candy)
   - Bile salt malabsorption
   - Pancreatic insufficiency
   - Lactose intolerance
   - Malabsorption
   - Post-gastrectomy syndrome
   - Magnesium containing laxatives

3. **Inflammation**
   - Ulcerative colitis
   - Crohn's disease
   - Radiation induced colitis
   - Invasive microbial gastroenteritis (e.g. shigella)

4. **Altered motility**
   - Thyrotoxicosis
   - Irritable bowel syndrome
   - Autonomic neuropathy (e.g. diabetic associated enteropathy)

Table 18. Common bacterial and protozoal causes of acute diarrhea

Bacteria	**Food source**	**Symptoms**	**Incubation period**
Salmonella spp.	Eggs, poultry, beef, milk, salads	Slimy "pea soup" stools, fever	6 – 24 hrs.
Campylobacter spp.	Poultry, milk	Bloody diarrhea, abdominal pain, fever, generalized malaise, coryza, headache	48 – 72 hrs.

Clostridium perfringens	Poultry, beef	Watery diarrhea, abdominal pain	8-24 hrs.
Staphylococcus aureus	Poultry, salads	Diarrhoea, vomiting	2 – 6 hrs.
Shigella spp.	Salads	Watery diarrhoea initially becoming bloody later, fever	36 – 48 hrs.
Bacillus cereus	Fried rice	Diarrhoea, abdominal pain, vomiting	1 – 6 hrs.
Giardia lamblia	Water, person to person contact, homosexual contact	Diarrhoea, steatorrhoea, Very bad smell	7 – 14 days

Constipation

Definition: Straining at passing stools for more than25% of bowel movements.

Importance:

1. Vital to diagnose early to exclude intestinal obstruction whenever there is:
   - Complete constipation
   - Vomiting
   - Pain
   - Visible peristalsis
   - Progressive abdominal distension

Causes of constipation:

1. **Anorectal disorders** Anal fissure; anal stenosis; anterior mucosal prolapse; descending perineum syndrome; haemorrhoids; perianal abscess; rectocele, tumours.

2. **Colonic disorders** Irritable bowel syndrome; diverticular disease; tumours; strictures: carcinoma, Chrohn's disease, diverticulitis, ulcerative colitis, ischaemic colitis, tuberculosis, amoebiasis, syphilis, lymphogranuloma venereum, endometriosis; hernias; volvulus; intussusception; ulcerative colitis with right sided faecal stasis; pneumatosis cystoids intestinalis; idiopathic slow transit constipation.

3. **Pelvic causes** Pregnancy and the puerperium; ovarian and uterine tumours; endometriosis.

5. **Neuro-muscular causes**
   Peripheral: Hirschsprung's disease, autonomic neuropathy, Chagas' disease, intestinal pseudo-obstruction;
   central: cerebrovascular accident, cerebral tumours, Parkinson's disease, meningocele, multiple sclerosis, tabes dorsalis, paraplegia cauda equina tumour, trauma to lumbosacral cord or cauda equina; ***muscular:*** dermatomyositis, dystrophia myotonica, progressive systemic sclerosis.

6. **Psychiatric disorder** Depression; anorexia nervosa; denied bowel action.

7. **Endocrine** Diabetes mellitus; hypercalcaemia; hypothyroidism; hypopituitrism; phaeochromocytoma.

8. **Metabolic** Hypokalaemia; lead poisoning; porphyria; uraemia.

9. **Environmental** Debility; dehydration; immobilization

10. Drug induced Anaesthetics; analgesics; antacids (containing aluminium and calcium); anticholinergics; anticonvulsants; antidepressives; antihypertensives; antiparkinsonian drugs; diuretics; ganglion blocking drugs; iron; laxatives (habitual abuse); monoamine oxidase inhibitors; oral contraceptives; psychotherapeutic agents.

Interviewing

The following special points are important:

- What is your normal bowel habit and when this was changed?
- Number of motions per day.
- Recent stress
- Tropical travel
- Time of day when diarrhea is worst
- Close contact to a patient with diarrhea
- Stool volume
- Description of faeces, stratorrhea
- Blood, mucus in stool
- Associated pain and its site
- Associated fever
- Arthritis or eye problems

Physical Examination

Aim:

- To find out a cause for either diarrhea or constipation
- To establish and foster Dr./patient relationship

Check particularly for:

- Anaemia or icterus
- Dehydration
- Recent weight loss
- Signs of nutritional deficiency
- Fever – clubbing
- Rash, spots for typhoid
- Distension of abdomen

- Abdominal mass
- Organomegally
- Abdominal tenderness
- Bowel sound
- Rectal examination

Investigations:

- CBC
- ESR
- Electrolytes
- Urea, creatinine
- Blood sugar
- TSH
- Liver function tests
- If diarrhea – microscopy and culture of stool
- X-ray, abdomen
- Biopsy – rectal mocosa
- Barium enema
- GI endoscopy
- Ultrasound

Management

Clarification:

- Normal habit, change of habit
- Nature of diarrhea or constipation
- Prevalence
- Prognosis – in infants, middle aged, elderly (depends upon the diagnosis)

Reassurance:

- Nature of the problem. Most probably it is a benign condition.

Advice:

- Food, fluids
- Educate about self management of diarrhea and constipation (food, natural remedy fluids, etc..)
- Mobility for constipation

Prescribing:

A. diarrhea:

- Simple fluids (ORS)
- Anti-diarrhea agents are not recommended
- Antibiotics are not recommended unless specific infections
- Indications for antibiotic treatment:
  1. Severe cases of infection with *Shigela* spp. And *Campylobacter jejuni*. For *Shigella* spp. Other than *S. sonnei* give ciprofloxacin in adults and ampicillin in children. For *C. jejuni* give erythromycin in severe cases.

  2. Immunosuppressed patients, babies, and very old people infected with *Salmonella* spp. – give ampicillin, trimethoprim, or ciprofloxacin.

  3. Severe cases of infection with *Clostridium difficile* give vancomycin or metronidazole.

  5. Giardiasis – give metronidazole 2 g for three days

B. constipation:

- Simple advice, high fibre diet, milk before bed, exercise, etc.
- Anti constipation agents:
  1. Bulk agents e.g. Methylcellulose 1-4 tablespoon daily
  2. Lubricants e.g. minral oil 1-4 tablespoon
  3. Osmotic e.g. Sorbitol, lactulose, glycerin
  4. Others: Such as stimulants or irritants (such as sinna, bisacodyle (Dulcolax)
     a Enemas
     b Saline laxative

Referral:

- Suspected intestinal obstruction
- Suspected T.B.

Investigation: According to your working diagnosis

Prevention:

- Exercise
- Avoid fatty foods
- Eat fibre rich foods
- Increase fluids in case of diarrhea

Painful Joints

Definitions:

Joint pain: A feeling of distress, suffering and discomfort caused by stimulation of specialized nerve ending in one or more joints regardless of physical findings.

Acute paiful joint: duration less than 8 weeks.

Chronic: more than 8 weeks.

Mooarthritis: involve only one joint.

Pauciarthritis: involve 2 to 5 joints.

Polyarthritis: involve more than 5 joints.

Epidemiology:

Around 10% of family practice visits in USA are due to joint problems forming the 14th commonest cause for visit.

Risk Factors:

A lot of factors are believed to interact to cause varying degrees of articular disease in individual patients. These include:

- **Aging:** Due to separation of the collagen network.
- **Genetic factors:** rheumatological diseases.
- **Obesity*:*** increase loading distress
  - **Neuropathy:** Abnormal muscle tone may result in osteoarthritis by transferring abnormal forces to the joints.
  - **Deposition disease**s: (e.g.: hemochromatosis, Wilson's disease, gout, etc…). These cause deposition of substances in the cartilage matrix which can disturb loading forces.
- **Infections:** e.g. Brucellosis, gonorrhea, influenza, rubella.

- **Trauma:**
- **Hypermobility syndromes.**
- **Psychological problems** e.g. school phobia.

Differential diagnosis

A. Mono-articular

- **Infections:** e.g. Gonorrhea, Brucellosis
- **Crystal induced arthropathies**: e.g. (Gout or pseudo-gout)
- **Trauma**
- **Solitary joint involvement of poly-articular disease** e.g. single joint involvement in rheumatoid arthritis, osteoarthritis, psoriatic arthritis
- **Rieter's syndrome**
- **Ankylosing spondylitis**
- **Viral synovitis**

B. Poly articular

- **Osteoarthritis**
- **Sickle cell disease**
- **Rheumatoid arthritis**
- **Systemic lupus erythromatosus (SLE)**
- **Gonococcemia**
- **Viremia**
- **Psoriatic arthritis**
- **Subacute bacterial endocarditis (SBE)**
- **Scleroderma**

Interviewing

Aim:

1. To role out serious diagnosis.
2. To establish a good rapport with patient
3. To guide management plan.

Socio-demographic Data:

Age:	Young	tumor is more common
	Old	Osteoarthritis is more prevalent.
Sex:	Female:	Rheumatologic diseases are more common among females.
Occupation:		Over use of the joint can cause osteoarthritis

Chief complaint:

Pain:

Duration*:*

Short might indicate Infection or Trauma

Long: might indicate osteoarthritis, rheumatoid arthritis, connective tissue disease or fibromyalagia

Variation:

Nocturnal*:* occurs more in tumor

Aggravating factor:

- Increase with use indicates osteoarthritis. Or endonitis
- Pain only with movement in certain direction indicates non- articular pain
- Pain that in all direction indicates that the couse is arthritic.

Location:	Mono-articular. Poly-articular Symmetrical: R .arthritis
Pattern:	Migratory: Rheumatic fever Gonococcemia Reiter's syndrome
Stiffness:	Morning stiffness more than 45 minutes might indicate inflammatory arthritis

Joint function: normal indicates that it is non-articular pain.

Symptoms of inflammation: - Swelling
- Redness
- Warmness
- Tenderness

Fever: - Infection
- Connective tissue disease
- Tumor

Weight loss: - Infection
- Tumor

Risk factors Raw milk ingestion; infection (brucellosis)
Trauma
Sexual history (Sexually transmitted Infection)

System involved: Back pain, joint pain, swollen joints, warm joints, joint deformities, muscle weakness, history of gout, osteoarthritis or rheumatoid arthritis.

Complications (Impact)

Effect on daily activity: e.g. Absence from work
Deformity

Past medical history:

Surgical: Previous surgery in a specific joint
Trauma, accident
Medical: History of infection e.g. Brucellosis
Hematological disease
Rheumatological disease
Diabetes Mellitus

Family history:

Similar problem in the family
Rheumatological disease in the family

Drugs history

Prescribed drug:
Pyrazinamide, isoniazid: can cause a lupus- like syndrome. you need to specify; name, cost, side- effects, compliance, dose of each drug.

Over the counter (drug side effects)
epigastric pain.
constipation,
others

Abused drug: I.V. drug: can couse infection like hepatitis or HIV
Steroid: mmunocompromized

Lifestyle:

Exercise: type, frequency
Hobbies: contact with animals: Brucellosis
Smoking: if positive take detailed history (see Smoking cessation)
Alcohol use or abuse

Psychosocial:

Idea: What are the patient beliefs about his problem; he might think he has black magic

Concern*:* Patient may think it is a serious problem: e.g. SLE
He may think this will make him unable to do his regular work

Expectations:

Reassure the patient that there is no serious problem
Patient might expect prescribing physiotherapy
He may expect investigation e.g. MRI
He may want intra-articular injections
He may ask for a referral to a well known orthopedician
He may expect a sick leave

Effect: Explore How does the joint pain affect patient negatively on his/her life

Work: e.g. he is a soldier and can not do his job properly.
Home: Impact of the patient's problem on his family member; he can not perform his daily home work.

Socially: He can not participate in social activity or cannot practise his usual hobbies.

Depression*:* Check depression criteria starting with quick screen for his/her mood and interest in social occasions.

Anxiety*:* Check anxiety criteria. e.g. unexplained worry, etc.

Stress: Check for source of stress in patient's life e.g. A pressure from his peers at the work place
Financial problems exaggerated by current problem or presence of social stressors

Support system:

At home: the patient's wife/husband, relatives, housemaid relationships.

Work: help from colleagues, special organizations.. Friend help and support
Community: Agencies that can help him, medically or financially.

Hidden agenda: Try to explore if the patient has any hidden agenda e.g. he has other problems with stigma e.g. sexual problems or he wants to get something e.g. financial, sick leave, etc.

Physical Examination

Aim:

- To rule out serious/urgent diagnosis
- To determine a specific diagnosis
- To determine patient's activity
- To determine patient's comfort
- To maintain rapport with patient

General observation of the patient Well or ill looking
Gait (describe)

Vital signs High Temperature:
infection
Rheumatological disease
Pulse
Blood pressure

Weight and height: (Body Mass Index): Obesity

Skin:

Malar rash or mouth ulcers (SLE).
Nail pitting: ? psoriatic arthritis
Papillovesicular pustular lesions (gonococcemia)
Tophi (gout)
Heliotropic eyelid rash: (Dermatomyositis, SLE)
Rheumatoid nodule: (Rheumatoid arthritis)
Finger tip atrophy or ulcers, calcinosis and telangiectasia (scleroderma)
Hyperkeratotic lesions on the palms and soles (keratoderma blenorrhagia), blanitis circinate painless ulcer on the penis: (Reiter's syndrome).

Head: Hair loss, scar: SLE, Drug side effects

Eyes: Conjunctivitis, uveitis: (Inflammatory bowel disease,drug side effects)

Respiratory system:
effusion, pleuritis (Rheumatoid arthritis, SLE)

Cardiovascular system: Pericarditis

Abdomen:
Spleenomegaly: Rheumatoid arthritis, SLE

Joint:

Signs of inflammation:
- Swelling
- Redness
- Warmth
- Tenderness

Range of Motion

Range of Deformity

Irregular bony enlargements
- Osteoarthritis
- Bouchard's node
- Heberden's node

Bony mass: (Tumor)

Periarticular tissues:
- Tendonitis
- Bursitis
- Myositis

Management

Clarification: Depends on the underlying diagnosis. However it should include:
- Nature of the problem
- Magnitude of the problem in Thecommunity
- Prognosis

Reassurance: Benign diagnosis: reassurance about the nature

Serious diagnosis: reassure the patient that he will be given appropriate care.

Advice:

RICE: most of the common injuries are treated with the RICE recommendations

- Rest
- Ice
- Compression
- Elevation

Protection: Splinting

Physical therapy*:*

Usually useful regardless of the diagnosis

Prescribing -

- Septic arthritis: Antibiotics
- Osteoarthritis: Paracetamol (1st choice)
- Rheumatoid arthritis: Non-steroidal anti inflammatory (NSAIDs)
- Disease modifying drugs:
  - Methotrexate
  - Sulfasalazine
  - Hydroxychloroquine
  - Gold
  - Penicillamine
  - Azathioprine
  - Corticosteroids
- SLE:
  - NSAIDs
  - Corticosteroids
  - Antimalarials
  - Azathioprine
- Gout
  - NSAIDs
  - Cholchicine
  - Allopurinol
  - Probencid

Referral:

- Rheumatologist: if patient need disease modifying drugs
- Orthopedic: If there is a need for joint drainage
- Ophthalmologist: basic fundus examination and follow up check for any complications. e.g. retinopathy in patient on hydroxychloroquine.
- Nephrologist: e.g. protinuria and glomerular toxicity in patient on gold therapy

Investigations

Arthrocentesis:

1. Appearance
   - Cloudy – infection
   - Bloody – Trauma
2. Leucocyte count:
   < 2000/cu mm, Non-inflammatory e.g. osteoarthritis
   2000-50,000/cu mm,Mild inflammatory e.g. arthritis, gout
   50,000-100,000/cu mm Severe inflammatory e.g. sepsis, gout
   > 100,000/cu mm, Sepsis
3. Gram stain
4. Culture
5. Glucose
6. Crystals

X-ray:

*Normal (*Early arthritis)

Osteoarthritis

- Joint space narrowing
- Change in subchondral bone
- Osteophyte

Bony erosions

- Rheumatoid arthritis
- Septic arthritis
- Gout

Prearticular osteopenia: Inflammatory disease

MRI: Periarticular soft tissue injury
ESR: Non-specific (increases in infections, infarction, malignancies, collagen vascular diseases, and physiologic stress)

Leukocytosis*:* Septic arthritis

Rheumatic factor (RF): Positive in 75% of patient with Rheumatoid arthritis.It can be found in vasculitis. it is IgM antibody directed against the Fc protein of IgG.

Antinuclear antibodies (ANA):
SLE: Sensitive, Non-specific
Rheumatoid arthritis
Scleroderma
Polymyositis
Dermatomyositis.

Duble-stranded DNA (dsDNA*):*
Specific for SLE (found in 70% of SLE patients)

Anti-Smith antibody:
Specific for SLE (found in only 30% of SLE patients)

Complement levels: Drop when thre is decreased production in the liver or increased loss – either through the formation of immune complexes or from glomular diseases.It can help in
1. liver diseases(viral hepatitis)
2. SLE nephritis
3. Glomerulonephritis
4. Rheumatoid arthritis with vasculitis

Chemistry: (Renal function)

(Uric acid)

Urinalysis: (Glomerular problems)
(Connective tissue disease)

Follow-up: According to the conditions

Prevention:

- Prevent further damage by splinting
- Regular screening for complication of condition and drug
- Regular follow-up with ophthalmologist to screen for side effects of drug.
- Regular essential investigation to screen for the effect of drug on kidneys.

Low Back Pain (LBP)

Definitions:

Low Back Pain (LBP): It is a sharp or aching sensation between the lower rib cage and the gluteal folds with or without pain or neuromotor deficits in the distribution of lumbosacral (LS) nerve roots.

Acute: new episode of low back pain less than 6 weeks duration.

Chronic: Back pain of more than 3 months duration.

Prevalence and burden of illness:

- One of the most common reason for family physician visits (2^{nd} to upper respiratory tract infections) accounts for 4% of visits.
- Fifth of all physicians visit.
- It is the most common disability for persons under the age of 45 years.
- Affect around 90% of people at sometime during their life.
- Around 90% of radiculopathy due to disk herniation is at the level L4 – 5 or L5 – S_1 lead to L5-S_1 roots dysfunction
- Annual prevalence is 50% for American population, only 15% seek medical advice.
- Direct and indirect cost per year is $24 and $50 billion respectively per year in the USA.
- Ninety percent back to normal within 4 weeks of duration.
- Two percent represent serious causes.
- No definite diagnosis in 85% of low back pain

Risk Factors:

- Obesity
- Smoking
- Psycho-social problem

  - Depression
  - Anxiety
  - Occupational stress
- Repetitive lifting
- Exposure to mechanical vibrations
- Prolonged sitting
- Sedentary lifestyle
- Age period of < 10 year, > 55 years
- Taking steroid
- HIV infection.

Differential Diagnosis

1. **Life-threatening:**
   - Cauda equina syndrome
   - Unstable fracture

2. **Serious (not life threatening):**
   - Tumor
     - Metastasis
     - Primary
   - Infection
     - Brucellosis
     - Tuberculosis
     - Osteomyelitis
     - Diskitis
     - Epidural abscess
   - Stable fracture
     - Minor trauma
     - Compression fracture
   - Visceral pain (referred)
     - Vascular
     - Genitourinary
     - Gastrointestinal
   - Inflammatory
     - Ankylosing spondylitis
     - Reiter's syndrome
     - Inflammatory bowel disease

3. **Mechanical (90%):**
    - Back strain
    - Lumber disk disease
    - Sciatica (L5 or S1)
    - Osteoarthritis
    - Spinal stenosis
    - Spondylosis (with or without spondylolisthesis)

4. **Psychosocial:**
    - Depression
    - Anxiety
    - Stress

Interviewing

Aim:

1. To rule out serious conditions
2. To establish rapport
3. Symptoms description
4. To explore psycho-social issues
5. To guide management

Socio-demographic: Patient's name, age, occupation.
Chief complaint:

- ***Pain***
    - Duration
    - Intensity
    - Quality
    - Location
    - Pattern
    - Aggravating factors
    - Relieving factors

History of presenting illness:

- ***Neurological deficit***
    - Numbness
    - Paresthesia
    - Bowel dysfunction

- Bladder dysfunction
- Sexual dysfunction
- Pseudoclaudication

- ***Associated symptoms***
  - Fever
  - Weight loss
  - Night sweat
- ***Risk factors***
  - Raw milk ingestion
  - History of TB
  - Long steroid use
  - I.V. drugs
  - Trauma
- ***Systems involved*** (Musculoskeletal)
- ***Complications***(impact)
  - Sit, stand, walk
  - Lifting weight
  - The effect on daily activity

Past medical history:

- ***Surgical:*** - previous surgery
  - previous trauma
- ***Medical*** - history of TB
  - history of brucellosis
  - back problems

Family history:

- Similar problems
- Rheumatologic diseases

Drug History: Side effects of traditional drugs available over the counter.

- ***Use***: - ***Alternative therapy***; Describe.
  - ***Prescribed:*** - Name
    - Cost
    - Side effects
    - Compliance
    - Dose

- ***Abuse:*** - Steroid
  - I.V. drug abuse
  - Other

Lifestyle: - Diet
- Exercise
- Hobbies
- Smoking
- Alcohol

Psychosocial:

Idea: - Patient beliefs: patient might think he/she has a disk prolapse

Concern: patient might worry to have any of the following:
- Serious disease
- Make him disabled
- Firing from work e.g. military

Expectations*:* Patient might expect any of the following by the end of the consultation:
- Reassurance
- Physiotherapy
- Investigation e.g. MRI
- Referral
- Sick leave
- Narcotics

Effect: Low back pain can affect your patient in different ways e.g:
- interfere with patient's life
- affect his productivity in his work
- Home: cannot do his homework
- Socially: by affecting his relationship and participation in social activities

Depression: (Check depression criteria)
Anxiety*:* (Check anxiety criteria)
Stress: Check for stress sources at:
- Job
- Financial
- Social

Support system:
- At home
- At work
- Friends
- Community (agencies)

Hidden agenda:
- Other problems with stigma
- Achieving financial gain
- Worry that patient might have malignancy

Physical Examination

Aim:
1. To determine diagnosis
2. To determine patient's activity
3. To determine patient's comfort

General:
1. General observation of the patient
   - Describe the gait
   - Look for Evidence of severe neurological deficit
2. Vital signs
3. Weight and height and calculate body mass index (BMI)

The back:

Inspection
- Signs of infection or trauma
- Unusual skin markings
- Posture
- Midline asymmetry
- Posture: tilt to one side
  - Muscle weakness
  - Para-vertebral muscle spasm

Palpation

- Bone
  - Spinous processes
  - Sacro- iliac Joints
- Soft tissues
  - Intraspinous ligaments
  - Defects
  - Tenderness
  - Para-spinal muscles
    - Tenderness
    - Spasm
    - Defects
    - Sciatic nerve (palpable with flexed hip)

Range of movement (look for movement restriction and exacerbation of pain)

- Flexion
- Extension
- Lateral bending- of pain
- Rotation

Neurological Testing

Aim:

- To seek for evidence of nerve root compression
- To seek for peripheral neuropathy
- To seek for spinal cord dysfunction

Selected special tests:

1. ***Straight leg raising test:***

- Test for tension of the sciatic nerve
- Ask patient lie on his/her back
- Ask patient raise his/her leg (passively) until 70 degrees or when feel pain below back of the knee
- This pain is aggravated by dorsiflexion of the ankle and relieved by ankle plantar flexion.

2. ***Crossed straight leg raising test:***
   Straight raising of well leg produces pain in the leg with sciatica (more sensitive and less specific of compression at disk level)

3. ***Setting knee – extension test***
   Patient sitting on the examination bed with his/her knees bend over the end of the bed.

4. ***Extend the patient knee (passive)***
   Pain feels below the knee (+ve)

5. ***Circumferential Measurements:***
   Measure both thigh and both calfs. If difference between right and left ≥ 2 cm. This mean: muscle atrophy (chronic)

Neurological Screening

Sensory: Light touch and pressure in the foot is enough:

- **Medial:** **L4**
- **Dorsal:** **L5**
- **Lateral:** **S_1**

Reflexes:
- **Knee Jerk:** **L4**
- **Ankle Jerk:** **S_1**

Squatting and rising: **L4**

Heel walking: **L5**
Toe walking: **S_1**
Ankle evertors: **L5 – S_1**
Big toe dorsi flexor: **L5**
Toe flexor: **S_1**
Sphincter tone **S_1**

Evaluation of extraspinal causes:

- Abdomen
  - Pulsatile masses
  - Bruits

- Vascular - diminished pulse
  - ↓ temperature
  - Change color
- Pelvic examination (When indicated)
- Rectal examination (when indicated)

Waddell signs (No organic physical sign)

When history and physical examination findings are inconsistent with patient's behavior (verbal and non-verbal communication) e.g. Over-reaction vertical loading on standing patient's skull, produces low back pain (in reality it should not)

This maneuver can be used in the following situations:

- Patient uses LBP as a ticket of entry to health care system
- Habits
- Psychosocial reasons
- Draw attention
- Malingering

You should be positive: Try to identify reasons for this behavior. As interpretion of pain behavior as malingering neither benefits the patient nor the clinician

Management

Clarification (education):

- *Nature*: of the problem (consider the stage of disease e.g. - Sciatica takes longer time to recover
- *Prognosis*: 90% of patients improve within 4 weeks with conservative treatment.
- *Prevalence*: it is a common health problem (see epidemiology).

Reassure - That the patient has no serious condition.
- Patient will receive the best available health services.

Advise:

- Exercise as tolerated
- Avoid weight lifting
- Show him how to lift items (put weight on the knees rather than the back).
- Educate him about:
  - Reaching
  - Bending
  - Twisting motions
- Avoid prolonged sitting
- Bed rest: not helpful and could be harmful (if > 4 days) by deconditioning the muscle and can lead to a chronic pain.
- You can give specific instructions about activity at work (when requested).

Prescribing

A. Pharmacological methods:

a. Recommended:

1. Paracetamol: Safest 1000 mg PO, QID
2. NSAIDs: e.g. Ibuprofen 600 – 800 mg TID with foo; side effects are GI irritation/ulcer and renal problem

b. Optional:

1. *Muscle relaxan*: Not more effective than NSAIDs, may help if there is a significant spasm (no evidence)
   - S/E: Drowsiness (30%)
2. *Opioids* (short course)
   Not more effective than paracetamol or NSAIDs
   They should be avoided as possible .Misuse reported in 35% of patients (warn your patient)

c. Prohibited:

1. Opioids > 2 weeks
2. Steroids
3. Cholchicine
4. Antidepressants

B. Physical Therapy

a. Recommended:

1. Manipulaiton*:* - Safe, effective in the 1st month if no radiculopathy. If no effect in 4 weeks it should be *stopped*.
2. Ice and heat
3. Exercise: - Improve patient's satisfaction and modify the symptoms e.g. low-stress aerobic exercises.

b. No proven benefit:

1. Traction
2. Invasive technique e.g. Needle acupuncture and injection procedure
3. Corset (braces)

Referral:

To neurosurgeon or orthopedician in thefolowing situations:

1. Cauda equina syndrome
2. Cord compression
3. Persistent symptoms
4. Intractable pain

Investigations

- Not recommended in the 1st month except:
  1. Red flag symptoms or signs
  2. Non-spinal conditions

- CBC, ESR, urine analysis: When indicated

- Plain x-ray indications in the follwing cases:
  1. Significant trauma
  2. Neurological deficit
  3. Systemic symptoms
  4. Temperature: > 38°C
  5. Weight loss

6. Medical history of:
   - Cancer
   - Steroids
   - Drug abuse
7. Ankylosing spondylitis
8. Compensation

- CT & MRI indications
  1. Cauda equina syndrome
  2. Tumor
  3. Infection strongly suspected
  4. Fracture strongly suspected

- Electromyography (EMG)
  May be useful to identify focal neurological dysfunction in patient with leg symptoms lasting more than 4 weeks

- Sensory evoked potentials (SEPs)
  - Spinal stenosis
  - Spinal cord myelopathy

Observation (Follow-up) to check for
- Change in symptoms
- According to the condition

Prevention
- Regular exercise
- Optimize weigh - reduction
- Proper posture
- Proper working environment
- Proper weight lifting technique

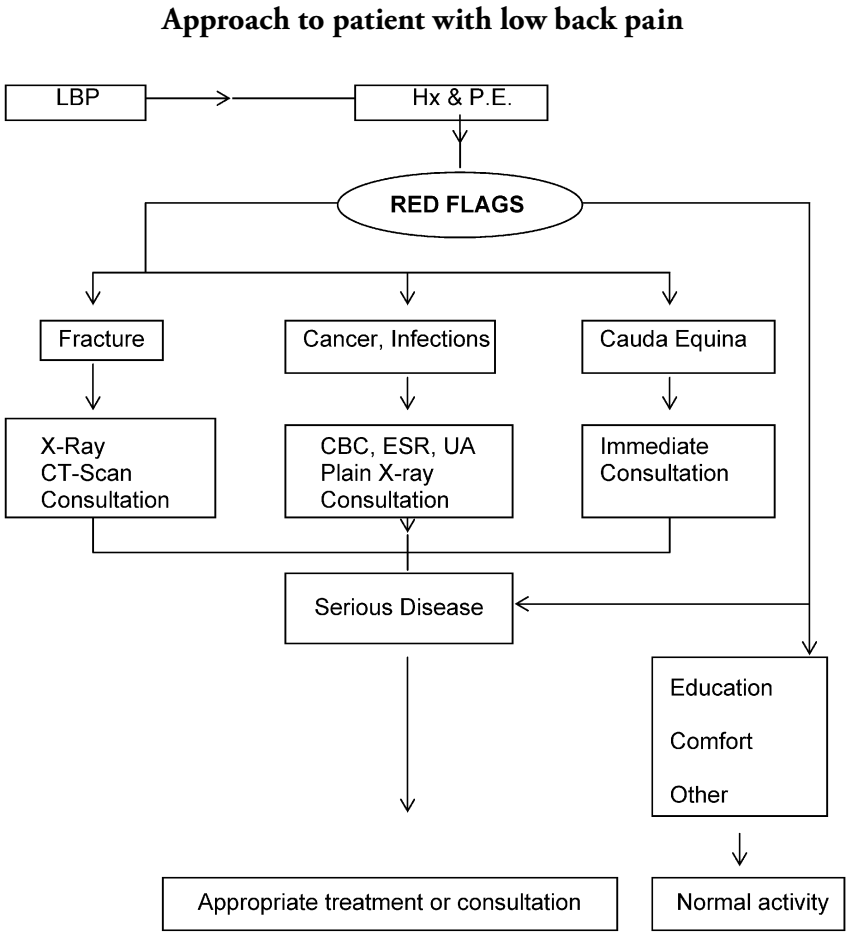


Fig. 11: algorithe for low back pain

Skin Lesions

The prevalence of skin lesions is around 20% in the community, only 25% of them consult doctors forming 14% of family physician consultations. The problem usually is not threatening and seems to be simple to the physician but to the patients it can be socially embarrassing and could alter their life. Cancer arising from skin can be fatal.

Definitions and Classifications:

Skin lesions can be classified into two main categories:

1. Primary: The initial manifestation of a disease.

1. Macule: Aflat, non-palpable, area of skin discoloration.

2. Papule: An elevated, palpable, solid area of skin less than 0.5 cm in diameter.

3. Plaque: An elevated area of skin more than 2 cm in diameter that has a larger surface area compared to its elevation above the skin.

4. Wheal: An elevated rounded or flat topped area of dermal edema that disappears within hours.

5. Vesicle: A circumscribed, elevated fluid-containing lesion less than 0.5 cm in diameter.

6. Bulla: A circumscribed, elevated fluid-containing lesion greater than 0.5 cm in diameter.

7. Pustule: A circumscribed, eleveted pus –containing lesion.

8. Nodule: An elevated, palpable solid lesion greater than 0.5 cm in diameter.

9. Petechiae: A red –purple non-blanching macule less than 0.5 cm in diameter, usually pinpoint in size.

10. Purpura: A red-purple non-blanching macule greater than 0.5 cm in diameter.

11. Teleangiectasia: A blanchable dilated blood vessel.

2. Secondary: May result from primary lesions or created by scratching or infections

1. Scale: An accumulation of dead, exfoliating epidermal cells.

2. Crust: Dreid serum, blood, or purulent exudate that accumulates on the skin surface

3. Erosion: Asupefecial loss of epidermis, leaving a denuded, moist surface;heals without scarring because it does not penetrate through dermal –epidermal junction.

4. Excoriation: A linear erosion produced by scratching

5. Ulcer: A loss of epidermis extending into dermis; heals with scarring because it penetrates into dermis

6. Scar: Replacement of normal skin with fibrous tissue as a result of healing.

7. Atrophy: Thinning of skin.

8. Lichenification: Thickening of epidermis with accentuation of normal skin markings.

Differential Diagnosis

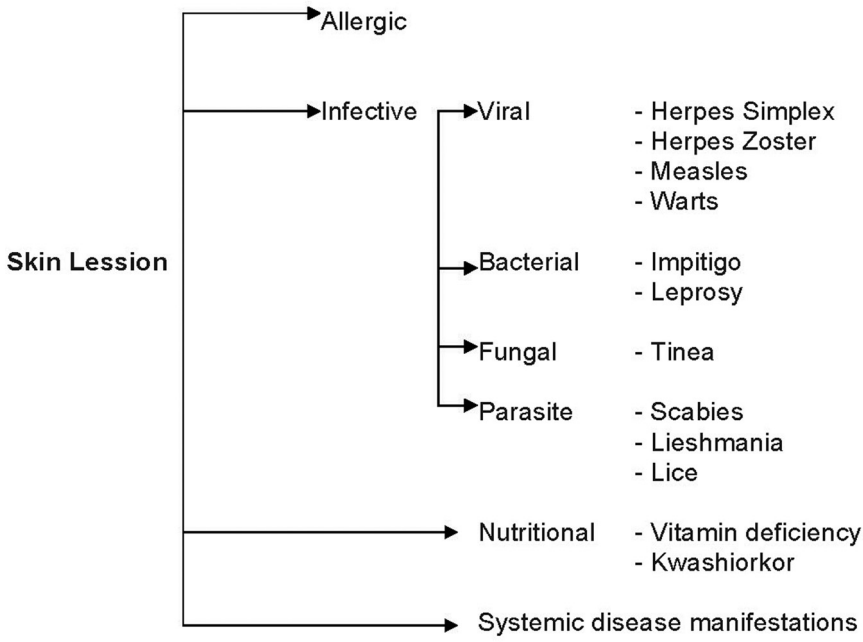


Fig 12. differential diagnosis of skin lesions

Interviewing

Aim:

- To minimize the differential diagnosis
- To guide management
- To establish rapport

Age: Some skin diseases appear in specific ages, e.g. acne in adolescents

Job: Some skin lesions are related to occupaions, e.g. contact dermatitis, use of rubber gloves (surgeons)

Chief complaints:

Time of onset: acute: Hours**,** or days
chronic: Longer period

Duration and site of individual lesion: e.g. Urticaria: lesions come and go within 24 hours period while herpes simplex or fixed drug eruptions last for 7 – 10 days at the same site.

Site: Some skin diseases have specific site e.g. face and hand: sun related

Course of the lesion since it appearance*:* change in size or colore.g. malignant melanoma

Aggravating and relieving factors:

- Sunlight, temperature etc.
- Irritants e.g. hand eczema caused by detergents

Associated symptoms*:* Pain, itching, fever, etc. e.g. in scabies there is a severe night itching.

Risk factors:

- Family history of allergic disease
- Job-related contact with allergic or infectious disease
- Contact with other person having same problem
- Chronic disease e.g. Diabetes Mellitus
- Autoimmune diseases

Systems (organs) involved:

1. Skin
2. Any other system according to differential diagnosis

Complications (impact)

- Secondary lesions: e.g. ulcers
- Pain or itching
- Effect on his job. e.g. receptionist with vetilligo

Past Medical History:

- Dermatological:
  - Eczema
  - Psoriasis
  - Atopic Eczema
- Medical:
  - Hay fever
  - Asthma

Family History:

- Genetic: Atopic eczema, ichthyosis
- Catching from others: e.g. scabies

Drug history:

1. Prescribed drugs:

***Type*:**

- Steroids
- Antibiotics
- Anti-fungals
- Moisturisers

Preparation:

- Ointments
- Creams
- Oral

Dose:

Compliance: *Patient compliant or not*

Outcome:

- Some help
- Useless
- Any side effects or interactions

2. *Drug abuse:*

- Steroid
- I.V. drug abuse
- Other

Lifestyle:

- ***Diet*:** related to skin lesion.e.g. high-fat diet
- ***Exercise***: e.g. extensive sun exposure during exercise
- ***Hobbies***: e.g. recreation in sun
- ***Smoking***
- ***Alcohol***

Psychosocial:

Idea*:*

- Patients' belief regarding his problem.
- Patients might think it is a simple thing and it will disappear
- Patient may think he got it from his colleague or close friend
- Patient may think it is related to black magic

Concern:

- Patient may think it is serious e.g. Melanoma
- He may think it is infectious to his partner or children
- He may be upset that lesion will affect his job.
- He may be planning to marry soon and think it will affect them.
- He may think his problem can be transmitted to her/ his siblings.

Expectations:

- Patient might expect from his physician to reassure him that there is no serious underlying cause, it is not infectious and it is a self limiting disease.
- Patient might expect a referral to a well known dermatologist.
- Patient might expect from the physician to prescribe him a new medication that can help him early i.e. before a special occasion e.g. wedding.

Effect: Psycho-social effects of the lesion could be reflected on the patients' work or social environment and on his professional and personal relationships e.g. skin warts and tags.

Depression: Physician should screen for symptoms of depression starting from major criteria and then proceed to minor one. Some skin problems e.g. vitilligo or acne can affect some patients especially adolescents or those in special jobs.

Anxiety: Especially when the problem affects patient's job or when he/ she is waiting for a special occasion.

Stress: Physician should check for sources of stress in patient's life (work, home, social and financial) as a result of his skin lesion.

Support system:

Check for supportive people: family members, friends, colleagues or agencies which can support the patient socially or financially.

Hidden agenda:

Frequently, skin lesions themselves don't prompt an office but come up as an "Oh, by the way, doctor" at a visit for other reasons".

Physical Examination

Aim:

- To determine the diagnosis
- To maintain doctor-patient relationship
- To determine patient comfort.

General observation of the patient

- Ill or well looking
- Weight and height (BMI), case finding

Vital signs:

- Temperature? Infections or other febrile illneses
- Blood pressure, case finding

Examine the whole skin including oral cavity using good light.

Examination of individual lesion: (you can use hand lens). Table 19, 20

- Inspection
- Palpation
- Examination of regional lymph nodes

Table 19. Description of skin lesions

1. Distribution	Symmetrical / asymmetrical
2. Site	Sun exposed / scalp / nails / mouth /genitalia / other
3. Arrangement of lesions	Single / multiple, discrete Unilateral, Generalized Disseminated, Grouped, Annular Linear (*koebner*) Serpigious (snake-like)
4. Shape of the lesion	Round, Oval, Irregular, Pedunculated
5. Erythema	Erythematous / non-erythematous
6. Color	Pink / Red / Purple (due to blood) White (loss of pigment) Brown (melanin, hemosidrine) Yellow (Lipid) Golden
7. Surface features	Normal, Scaly, Keratin, Exudate, Friable Crust, Warty / Papilomatous, Excoriation Lichenification, Umbilicated
8. Types of lesion: **Primary**	 Macule < lcm, Patch > 1 cm Papule < 1 cm, Nodule > 1 cm Plaque Diameter > thickness Vesicle < 1 cm, Bulla > 1 cm, Pustule

Secondary	Erosion, Ulcer, Atrophy, Fissure
Other	Wheal (papule/plaque) Cyst (papule / nodule / plaque) Scar (macule/papule/plaque) Comedone (papule) Burrow (papule) "S" shape
9. Border of the lesion	Well defined or circumscribed Poorly defined (eczema) Active edges (ring worm) Border raised above center (basal cell carcinoma)

Summary of dermatological diagnosis

Condition	**Usual Sites**	**Acute Changes**	**Chronic Changes**
Pityriasis rosea	Chest and trunk	Herald patch, salmonpink, 3-4 cm on trunk	Macular popular lesions with a Christmas tree distribution
Nummular eczema	Extensor surfaces, shoulders, breast, buttocks	Erythema, mild edema with occasional vesiculation	Crushing with excoriation
Lichen simplex chronicus	Areas within easy reach of fingers	Excoriation	Lichenification, exaggerated skin markings

Psoriasis	Knees, elbows, scalp	Erythematous papulosquamous lesions; pustules may occur	
Psoriasis	Knees, elbows, sclap	Plate like scaling, eczematous changes	
Xerosis	Extremities, neck	Plate like scaling, eczematous changes	
Scabies	Groin, hands, lower abdomen, back	Scaly, greyish burrows	Obscured by excoriations
Tinea capitis	Scalp	Greyish scaling, round areas with broken hairs	
Seborrhea	Scalp	Moist, greasy scales; crushed pinkish or orangish scalp patches	
Contact dermatitis	Exposed area or previously sensitized area	Darkening, edema	Weeping, vesicles, bullae
Atopic eczema	Dorsal of hands, feet, ears, skin creases	Dryness	Thickening, excoriation, scaling
Dyshidrosis	Palms, soles, sides of fingers	Weeping patches, deep vesicles	Desquamation, vesicles dry up

Fig 20 . Examples of dermatological diagnosis.

Management

Aim:

1. To remove itching
2. To treat the underlying cause
3. Cosmetic improvement

Clarification:

Educate patient about the diagnosis regarding: prevalence of the problem in the community, manifestation, prognosis, treatment, etc…

Reassurance:

- About the availability of treatment
- Availability of care when needed

Advise:

- Sun exposure avoidance
- Using sun screen lotion
- Skin care

Prescribing:

General measures:

- Relieve itching and scratching
  Antihistmaine:
  - Hydroxyzine
  - Timeprazine
  - Diphenhydramine

Topical therapy:

- Acute: non-occlusive creams, gels, soaks
- Chronic:Occlusive ointments, hydrophobic Ointments
  - White petroleum (Vaseline)
  - Zinc oxide ointment

Topical steroids:see table3

Three groups: Low, moderate and high potency

As a general rule: Only low potency topical steroids are recommended.

Systemic: Prescribed for conditions not responding to the treatment above. Use smallest possible dose for short period.

Note: *For Condition – Specific treatments: Check appropriate reference*

Therapeutic modalities: Cryosurgery, curettage, electrodissection and phototherapy

Table 21: Topical Steroids for Dermatosis

Generic Name of Product	**Dosing**
Lowest potency	
Hydrocortisone (cream, ointment, lotion) 0.5-2.5%	QD,QID
2.5% cream	
0.5-1% available without prescription	
Dexamenthasone (topical aerosol) 0.02%	BID,QID
Low potency	
Betamethasone valerate (cream) 0.01%	QD,TID
Fluocinolone acetonide (cream, ointment) 0.01%	BID,QID
Flurandrenolide (cream, oitment, lotion) 0.025%	BID,TID
Triamcinolone acetonide (cream, ointment, lotion, aerosol) 0.025%	TID,QID
High potency (for acute, self-limited dermatosis: avoid the face)	BID,QID
Floucinolone acetonide (cream) o.2%	BID,QID
Fluocinonide (cream, gel, ointment, solution) 0.5%	QD,
Halcinonide (cream, ointment, solution) 0.1%	BID,TID
Triamcinolone acetonide (cream, ointment) 0.5%	BID,QID

Investigations: (*usually you don't need)*

Diagnostic procedures used in dermatology:

Diascopy: Pressing a glass slide firmly against a red lesion will determine if it is due to capillary dilation (blanchable) or due to extravascular blood (non-blanchable).

KOH preparation: Used to identify fungus and yeast. Scrap scales from skin, hair, or nails and treat with a 10% solution to dissolve tissue material.Septated hyphae are revealed in fungal infections, and pseudohyphae and budding spores are revealed in yeast infections.

Tzank preparation: Used to identify vesicular viral eruptions. Scrape the base of a vesicle and smear cells on a glass slide. Multinucleated giant cells will be identified in herpes simplex, herpes zoster, and varicella infections.

Scabies preparation: Scrape skin of a burrow between fingers, side of hands, axilla, or groin. Mites, eggs, or feces will be identified in scabies infection.

Wood's lamp: Certain conditions will fluoresce when examined under a long wave UV light"black lamb".Tinea capitis will fluoresce green or yellow on hair shaft.

Patch testing: detects type IV delyed hypersensitivity reactions"allergic contact dermatitis. Non irritating concentrations of suspected allegen are applied under occlusion to the back. Development of erythema, edema, and vesicles at the site of contact, 48 hours later indicates an allergy to offending agent.

Biopsy: Type of biobsy performed depends on the site of lesion, the type of tissue removed, and the desired cosmetic result.Shave biopsy is used for superficial lesion. Punch biopsy (3-5 mm diameter) can remove all or part of a lesion and provides more tissue sample for pathology. Elliptical excisions provide more tissue than a punch and are used for deeper lesions or when the entire lesion needs to be sent to pathology.

Indications: Unilateral eczema of the breast → ? ductal adenocarcinoma
Pityriasis → ? syphilis
The diagnosis is in doubt

Referral:

Dermatologist:

- Unclear diagnosis
- Patient on multiple agents and no response

Plastic surgeon*:* If needed e.g. Medical fail or for skin graft
Ophthalmologist*:* When needed
Allergist: when needed

Observation: (Follow-up)

- If there is a change in symptoms
- According to the condition and treatment

Prevention: *(according to the condition)*

- Humid environments
- Limit exposure to cold, irritant, hot water
- Limited washing with mild soap use Dove©
- Moisturize after each exposure
- Avoid using items of others
- Avoid using medications especially steroids without prescription

Depression

Definitions:

Depression is defined as a spectrum of conditions which range from common normal response to life events with low mood to a more severe depressive disorder with characteristic signs and symptoms.

Prevalence:

In the general population: at any given time

- Around 5% have major depression [life time prevalence (17 – 30%)]
- Around 5% dysthymic disorder
- Around 10% have depressive symptoms

Classification: *DSM IV* Unipolar Depressive Disorders

1. Major depressive disorder - Single or recurrent episodes
2. Dysthymic disorder
3. Depressive disorder not otherwise specified
    - Minor depressive disorder
    - Recurrent brief depressive disorder

Risk factors:

Significant life events in order of importance:

1. Death of a loved one – child, spouse (husband or wife) or a relative.
2. Divorce or separation.
3. Loss of a job.
4. Breakdown of a relationship.
5. Moving house.
6. Adverse financial conditions.
7. Chronic painful physical illness – cancer, diabetes…

Factors that predispose to a new episode of depression.

1. A long history of depression
2. Manic depressive illness
3. Severe attack of depression
4. More than one episode that lasted for more than 2 weeks

Factors which render a person more vulnerable to get depression

1. Loss of mother before the age of 11
2. Cancer in the family
3. Women with 3 or more children under 14 years of age and living alone, with no close relationship
4. Post-natal period
5. Bereavement, especially widows with no family
6. Poor diet
7. Social isolation

Differential diagnosis:

1. Acute psychotic disorders if hallucinations (hearing voices or seeing visions) or delusions (strange or unusual beliefs) are present.
2. Bipolar disorder: manic episode (excitement or elevated mood and rapid talk) alternating with episode of low mood and sadness.
3. Alcohol abuse (if heavy alcohol abuse is present).

1. Interviewing

Presentation (Complaint):

May present initially with one or more physical symptoms (fatigue, pain)
Further inquiry will reveal depression or loss of interest. Sometimes presents as irritability.

Diagnostic criteria for Major depressive disorder*(DSMIV)*

I. At least 5 of the following 9 symptoms should have been present nearly every day or during the previous 2 weeks and have caused a significant deterioration in functioning. One of the symptoms must be a or b.
    1. Depressed mood
    2. Markedly diminished interest or pleasure in all or almost all activities
    1. Significant undesired weight change
    2. Sleep disturbance (either loss of or excessive sleep)
    3. Psychomotor agitation or retardation
    4. Fatigue or loss of energy
    5. Feelings of worthlessness or guilt
    6. Cognitive dysfunction
    7. Strong suicidal ideas, plan, or attempt

II. Symptoms are not accounted for by mood disorder caused by a general medical condition, substance abuse, or bereavement.

III. Symptoms are better accounted for by a psychotic condition.
    An easy mnemonic used to screen for depression is **SIG-EM-CAPS**

    S: Sleep problems
    I: Interest loss in life
    G: Guilt feeling
    E: Energy level
    M: Mood disturbance
    C: Concentration
    A: Appetite
    P: Psychomotor retardation or agitation
    S: Suicide

Past history: Of depression, manic depressive disorder, severe attack of depression or one episode that lasts for more than 2 weeks. Chronic illness such as diabetes, Rheumatoid Arthritis, dementia, stroke, cancer, chronic fatigue syndrome.

Family history of:

- Depression
- Mental illness
- Family discord

Drug history:

Some drugs might cause depression such as:

- Alpha-methyldopa
- Beta-blockers
- Digitalis
- Cimetidine
- Indomethacin
- Oral contraceptives
- Steroids
- Reserpine

Psycho-social history: of major life events as mentioned above:

- Work related problems (interpersonal relationship problems)
- Support system (family, relatives or friends)
- Ideas . He might think the reason is black magic
- Thought
- Expectations. He might expect from you to do CT scan, MRI or EEG

Risk of suicide should be assessed. Persons who are more prone to suicide include:

- Male sex, females are more prone to attempt suicide.
- Elderly patients
- Single males are more prone than married
- Widowed or divorced
- Recent bereavement
- Chronic physical illness especially painful ones

- Family history of suicide
- Previous attempts

The indicators of impending suicide include:

- Life events (major ones such as loss of spouse)
- Intractable (difficult) problems
- Previous attempts
- Premeditation for more than 24 hours
- Self blame and guilty feeling
- Patient is depressed and shows all manifestations
- Insomnia
- Loss of weight
- Anger
- Social isolation
- Bereavement
- Redundancy (no work)
- Abrasive family relationships

Lifestyle issues:

- Alcohol abuse, smoking heavily and drug abuse
- No exercise
- Poor diet
- Stress

Hidden agenda:

- Physical presentation instead of psychological
- Anxiety symptoms

Physical Examination

- Screen for physical disorders of interest
- Assess mental status such as appearance, mood, affect, speech, thought content, perception and cognition.
- Psychomotor retardation, poor eye contact
- Tearfulness, poor grooming, somber effect and impaired memory.

Management

Explanation and reassurance:

Nature of the problem, prevalence and prognosis

1. Depression is a common problem
2. Effective treatments are available
3. Depression is not a weakness or laziness
4. Prognosis is good with continued treatment and good compliance.

Advice (counseling)

1. Plan short term activities which give enjoyment or build confidence.
2. Resist self criticism
3. Do not act on pessimistic ideas (ending marriage or leaving job)
4. Do not concentrate on negative or guilty thoughts.
5. If physical symptoms are present, discuss link between physical symptoms and mood.
6. Ask about risk of suicide. Close supervision by family and or friends may be needed.
7. After improvement, discuss signs of relapse. Plan with patient the action to be taken.

Prescribing:

1. Consider antidepressant if sad mood or loss of interest are prominent for at least 2 weeks and lesser than 4 weeks or more symptoms of the above diagnostic criteria are present.
2. Criteria to use drugs:
   - If good response to one of the drug in past, use it.
   - If elderly or medically ill, effects are high with tricyclic anti-depressants – use SSRIs (Selective serotinin reuptake inhibitors).
   - If anxious or with insomnia – use sedative antidepressants (tricyclics).

3. Build up effective dose (antidepressants e.g. imipramine start with 25-50 mg, each night increasing up to 100-150 mg by 10 days. Lower dose if elderly or medically ill.
4. Explain how medications should be used:
   - To be taken daily
   - Improvement will build up over 2-3 weeks
   - Mild side effects may usually fade in 7-10 day of the drug use
   - Check with doctor before stopping medication.
5. Continue antidepressants for at least 3 months after improvement.
6. The commonly used antidepressants are mentioned in the following table:

Generic Name	**Brand Name aviable in Saudi Arabia**	**Common Dosage Range**	**Common Adverse Effects**
Tricyclic antidepressants			
Imipramine	Tofranil 10 mg and 25 mg available	50-300 mg daily	Sedation, dry mouth, orthostatic hypotension, prolonged QT interval
Desipramine	not available.	50-300 mg daily	Similar to but less than imipramine; commonly used in the elderly

Nortriptyline	Norpramin 25 mg a	50-150 mg daily	Fewer adverse effects compared with imipramine, commonly used in elderly
Selective serotonin reuptake inhibitors			
Fluxetine	Prozac: 20 mg	20-40 mg daily	Tremulousness, gastrointestinal upset, difficulty sleeping, sexual dysfunction
Paraxetine	Seroxat: 20 mg, CR12.5mg and CR25mg	20-50 mg daily	Same as fluoxetine, usually more sedating
Esitalopram	Cipralex 10 mg	10-60 mg daily	Less sexual dysfunction; loose stools are common
Citalopram	Cipram 20 mg		
Serotonin-norepinephrine reuptake inhibitors			
Nefazodone	Serzone: withdrawn because of hepatic side effects	150-300 mg twice daily	None consistently (no effect on sexual dysfunction)

Venlafaxine	Effexor 37.5mg and 75mg, Effexor XR75 and 150mg	75-225 mg daily (SR) or in divided doses	Sedation, hypertension
Other			
Trazodone	Trazolan: 50 and 100 mg	50-500 mg daily or in divided doses	Sedation (useful at low doses for sleep), orthostatic hypotension
Bupropion	Wellbutrin, Wellbutrin SR (not available)	300-450 mg divided three times daily or twice daily (SR form)	Agitation, lowered seizure threshold

Table 22. A guide to the selection of commonly used antidepressants table

Referral:

Indicated in the following situations:

1. If suicide risk is high. Consult and hospitalize.
2. If significant depression persists
3. Intensive psychotherapies (cognitive therapy, interpersonal therapy) may be useful in acute conditions and for relapse prevention.
4. No evidence of social support
5. Co-morbid conditions (substance abuse)
6. Failure to respond to treatment

Investigations:

- TSH (Thyroid stimulating hormone) to rule out hypothyroidism
- ECG for cardiac problems (In case of using tricyclics) in risky people.

Observation(follow up)

- For suicidal risk
- For relapse of the depression
- For side effects of the drugs used
- For compliance to drugs used

Prevention:

- Anticipation during life events
- At risk people should be monitored
- Monitor drugs on use
- Prevention of suicide (you must ask depressed patient about suicide)
- Counseling

Anxiety Disorders

Definition:

Continuous or chronic state of excessive unrealistic worry or apprehension

Prevalence:

- About 11% of all visits to family physicians are due to anxiety disorders.
- Generalized anxiety disorder occurs in 5% of population at any given year
- Panic disorders (2%) of the population
- Phobias (15-20%) of the population

Classification:

1. Generalized anxiety disorder
2. Panic disorder
3. Other anxiety disorders
   - Phobias:
     - Agoraphobia
     - Social phobia
     - Simple phobia
4. Obsessive compulsive disorder (OCD)
5. Hyperventillation syndrome

Risk Factors:

- Stresses of life
- Fears
- Substance abuse
- Family history

Diagnostic Criteria (Adopted from DSM IV)

Generalized Anxiety Disorder(GAD)

1. Excessive anxiety and worry (apprehensive expectation), is occurring quite often but not less than six months, regarding an event or activity (such as work or school performance).

2. The person finds it difficult to control the worry.
   The anxiety and worry is associated with three (or more) of the following six symptoms (with at least some symptoms present on most of the days than for the past six months).
   Note: Only one item is required in children
   Restlessness or feeling keyed up or on edge
   Being easily fatigued
   Difficulty in concentrating or mind going blank
   Irritability
   Muscle tension
   Sleep disturbance (difficulty in falling or staying asleep, or restless unsatisfying sleep)

3. The focus of the anxiety and worry is not confined to features of an Axis I disorder, e.g., the anxiety or worry is not about having a panic attack (as in Panic Disorder), being embarrassed in public (as in Social Phobia), being contaminated (as in Obsessive-Compulsive Disorder), being away from home or close relatives (as in Separation Anxiety Disorder), gaining weight (as in Anorexia Nervosa), having multiple physical complaints (as in Somatization Disorders), or having a serious illness (as in Hypochondriasis), and the anxiety and worry do not occur exclusively during Post-Traumatic Stress Disorder.

4. The anxiety, worry or physical symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning.
   The disturbance is not due to the direct physiological effects of a substance (e.g. a drug abuse, a medication) or a general

medical condition (e.g. hyperthyroidism) and does not occur exclusively during a Mood Disorder, a Psychotic Disorder, or a Pervasive Developmental disorder.

Panic disorder (*Adopted from DSM-IV)*

A. Recurrent unexpected panic attacks (defined as a period of intense fear or discomfort in which 4 or more of the following symptoms develop abruptly and peak within 10 minutes: palpitation, tachycardia, sweating trembling, shortness of breath, choking sensation, chest pain, nausea, dizziness, derealization, fear of losing control or dying, paresthesias chills, hot flushes).

B. At least 1 of the attacks has been followed by 1 month or more of at least 1 of the following: persistent concern about additional attacks, worry about the implications of the attack, or a significant change in behavior related to the attacks.

C Agoraphobia may be present or absent.

D. The panic attacks are not due to the direct psychological effects of a substance (alcohol, drug abuse, or meds) or a general medical condition.

E. The panic attacks are not better accounted for by another mental disorder.

Specific phobia

A. Marked and persistent fear that is excessive or unreasonable, cued by the presence or anticipation of a specific object or situation (e.g. flying, heights, animals, receiving an injection, or seeing blood)

B. Exposure to the phobic stimulus almost invariably provokes an immediate anxiety response, which may take the form of a situationally bound or situationally predisposed panic attack.

Note: In children, the anxiety may be expressed by crying, tantrums, freezing, or clinging.

C. The person recognizes that the fear is excessive or unreasonable. Note: In children, this feature may be absent.

D. The phobic situation(s) is avoided or else is endured with intense anxiety or distress.

E. The avoidance, anxious anticipation, or distress in the feared situations) interferes significantly with the person's normal routine, occupational (or academic) functioning, or social activities or relationships, or there is marked distress about having the phobia in individuals under age 18, the duration is at least 6 months.

F. The anxiety panic attacks, or phobia avoidance associated with the specific object or situation, are not better accounted for by another mental disorder, such as obsessive-compulsive disorder (e.g. fear of dirt in someone with an obsession about contamination), post-traumatic stress disorder (e.g. avoidance of stimuli associated with a severe stressor), separation anxiety disorder (e.g. avoidance of school), social phobia (e.g. avoidance of social situations because of fear of embarrassment), panic disorder with agoraphobia, or agoraphobia without history of panic disorder. Specify type:

1. Animal type
2. Natural environment type (e.g. heights, storms, or water)
3. Blood-injection-injury type
4. Situation type (e.g. aeroplanes, elevators, or enclosed places)
5. Other type (e.g. phobic avoidance of situations that may lead to choking, vomiting, or contracting an illness; in children, avoidance of loud sounds or costumed characters.

Differential diagnosis

Before treating anxiety disorder, a complete history and physical and lab work (if indicated) will be necessary to rule out other organic causes. New onset anxiety in an older patient should be a red flag to evaluate for other causes.

a. Endocrine: Hyperthyroidism, hypoglycemia, carcinoid syndrome, parathyroid dysfunction, pheochromocytoma, adrenal dysfunction.
b. Inflammatory: Systemic lupus erythematosus (SLE), rheumatoid arthritis (RA), polyarteritis nodosa, temporal arteritis
c. Neurologic: CNS tumors, migraine, subarachnoid hemorrhage, syphilis, multiple sclerosis, Wilson's disease, Huntington's chorea, seizure disorders
d. Cardiopulmonary: Angina, pulmonary insufficiency
e. Nutritional: Pellagra, B_{12} deficiency
f. Metabolic: Porphyria
g. Pharmacologic: Alcohol and drug abuse or withdrawal, amphetamines, caffeine, sympathomimetics, tobacco
h. Assess for other psychiatric disorders such as depression.

Diagnostic features:

Present history will reveal multiple symptoms of anxiety or tension:

1. **Mental tension:** (Worry, tense feeling, nervousness, fear, apprehension, poor concentration, on the edge, insomnia, shallow disturbed sleep).

2. **Physical tension** (restlessness, headache, muscle aches, tremors, can not relax, shoulder pain, backache, abdominal discomfort.

3. **Physical arousal** (dizziness, sweating, fast or pounding pulse, dry mouth).

4. May last for months and often recurs.

5. Often triggered by stressful events.

Past history:

- Same complaints
- Chronic worry
- Psychological problems e.g. depression, substance abuse

Family history

- Anxiety – any type
- Depression – any type
- Other psychological disorders
- Life events, death of father, mother

Psychosocial

- Family, work conditions
- Ideas
  - Patient might think this is a serious disease
  - Patient might think that he has a cardiac problem
  - Patient might expect from you to do ECG for him
- Concern expectations
- Hidden agenda

Drug history

- Sympathomimetics such as drugs for common colds
- Stimulant abuse
- Withdrawal syndrome
- SSRIs (Selective Serotonin Reuptake Inhibitors) - as a side effect

Life style

- Substance abuse (stimulants)
- Alcohol abuse
- Smoking
- Caffeine

Physical examination

- For medical illness – to exclude medically related problems such as hyperthyroidism
- Hyperparathyroidism
- Pheochromocytoma
- Cardiopulmonary problems, arrhythmia, heart failure
- Anemia

Management

Explanation and reassurance

Patients should realize that:

- Stress and worry have both physical and psychological effects.
- Learning some skills to reduce the effects of stress (and not only sedative medications) are the most effective relief.

Advice and counseling to patient and family

1. Practice relaxation methods to reduce physical symptoms.
2. Plan short term activities which are relaxing and distracting from the stressful events.
3. Resume activities which have been helpful in the past.
4. Identify exaggerated worries or pessimistic thoughts (e.g. when son or daughter is late from school, patient worries she or he might have an accident).
5. Discuss ways to challenge these negative thoughts when they occur (when he/she is late, patient should tell himself: -
   I am not going to be caught in worry again. She/he is only few minutes late, she will come home soon. She was also late last time and she came safe).
6. Structured problem solving methods may help to patients deal with stresses which contribute to worry. Ask the patient to write down the problem. List potential solutions and identify specific steps to overcome the problem.
7. Regular exercise is often helpful.

Prescribing

- For mild symptoms use Beta-blocker (Propranolol at 10-25 mg daily).
- For multiple symptoms which cause significant distress use anti anxiety drugs (Benzadiazepine) such as diazepam 5-10 mg for no longer than 2 weeks.

For Generalized Anxiety Disorder:

A. Anxiolytic: non-benzodiazepine

1. **Buspirone (BuSpar**) 5mg PO BID-TID (gradually increase to 30-60mg/day) (10 mg is available in Saudi Arabia) Does not have the sedative, withdrawal, or abuse potential seen with the Benzodiazepines. Effects of the drug may take several weeks to become evident.
   Side effects: Dizziness, drowsiness, headache.

   Benzodiazepines (BDZ): have the potential for abuse and dependence. Very effective for short term treatment of anxiety or while waiting for other medication to start working. No evidence that they are more effective than non-pharmacologic treatment when used for long period of time. All are equally efficacious.

1. Lorazepam (Ativan) 0.5-1 mg PO BID-TID (2 mg is avialble in Saudi Arabia)
2. Clonazepam (Rivotril) 0.5 mg and 2mg available in Saudi Arabia) 0.5 mg PO BID (May increase up to 2 – 10 mg/day)
3. diazepam 5-10 mg (valium): available .

   Side effects: Drowsiness, fatigue, ataxia, unsteadiness, memory impairment in elderly

B. Serotonin selective reuptake inhibitors (SSRIs)

1. Efficacious without addictive properties. Consider starting at ½ of the antidepressant dose to avoid initially exacerbating anxiety.
2. May use BDZ initially when starting SSRIs as the SSRI may not decrease symptoms for the first several weeks e.g. Venlafaxine (Effexor) starting dose 37.5 mg-75 mg QD x 4-7 days, then increase by 37.5-75 mg/day PRN up to 225 mg/day. Most frequent side effects; nausea, anorexia, insomia, headache, increased BP, especially in dose a >300mg/day.

C . Propranolol (inderal):

Starting dose 10-20 mg TID-QID.(Inderal: 10 and 40 mg available in Saudi Arabia)
Useful for prominent and somatic (as opposed to psychotic) complaints (i.e. palpitation, trembling, restlessness, motor tension). Note: Not approved for anxiety or other psychiatric problems.

D. Imipramine:

(Tofranil) and Trazodone (Trazolan),

For Panic Disorder

Before initiating treatment, discuss previous therapies (psychotherapy or drugs) the patient may have encountered and the results of the particular therapies.
The condition may be chronic, so rapid resolution of symptoms may not occur.

A. Benzodiazepines:

Used most often in the acute setting of panic disorder especially when symptoms are severely disabling. Long-term use of this class of drugs is not recommended due to the risks of abuse and/or dependence. Side effects: Drowsiness, ataxia, dizziness, cognitive impairment, hypotension.

B. Selective serotonin reuptake inhibitors (SSRIs):

All generally started at ½ of antidepressant dose

1. Sertraline (lustral): 50 mg available. Begin 25 mg PO QAM x 1-2 weeks, then increase to 50mg QD
2. Paroxetine (Seroxat): Begin 10 mg PO QD 1 week, then increase to 20mg QD
3. Fluoxetine (Prozac): Begin 10 mg PO QAM and gradually increase to 40mg QD
4. Citalopram (Cipram): Begin 10mg PO QAM and gradually increase to 40mg QD

Psychotherapy:

Cognitive-behavioural therapy,

cognitive therapy, or group therapy are some non-pharmacologic options for treating panic disorder.

Behavioural:

Avoidance of places where attacks might occur or if this cannot be done, then brief exposure initially with increase over time. Avoidance should slowly be confronted. Continued avoidance could result in serious disability and increased anticipatory anxiety.

Referral

indications:

- Severe anxiety that disturbs patient's life
- For long duration (more than 3 months)
- Anxiety with other psychological problems such as schizopherenia

Investigations:

- Complete Blood Count (CBC) for anemia
- Thyroid stimulating hormone (TSH) for hyperthyroidism

Observation (follow up)

- For recurrence
- Side effects and dependency of drugs

Prevention:

- Of recurrence
- Medication side effects
- Counseling about stressful life events

Fatigue

Definition:

Fatigue is a feeling of weariness, tiredness or lack of energy and motivation.
Alternative names:Tiredness, weariness, exhaustion, lethargy, lassitude.

Prevalence:

It is one of the common complaints that bring patients to the family physicians. It ranks among the most common 10 complaints in primary care. 15% to 40% of the community has some degree of fatigue but only about 10% of primary care adults consider it as their chief complaint. Women are 1.5 times more common to complain of fatigue than men.

Differential diagnosis:

Fatigue can be acute or chronic (more than 6 months) and can be physiologic or psychologic. Physiological fatigue is seen after physical exertion, emotional stress, boredom or lack of sleep on the other hand fatigue can be a non-specific sign of any serious physical or psychological disorder. Psychological fatigue usually starts worse in the morning and gets better as the day goes on, while physical fatigue starts mild in the morning and gets worse through the day.

Diagnosis	**% of Patients**
Depression	15.7
Diabetes	10.6
Acute infection	10.1

Adjustment reaction	9.6
Cardiovascular disease	7.9
Lifestyle cause	7.8
Anxiety	6.1
Lung disease (COPD, asthma)	4.9
Connective tissue disorders	4.7
Malignancy	3.2
Side effects of medication	2.8
Anemia	2.8
Hypothyroidism	2.6
Substance abuse	2.2
Chronic infection (TB, HIV disease	1.8
Inflammatory cause (bowel disease, hepatitis)	1.6
Neurologic disorders	0.4
Psychosis	0.1
No diagnosis made	21.4

Table 23. Differential diagnosis of fatigue:
Frequency in Primary Care Office

Diagnostic categories

A. Chronic fatigue syndrome (CFS): 5% of all chronically fatigue patients have CFS.
Criteria for Diagnosis

Major:

Persistent or relapsing fatigue or easy fatigueability, not explained by other chronic conditions, lasting at least for 6 months, that:

- Does not resolve with bed rest, and
- Is severe enough to reduce average daily activity by at least 50%

Minor

Eight minor criteria without physical criteria or six minor criteria plus two physical criteria):

- Mild fever or chills
- Sore throat
- Lymph node pain anterior or posterior cervical or axillary chains
- Unexplained generalized muscle weakness
- Myalgia
- Prolonged (>24 hours) generalized fatigue after exercise at previously tolerable levels
- New, generalized headache
- Migratory, non-inflammatory arthralgia
- One or more of the following neuropsychological symptoms:
  Photophobia
  Transient visual scotomata
  Forgetfulness
  Excessive irritability
  Confusion
  Difficulty in thinking
  Inability to concentrate
  Depression
- Sleep disturbance (hypersomnia or insomnia)
- Patient describes initial onset as acute or subacute

Physical

- Low-grade fever
- Nonexudative pharyngitis

- Palpable or tender anterior or posterior cervical or axillary lymph nodes (<2 cm in diameter)

B. Idiopathic chronic fatigue: Unexplained chronic fatigue that fails to meet the criteria for chronic fatigue syndrome.

Interviewing

Aim:

- To establish rapport
- To explore psychosocial problems

Demographic characteristics:

Name, age, sex, job

Symptoms:

- Fatigue or drowsiness (sleepy)
- Duration, acute, chronic (more or less than 6 months)
- Effect on activity at work or leisure activities
- Pattern at day or night, worse during the day
- Associated symptoms → guide to physical illness such as fever, pain elsewhere… psycho illness → pattern of fatigue (worse in morning)
- Relieving factors (sleep, rest, involvement at work or home etc…)
- Aggravating factors – exercise, work
- History of present illness onset, course, duration
- Family history
- Past medical, surgical history
- Occupational history
- Social history: Sexual dysfunction, exercise, smoking, work)
- Medication history: Antidepressant, antihypertensives, antidiabetics, diuretics, beta blockers, etc.

Life style:

- Diet, exercise, hobbies, alcohol or drug abuse
- Sleep pattern, hour shift at work

Psychosocial:

Ideas: Cause of tiredness, serious disease

Concern: Serious disease, psychological problems

Expectation: Reassurance about the cause which usually with no serious prognosis
Narcotic, alcohol
Sick leave, effect on productivity and leisure activities

Effect: Clarify the effect on work, family life, social life

Depression: Check depression criteria
Note that depression can cause fatigue as well as also antidepressant.

Anxiety: Check criteria. Anxiety and anxiolytic can be the cause of fatigue.

Stress: Fatigue might affect his productivity at work, reduce his financial gains, reduce his social and family responsibilities

Support system: Family (wife, children)w,ork (Colleagues, his supervisors), friends should give encouragement and share him in recreational activities.,community (social agencies),lubs, sports.

Hidden Agenda: Fear of malignancy
Depression
Family, social problems
Sick role behaviour, gains

Physical examination

Aim:

- To improve Dr./patients relationship.
- To convince the patient that the doctor is taking the problem seriously.
- To rule out the physical causes of fatigue such as infections.

- **Vital signs** (BP, temp., pulse…)
- **General look** of the patient
- **Screen all systems** especially
    - Cardiovascular – Heart, arteries, veins
    - Respiratory – Wheeze, obstruction
    - Abdomen – Organomegally, tenderness
    - Musculoskletal – Tenderness, swelling of joints
    - Neurological examination

Management

Clarification

- Explain to the patient, the possible causes and effects of fatigue and show that you are concerned about him.
- Prognosis: Acute fatigue shows good prognosis chronically fatigued patients continue to be so for 1 year (57% of them). Even though they continue to be productive.

Reassurance

- The acutely fatigued patients are going to get well
- The chronically fatigued patients need to be reassured that even though the disease might continue for sometime but they can lead a productive life.

Advice:

- Exercise will improve the tiredness
- Good balanced diet
- Improve social relationships

- Consider giving pamphlets about chronic fatigue symptoms
- Antidepressants and anxiolytics may aggravate the state.
- Stimulants such as amphitamines may worsen the condition.

Prescribing:

Treatment Strategy	**Level of Evidence For Effectiveness**	**Recommendation/Comments**
Cognitive behaviour	B	Patients are taught to gradually increase activity and to develop practical coping strategies
Antidepressant medication Tricyclics SSRIs MAO inhibitors	 B C B	 Lower doses than used to treat depression Favourable adverse effect profile Difficult to use because of special diet
Exercise	C	Improves functional capacity, mood, and sleep habits
Supportive therapy	C	Emphasize improved function rather than cure; discuss effects of fatigue on daily living
Immunotherapy	X	Variable results, high toxicity and expense
Antiviral therapy	X	Not shown to be effective

Abbreviations: MAO = monoamine oxidase; SSRI = Selective serotonin reuptake inhibitor.

Table 24. management of chronic fatique syndrome .

Referral

indications:

- Confusion and dizziness
- Blurred vision
- Weight loss
- Headache associated with fatigue

Investigations:

- Fasting blood sugar
- Blood for anaemia
- Thyroid function test
- Urine analysis
- Kidney function test
- Liver enzyme
- Epstein-bare virus titre
- CBC – differential

Observation and follow-up:

- To monitor change of symptoms
- Associated or new emerging symptoms

Prevention (folw up)

- Encourage exercise (such as walking, cycling, swimming)
- The exercise should be regular
- Family and social relationships should be improved
- Regular health maintenance examinations.

Insomnia

Definition:

Persistent difficulty falling or staying asleep that compromises daytime functioning.

Prevalence:

- From 15-20% of the general population is complaining of insomnia.
- The incidence of sleep problems increases with age.
- Most of the patients will try home remedies, and non-prescription drugs.
- Almost one billion dollars are spent on medication for sleep each year in the United States.

Normal sleep versus insomnia

Normal sleep has 2 main phases:

1. **NREM (Non-rapid Eye Movement) sleep** is the transition from wakefulness to sleep. Pulse, respiration, EEG are all slow. The patient goes from light sleep (Stage 1, 2) to deep or delta sleep (Stage 3, 4).

2. **REM (Rapid Eye Movement) sleep**. It is a state of mental and physical activities. Pulse and respiration are increased but muscle tone is diminished so little body movement occurs. Brain is active like (EEG) waking period and most of the dreams occur in this phase.

3. **REM and NREM** cycle reciprocally every 90 minutes and give typical picture of the polysomnogram.

Insomnia has no pathognomonic polysomnographic pattern. Some might have shorter than normal sleep time, some have less stages of 3 & 4 but most have normal somnograms.

Differential diagnosis:

It is important to note that some people are naturally short sleepers, some others might have time-limited disturbance of sleep due to life events and the elderly are generally short sleepers due to aging process.

Causes of Insomnia

1. **Psychiatric Disorders – 50%**
   A. Affective disorders: major depression, dysthymic disorder, manic depressive disorder.
   B. Character disorders: Anxiety, obsessive-compulsive, borderline, narcissistic character disorders
   C. Psychosis: schizophrenia, other

2. **Drug and Alcohol Abuse – 10% to 15%**
   A. Sedatives: alcohol, benzodiazepines, barbiturates, narcotics
   B. Stimulants: amphetamines, methylphenidate, pemoline, stimulating antidepressants (phenelzine, protriptyline), caffeine and stimulant xanthines in coffee, tea, cola, and chocolate
   C. Antiasthmatics, decongestants: terbutaline, aminophylline, phenyl-propanolamine
   D. Cigarettes

3. **Medical/Surgical Problems – 10%**
   A. Cardiovascular: nocturnal angina, orthopnea, paroxysmal nocturnal dyspnea
   B. Respiratory: chronic obstructive pulmonary disease
   C. Renal: urinary tract infections, urinary frequency
   D. Endocrine: hyperthyroidism and hypothyroidism
   E. Pain of any source

F. Delirium: dementia, infection, metabolic derangement medication toxicity (e.g. anticholinergic delirium secondary to over the counter sleep aids)
G. Sleep apnea

4. **Primary Sleep Disorder – 10% to 20%**
   A. Idiopathic insomnia
   B. Psychophysiological conditioned insomnia
   C. Phase shift
   D. Nocturnal myoclonus
   E. Persistent complaint without objective evidence
   F. Unusual polysomnographic patterns: alpha-delta sleep

5. **Situational stress**: Concerning job,family, or other problems.

Interviewing

Aim:

1. To differentiate between normal sleep pattern and insomnia
2. To find out the probable cause of insomnia

History is the key:

Full description of the problem – sleep diary is valuable and should contain:

- Time of getting to bed
- Time in bed
- Estimate of sleeping time
- Any awakenings
- Time of morning arousal
- Sleep quality
- Any associated symptoms such as urinary frequency
- Use of sedatives, stimulants (even over counter medicine)
- Alcohol abuse or substance abuse

- Inquire about depression, anxiety or any psychiatric disorder
- Occupational and travel pattern
- Interviewing spouse, family members are important (sleep apnea) – excessive snoring, apneic episodes and disturbed sleep
- Job – those working in shifts

Past history:
- Insomnia
- Psychiatric disorders
- Use of drugs that affect sleep

Family history:
- Psychiatric disorders
- Family discord
- Substance abuse, alcohol

Drug history:
- Substance abuse
- Sedation, stimulant
- Over the counter drugs
- Psychotropic drugs

Lifestyle:
- Tobacco use
- Caffeine containing drinks especially late at night
- Alcohol
- Heavy diets at night

Psychosocial

Ideas: Patient may have certain ideas about
- Cause of insomnia
- Worries – at home or work

Concerns: Patient may be concerned with
- Day function and his productivity, leisure activities
- Work and productivity
- Family problems, children at school, financial problems

Expectations: Patient may expect:
- Reassurance – about the cause and consequences
- Medications for sleep
- Sick leave from work
- Narcotic prescription

Effect of insomnia on:
- Work
- Performance at work, home, leisure time
- Financial effects of not sleeping at night

Support system:
- Spouse should help the other partner
- Family should show concern and understanding
- Friends should show also concern and understanding

Hidden agenda
- Psychiatric disorders – should be sought for
- Sick leave – should be discussed. Given only for a valid reason

Physical examination

Is guided by the findings from the interview:
- Check for respiratory obstruction
- Cardiopulmonary – Rales and wheezes indicates asthma or chronic obstructive lung disease
- Hyperthyroidism – Sweating, tachycardia, proptosis goiter-tremor
- Pain source – Examine site of pain

Management

Clarification:

- Explain cause if possible
- Resist the use of hypnotics and sedatives for their side effects and dependency
- Avoid the unnecessary disruption of sleep such as noise, light, caffeine drinking, smoking, alcohol, etc.

Reassurance:

- Not a serious problem (if not)
- Commence treatment if jeopardizing daily activity

Advice the patient about the sleep hygiene as follows:

- Avoid stimulants at night
- Avoid over the counter medications for cold
- Regular exercise
- Avoid over eating before sleep
- Relax and do not over think about sleep
- Use bed only for sleep not for watching TV or reading
- Leave bed if sleeping is not coming in 30 minutes
- Regular sleep and wake-up time
- Avoid naps especially after 5 p.m.
- Avoid tea and coffee or caffeinated drinks at night

Prescribing:

1. For depression prescribe sedative antidepressant (nortriptyline or doxepin 25-50 mg)
2. Benzodiazepines for anxiety
   - Short acting
   - for 1-3 weeks only to avoid dependence
   - Lorazepam (.5 – 2 mg at night)
3. Treat pain accordingly
4. Psychotherapy (Referral)

Referral:

For:

- Resistant insomnia
- For treatment of psychiatric disorders
- For psychotherapy
- For severe medical conditions

Investigations

Mostly irrelevant:

- Chest-x ray for cardio-pulmonary disease
- TSH for thyroid function
- Sleep studies

Observation (follow up): By sleep diary

Prevention:

- Sleep hygiene as mentioned above
- Avoid stimulants especially at night
- Life style modification – Exercise – eating habits, smoking, alcohol cessation.

Dizziness

Definition:

- Dizziness is defined as perception or sensation of oneself or one's environment is moving or room spinning.
- It also refers to a sensation of lightheadedness or faintness to spinning or a feeling of imbalance.

Epidemiology:

Dizziness is common in:

- Elderly.
- Middle aged.
- Females.
- Psychiatric patients.
- Patients on drugs.
- Patients suffering from chronic diseases such diabetes and hypertension.
    - 1% of the total visits to primary health care setting is due to dizziness.
    - 15 – 25% of patients come to emergency departments with dizziness are admitted to hospitals.
    - 5% of patients presented to primary health care with dizziness are referred to hospitals.
    - Majority of the patients presenting to primary health care settings with dizziness are self-limited.
    - Approximately, 33% of people suffer from dizziness by the age of 65 years and 50% of them will suffer from dizziness by the age of 80 years.
    - Most of the patients presenting with vertigo to primary health care are due to peripheral causes.

Differential Diagnosis

Acute Life Threatening:

a. Cerebral hemorrhage (stroke).
b. Myocardial infarction.
c. Cardiac arrhythmia.

Serious:

a. Brain tumors
b. Drug overdose.
c. Severe depression.
d. Aortic stenosis.
e. Acoustic neuroma.

Infectious:

a. Acute neurolabyrinthitis.
b. Acute vestibular neuritis.
c. Neuro-syphilis.

Metabolic:

a. Hyperglycemia.
b. Hypoglycemia.
c. Hypothyrodism.

Psychiatric:

a. Depression.
b. Anxiety.
c. Stress.
d. Panic Attacks.

Ear cause:

a. Benign positional vertigo (BPV).
b. Otitis media.
c. Acute labyrinthitis.
d. Meniere's disease.
e. Acoustic neuroma.
f. Peri-lymphatic fistula.

Central nervous system:

a. Stroke.
b. Multiple sclerosis.
c. Brain tumors.
d. Migraine.
e. Epilepsy.

Interviewing

Aims:

- To rule out the serious and life threatening conditions.
- To reassure patients.
- To guide management plan.
- To explore psychosocial issues.

Identify patient's name, age, job, marital status.

Clarify the complaint (Dizziness):

- Is it true vertigo? The patient feels perception or sensation of himself or his environment is moving or room is spinning
- Is it light headedness? it is a vague floating sensation .
- Is it pre-syncope? Feeling of an impending fainting but no loss of consciousness.
- Is it disequilibrium? An ability to keep balance usually associated with unsteady gait.
- Duration (second, minutes, hours, days).
- Frequency (acute, recurrent, chronic).
- Intensity (mild, moderate, severe).
- Aggravating factors (sitting, standing, rolling over, bending over).
- Relieving factors (sitting, standing, rolling over).

Ask about the associated symptoms:

Neurological symptoms:

- Headache (migraine).
- Numbness, tingling.
- Blurring of vision.

- Body weakness.
- Paraesthesia.

Ear symptoms:

- Hearing loss (Deafness).
- Tinnitus.
- Ear pain.
- Ear discharge.

Head & Neck:

- Neck pain.
- Head trauma.

Cardiovascular & pulmonary symptoms:

- Chest pain.
- Palpitation.
- Dyspnea.
- Chronic cough.

General symptoms:

- Fever.
- Weight loss.
- Nausea.
- Vomiting.

Assess for the risk factors:

- Head trauma.
- Age > 60 years.
- Coronary heart diseases (CHD).
- Diabetes Mellitus.
- Hypertension.
- Drugs.
- Sexuality.

Past history:

- Similar attacks.
- Head trauma.

- Chronic otitis media.
- Spondylosis.
- Recent respiratory infections.
- Head and neck surgery.

Family history:

- Similar problem in the family.

Drug history:

- Using drugs (What are they, dose, why?).
- Abusing drugs (What are they, dose, why?).

Psychosocial history:

Idea: What is the patient's idea about dizziness?

Concern: What is the patient afraid of?

Expect: What are the expectations of the patient from his doctor to do?

Effect: What are the effect of dizziness on sleep? Daily activity and work?

Depressed mood (take detailed history for depression).

Stressed patient (explore the reasons).

Anxious (look for reasons)

Hidden agenda:

Afraid of malignancy.
Wants sick leave.
Want further investigation such as (MRI).

Physical Examination

Aims:

- To determine the diagnosis.
- To reassure the patient.
- To assess the severity of the condition.

General Examination:

- Blood Pressure - supine, sitting, standing (look for postural hypotension).
- Pulse (look for arrhythmia).
- Temperature (high grade fever may indicate intracranial infections).
- Signs of anemia and polycythemia (pallor and congested face).

Cardiovascular system:

- Bruit → Atherosclerosis.
- Signs of aortic stenosis.
- Arrhythmias.

Ears, Nose, Throat and Eyes:

- Ear wax.
- Hearing tests (Weber & Rinne's).
- Visual acuity.
- Nystagmus.

Nervous System:

- Gait.
- Coordination.
- Muscle tone and power.
- Reflexes.
- Romberg test.
- Finger-nose test.
- 2^{nd}, 3^{rd}, 4^{th}, 6^{th}, 7^{th} cranial nerves.

Head & Neck:

Head & neck local tenderness.
Cervical spine tenderness and range of movement.

Special tests:

- Forced hyperventilation test (20 – 25 breath/minute for 2 minutes).
- Positional testing for benign positional vertigo (Dix-Hallpike maneuver).

Investigations

Asking for investigations will depend upon the probable diagnosis.

- CBC (if you suspect anemia, polycythemia.)
- Fasting and random plasma sugar (if you suspect hyper/hypoglycemia).
- ECG (to rule out arrhythmia).
- Audiometry (to rule in or rule out Menier's disease).
- Calori test (to confirm Benign positional vertigo).
- Plain x-rays (to rule out cervical spondylosis).
- CT scan or MRI (if you suspect stroke and brain tumors).
- EEG (if epilepsy is suspected).

Management of common conditions that present with dizziness

Acute vestibulopathy:

- Usually preceded by viral upper respiratory tract infections.
- Acute onset of vertigo which lasts hours to days.
- Associated with nausea and vomiting.
- Improves gradually over days.
- No hearing loss or tinnitus.
- Acute phase is associated with horizontal nystagmus.
- Lie on the affected ear will limit the sensation of vertigo.
- Has benign self limited course.
- No need for any treatment except reassurance.
- Can be treated by giving diphenhydramine 50 mg every 4 – 6 hourly.

Benign paroxysmal positional vertigo (BPPV):

- Affects all ages mainly the elderly.
- Affects females more than males.
- Reccurs frequently for several days.
- Attacks usually brief and last less than one minute.
- Attack not associated with nausea, vomiting, hearing loss or tinnitus.

Diagnosis is usually confirmed by head position test (Dix-Hallpike maneuver) which is performed as following:

a. The patient head is rapidly taken to a head hanging position 30° below the level of the couch.

1. Straight.
2. Rotated to right.
3. Rotated to left.
4. Hold on for 30 seconds and observe carefully for vertigo and nystagmus.

- The hearing test is normal.
- Recovery will take place within a week.
- Recovery is common.
- Treatment includes:
  - Explanation.
  - Reassurance.
  - Positional vestibular exercise.
  - Drugs are not recommended.

Menier's disease:

- Occurs due to accumulation of endolymph.
- Occurs between 30 – 50 years.
- Triad of diagnosis are: vertigo, vomiting and tinnitus.
- Additional feature: Progressive neurosensory deafness.
- Acute onset.
- Patients do not like head movement.
- Nystagmus occurs during attacks.

- Audiometry (reveals sensori-neural deafness (low tone).
- Treatment includes:
  - Reassurance and explanation.
  - Reduce salt intake, coffee, tobacco.
  - Betahistidine 8mg orally TID.
  - Hydrochlorothiazide 12.5 mg orally OD.
  - Surgery may be needed in special cases.

Serious disorders causing dizziness

Neoplasm:

- Posterior fossa tumors
- Acoustic neuroma:
  - Unilateral tinnitus.
  - Unilateral hearing loss.
  - Unsteady gait.
  - Diagnosed by MRI.

Cardiac syncope:

- Myocardial infarction (diagnosed by ECG & cardiac enzymes).
- Aortic stenosis (diagnosed by Echocardiography).
- Arrhythmia (diagnosed by ECG & Holter monitoring).

Cerebrovascular causes:

- Vertebro-basillar insufficiency.
  - Severe vertigo.
  - Hiccough.
  - Dysphagia.
  - Diagnosed by MRI.

Drugs associated with dizziness

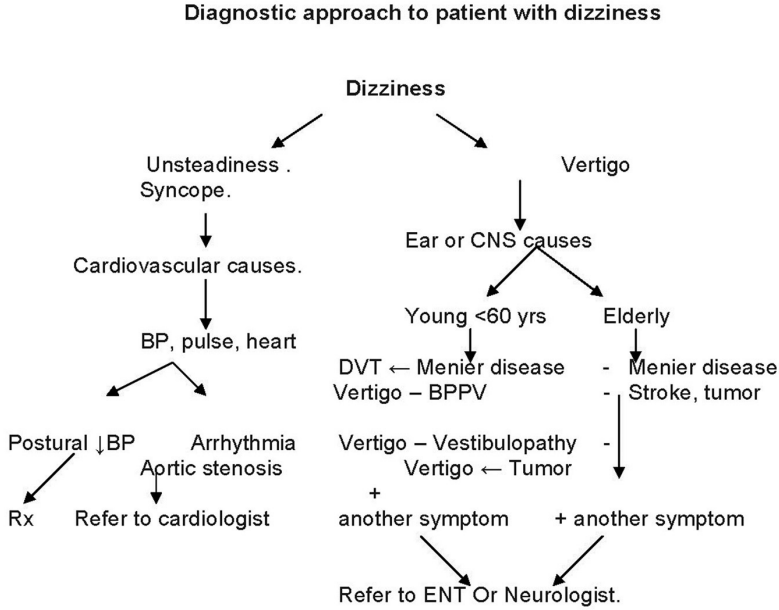
- Alcohol.
- Aspirin.
- Aminoglycoside and Tetracycline.
- Anti-epileptic drugs.
- Anti-depressants.

- Anti-hypertensive.
- Anti-histamines.
- Anti-malarials.
- Diuretics.
- Tranquillisers.
- Cocaine.

Referral of patients with dizziness:

- Vertigo of uncertain diagnosis.
- Suspicion of tumor.
- Suspicion of stroke.
- Suspicion of chronic otitis media.
- Vertigo following head trauma.
- Menier's disease.
- Benign positional vertigo that does not improve with time.
- Suspected cardiac causes.

Diagnostic approach to patient with dizziness



↓BP = hypotension
DVT= deafness, vertigo, tinnitus.
BPPV= benign paroxysmal positional vertigo
ENT= Ear, Nose, Throat

Headache

Definition:

Headache is defined as any pain or discomfort in any part of the head.

Epidemiology:

- Headache is one of the common ten symptoms in general practice settings.
- About 85% of the population will have headache within one year.
- About 38% of the adults will have a headache within two weeks.
- About 10% of adults are affected by migraine.
- About 40 millions of Americans visit their doctor for headache annually.
- Most of the patients present with headache have no serious underlying causes.

Risk factors:

- Stress at work (overwork) or at home.
- Oral contraceptive.
- Caffeine.
- Nicotine.
- Sex (F > M).
- Age (15 – 55 years).
- Family history (migraine).
- Head trauma.
- Hypertension.
- Drugs (many drugs can cause headache).
- Food (chocolate, orange, citrus, cheese, tomatoes (migraine).
- Climate change (migraine).
- Allergy and perfumes (migraine).

- Acute respiratory tract infections (ARIs).

Differential Diagnosis:

- **Very common but not serious**
  Acute respiratory infections.

- **Common and not serious:**
  Tension headache.
  Migraine.

- **Rare but serious:**
  - Sub-arachnoid bleeding (SAB).
  - Intracranial haemorrahge.
  - Carotid and vertebral artery dissection.
  - Temporal arteritis.
  - Cerebral venous thrombosis.
  - Brain tumor (primary or secondary).
  - Pituitary tumor.
  - Meningitis.
  - Encephalitis.
  - Intracranial abscess.
  - Eye herpes zoster.
  - Intracranial haematoma.
  - Glaucoma.
  - Benign intra-cranial pressure.

- **Rare and Less Serious:**
  - Errors of refraction.
  - Sinusitis.
  - Post traumatic headache.
  - Hyperglycemia.
  - Depression.
  - Anxiety.
  - Stress.

Interviewing

Aims:

- To rule out serious causes.
- To reassure the patient.
- To explore the psychosocial issues.
- To clarify the diagnosis.

Patient bio-demographic data:

Sociodemographic characterstics

Name, age, occupation, etc.

Chief complaint:

- Site of the pain: unilateral or bilateral, front, back.
- Radiation (neck, shoulders, eyes, teeth).
- Quality: sharp, throbbing, constant, pounding.
- Severity: Mild, severe (as indicated on 1-10 scale).
- Frequency: daily, weekly, monthly.
- Duration of attack (minutes, hours, days).
- Onset: Acute, chronic, recurrent.

Aggreavting and relieving factors of headache

Aggravating Factors	Relieving Factors
Food	Sleep
Drugs	Rest
Smoking	Darkness
Bright light	Vomiting
Noise	Drugs
Perfumes	Sitting
Stress	Standing
Exercise	
Kneeling	

Fig.25 Aggreavting and relieving factors of headache

Associated symptoms:

- Visual aura: precede the attack (migraine).
- Vomiting, nausea.
- Dizziness/vertigo (serious pathology).
- Fever (infections).
- Diplopia (serious pathology).
- Neck pain (muscular or rheumatic pain).
- Irritability (serious pathology).
- Running nose (cold, sinusitis).
- Cough (respiratory infections).
- Sore throat (respiratory infections).
- Red eye (glaucoma, viral infection, auto-immune diseases).
- Decrease vision (glaucoma, temporal arteritis).
- Facial pain (sinusitis, dental abscess).
- Ear pain (otitis media).
- Eye pain (glaucoma, eye strain).
- Seizure (intracranial pathology).

Systemic review:

- Rigor.
- Sweating.
- Cough.
- Bleeding.
- Joints pain.
- Diplopia.
- Flashing.

Past history:

- Similar attacks.
- Head trauma.
- Previous infection of sinuses.
- Any previous health problem.

Family history:

- Similar attack in family member.
- Family history of migraine.

Drug history:

- Current use of drugs for any other health problem (type, dose).
- Use of drugs for headache.
- Use of illicit drugs (addictives).
- Use of psychiatric drugs.
- Use of I.V. drugs.

Life style:

- Sleep.
- Sexual behaviors.
- Diet.
- Exercise.
- Smoking.
- Hobbies.
- Drugs and alcohol.

Psycho-social history:

- Idea: patient thinking about serious pathology.
- Concern: patient wants to rule out serious causes.
- Expectation: patient expects from his doctor to ask for brain, CT scan, referral to neurologist, giving him /her sick leave, prescribe prophylaxis for headache.
- Effect on (sleep, work, family, relationship with friends).
- Depression (check for other symptoms of depression).
- Anxiety (check for other symptoms of anxiety).
- Stress (Jobs, social, financial).
- Support (from family, supervisor, friends, agencies).
- Hidden agenda (patient wants drugs for his addiction or sick leave).

Physical Examination

Aims:

- To rule out the serious diagnosis such as meningitis, intracranial bleeding and tumor.
- To determine the secondary cause of headache if any.
- To reassure the patients.

General exam:

- Patient status: in pain, comfort, anxious.
- Vital sign: Blood pressure, pulse, temperature.

Head and Neck exam:

- Scalp (tenderness, wound, temporal tenderness).
- Stiffness.
- Sinus tenderness.
- Neck movement (flexion and extension).

Eye exam:

- Snellen's chart (visual acuity and errors of refraction).
- Pupil exam: response to light.
- Eye ball tenderness.
- Ophthalmoscopy

Neurological exam:

- Muscle power and tone.
- Sensation.
- Reflexes.
- Special test (Kernig's sign)

Teeth (caries, abscess).

Ear (signs of otitis media and externa).

Cardiovascular system:

- Blood Pressure, pulse and heart sounds.

Management

Aims:

- To identify patients with life-threatening conditions who need urgent referral.
- To identify those with secondary causes of headache and need investigations.
- To relieve symptoms and provide prophylaxis if needed.
- To identify the type of headache "migraine, tension).

- To educate the patient's concern:
  - Nature and the types of the headache.
  - Prognosis.
  - Prevention.

Non-pharmacological treatment (general advice):

- Avoid triggering factors.
- Manage stress (bio-feedback, relaxation, deep breathing exercise).
- Bed rest in dark and quite room.

Pharmacological drugs:

Tension headache:

- Paracetamol 1 gram PRN or TID.
- Ibuprofen 400 – 600 mg TID.

Migraine attack:

Mild attack:

- Patient should take rest in quiet dark room.
- Patient is advised to use cold packs on the forehead.
- Patient should avoid drinking coffee, orange or tea.
- Patient is advised not to move around, watch TV or read journal.
- Prescribe Paracetamol 1 gram stat.
- Prescribe anti-emetic drugs (10 mg Metoclopramide stat).

Moderate attack:

- Patient should be managed as above (plus)
- Ergotamine + caffeine ((Cafegot) orally stat.
- Sumatriptan(50 – 100 mg at the beginning of prodromal symptoms) and repeat after two hours if no good response.(maximum dose 300 mg/24hrs).

Severe attacks:

- Dihydroergotamine 0.5 mg IM or IV.
- Metoclopromide 10 mg I.V. slowly over 2 minutes or
- Sumatriptan 6 mg S/C or 25-50 mg orally stat.

Contraindication of Sumatriptan are:

- Hypertension.
- Coronary Heart Disease.
- Pregnancy.

Prophylaxis for migraine:

Indications:

- Frequent attacks that disturb work and daily life activities
- (≥3 attacks/month).
- Poor response to therapy for acute attacks.

Medications:

- Propranolol 40-320 mg /day.
- Amitriptyline 10-175 mg /day.
- Calcium channel blocker (Nifedipine or Verapamil).
- NSAIDS: Naproxen, indomethacin, Ibuprofen.
- Gabapentin.

Red flags of headache (Need Urgent Referral):

- Headache of sudden and severe onset or persistent.
- Headache associated with fever or vomiting.
- Headache associated with change of consciousness.
- Headache which worsens with kneeling or coughing.
- Headache associated with neurological symptoms or signs.
- Headache of new onset in elderly.
- Headache associated with severe high blood pressure or high temperature.
- Headache associated with signs of meningitis.
- Headache associated with tender temporal artery.

Short note about rare & serious conditions causing headache:

Temporal arteritis:

- Usually affects persons above 50 years old
- Its incidence 3-5/ 100,000.
- It affects the temporal region.
- It is severe burning and constant in nature.
- It may be associated with malaise and decrease in visual acuity.
- ESR is usually above 55 mm/hr.
- The definite diagnosis is made by biopsy.
- It is treated by giving oral Prednisolone 60-100 mg OD.

Frontal sinusitis:

- It presents with frontal or retro-orbital constant pain which starts at 9 a.m. and increases in intensity till mid day.
- There is frontal sinus tenderness.
- Edema of upper eyelid could be present.
- Treatment includes steam inhalation, antibiotics (Amoxycillin/ Augmentin), and analgesic (Paracetamol, NSAIDS).
- Referral is indicated if no response to the above medications.
- Complications include orbital cellulites, sub-dural abscess, osteomyelitis and Cavernous sinus thrombosis.

Subarachnoid Hemorrhage (SAH):

- Incidence 12: 100,000
- About 40% of patients die before treatment.
- Headache of SAH is sudden in onset, severe and is located in occipital region..
- Pain and stiffness of the neck can occur.
- Vomiting can occur.
- Loss of consciousness may occur with progressive bleeding.
- Kernig's sign is usually positive.
- Neurological signs include hemi-plegia, third cranial nerve palsy.
- CT scan is diagnostic.
- Patients who are suspected to have SAH should be referred to hospital urgently.

Meningitis:
- The headache is severe, constant and generalized.
- Fever, vomiting, neck pain and stiffness are present.
- Kering' sign maybe positive.
- Patient should be referred urgently to hospital.

Increased intracranial pressure (ICP):
- ICP is manifested by generalized occipital headache of dull, deep and steady in nature, which is aggravated by coughing, vomiting and sneezing.
- ICP could be associated with vomiting, dizziness and seizure.
- CT scan is diagnostic.
- Patients suspected to have ICP should be referred to hospital urgently.

Intra-cerebral tumors:
- Incidence 5 – 10/100,000.
- 7% manifested by headache.
- Investigation of choice is either CT or MRI.
- Patient should be referred to hospital.

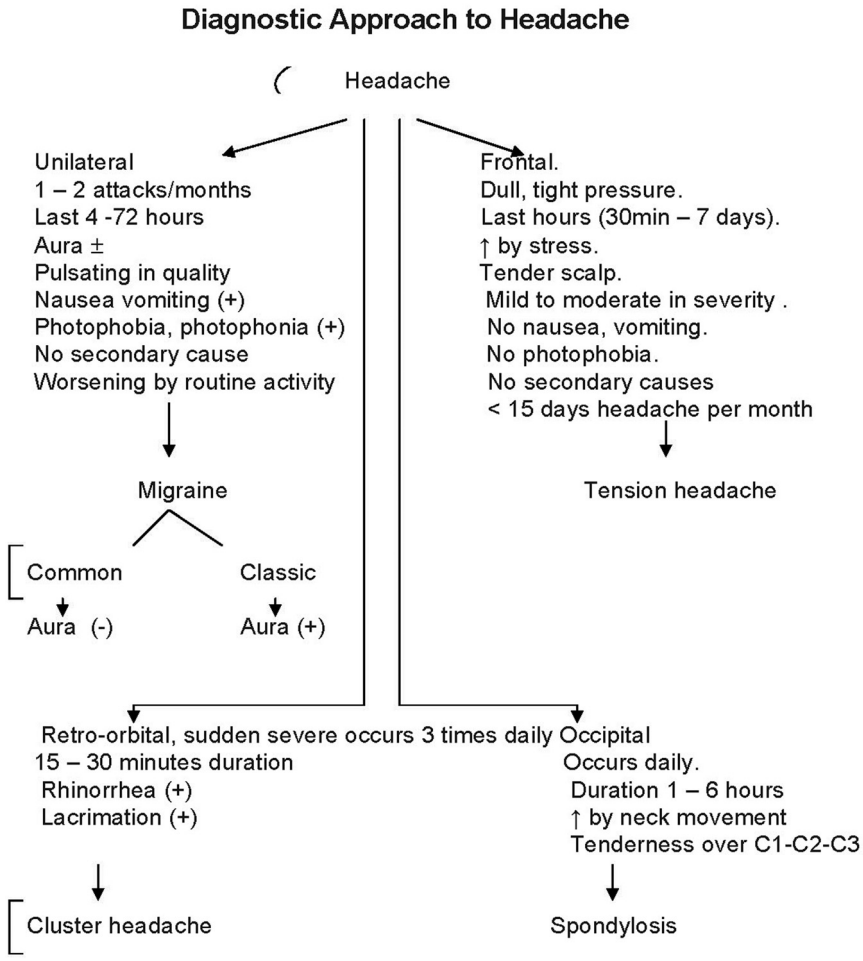
Investigations of headache:
- Most of the cases of headache do not need any investigation.
- MRI or CT scan is indicated if:

a. Headache of recent onset.
b. Headache begins in those who are more than 50 years of age.
c. Headache worsening with time.
d. Suspected secondary cause of headache.
e. Headache associated with seizure or neurological signs or symptoms.
f. Headache associated with personality changes.
g. History of head trauma.
h. Headache of new onset in patient suffering from cancer.

Significance of investigations:
- CBC (anemia or polycythemia).
- ESR (Temporal arteritis)
- Blood glucose (hypo/hyperglycemia).
- Lumbar puncture (meningitis).

- Face CT scan (sinusitis).
- Hormonal assay (pituitary adenoma).
- Skull X-rays (trauma, sinusitis, malignancy).
- Spine X-rays (degenerative arthropathy)

Diagnostic Approach to Headache



Sore Throat

Definition:

Pain or discomfort in the throat (Pharynx).

Epidemiology

- One of the most common four reasons of visiting family physicians.
- 5% of consultations are due to sore throat.
- Most of the sore throat (50-80%) is caused by viral agents, 5-35% caused by bacterial agents and less than 1% caused by candida.
- The most common affected age group is 4-8 years.
- Bacterial agents cause 20-35% of sore throat in children and about 5-10 % in adults.
- Sore throat occurs more frequently during winter and fall seasons.
- Transmission usually occurs due to hand contact with infected nasal discharge.

Risk Factors:

- Age group 4-8 years old.
- Over crowding.
- Smokers.
- Immuno-compromised persons.
- Low socio-economic status.
- Homosexuals (Viral and fungal infection).
- Drug abusers (HIV infection).
- Diabetics (Fungal infection).
- Inhaler steroid (Fungal infections).
- Mouth breathers due to nasal obstruction.

Differential Diagnosis:

Life Threatening and rare causes:

- Epiglotitis (2-4 years old).
- Peritonsillar abscess (Quinsy).
- Foreign body (acute pain, dysphagia).
- Burn (Chemical agents).

Serious and rare causes:

- Oro-pharyngeal cancer.
- Diphtheria.
- AIDS.
- Coronary Heart Diseases (CHD).
- Thyroiditis.
- Leukemia.

Acute and common but serious causes:

- Streptococcal pharyngitis and tonsillitis.

Acute and common but not serious causes:

- Viral pharyngitis (50-80%).

Chronic or recurrent but common causes:

- Irritant pharyngitis.
- Aphthus ulcer.
- Stomatitis.
- Post-nasal drip.
- Gastro-esophageal reflux disease (GERD).

Other Causes:

- Malingering.
- Dental pain

Interviewing

Aims:

- To establish and maintain good rapport with patient.
- To rule out serious and life threatening diagnosis.

- To differentiate between viral and bacterial pharyngitis.
- To guide management plan.

Chief complaint:

- Sore throat or deep pain or neck pain (location).
- Duration (serious pathology has long duration such as tumor).
- Severity (severe pain may indicate bacterial pharyngitis or epiglotitis).
- Aggravating factors (smoking, cold water).
- Relieving factors (neck extension, drugs).

Systemic review (ENT) (Respiratory):

- Headache, face pain, ear pain.
- Runny nose.
- Cough (most likely the sore throat is caused by viral agents).
- Dyspnea.
- Dysphagia.
- Hoarseness.
- Vomiting.
- Abdominal pain.
- Ear pain.
- Fever (high grade fever may indicate bacterial sore throat).
- Fatigue (most likely associated with viral sore throat).

Complications:

- Dysphagia (Quinsy, epiglotitis).
- Heart disease (Rheumatic fever may develop in 1.5 cases out of one million population).

Past History:

- Medical history:
- Same complaints (help physician to decide referral for tonsillectomy).
- Chronic problems (diabetes mellitus, bronchial asthma).
- Rheumatic fever.

- Surgical history:
- Tonsillectomy.

Family history:

- Same attacks in the family (common in viral sore throat) .

Drug history:

- Use of antibiotics in previous and current sore throat.
- Use of anti-allergics or antibiotics.
- Use of other medications such as inhalers.
- History of immunization.

Life style:

- Diet (cold fluid may induce sore throat.
- Exercise (dry mouth).
- Smoking (dry and irritated throat).
- Sex (kissing is a risk factor for infectious mono-nucleosis and homosexuality may lead to HIV infection).

Hidden agenda:

- Other problems (For sick leave).
- Referral (asking referral for tonsillectomy).
- Asking for antibiotics (patient has used antibiotics and insists for prescribing it again).

Physical Examination

Aims:

- To determine the definite diagnosis and its degree of seriousness.
- To differentiate between viral and bacterial sore throat.
- To reassure the patient.

General exam:

- Temperature: febrile or not (high grade fever could be caused by bacterial sore throat).
- Toxic, drolling of saliva (indicate epiglotitis).

- Blood pressure (case finding tool in adults as preventive measure).
- Barking cough (croup).
- Respiratory distress (upper respiratory obstruction in epiglotitis and croup).
- Stridor (croup or epiglotitis or foreign body).
- Cyanotic (upper airway obstruction).

Ear, Nose and Throat Exam:

Tonsil and pharynx appearance:

- Redness (More severe congestion and red discoloration of the pharynx could be due to bacterial sore throat).
- Exudate (Most likely due to bacterial or infectious mononucleosis).
- Quinsy (Peri-tonsilar abscess).
- Cobbling appearance of pharynx (Post-nasal drip).
- Runny nose (Viral infection).
- Sinus tenderness (Sinusitis).
- Drolling of saliva (Epiglotitis).
- Greyish pharynx (Diphtheria).
- White patches (Candida infection).
- Strawberry tongue (Scarlet fever).
- Enlarged tonsils (Tonsillitis).
- Enlarged, tender anterior cervical lymph nodes (Bacterial pharygitis).
- Enlarged, tender posterior cervical lymph nodes (infectious mononucleosis)

Management

Clarification:

- Is sore throat due to viral, bacteria, or other cause?
- Is the underlying pathology is serious or not?
- Is the diagnosis needs antibiotics or not?
- Is the diagnosis associated with complication or not (prognosis)?

Reassurance:

- The patient should be reassured:
- If diagnosis is established without complications (viral sore throat or bacterial sore throat).
- If the problem is self limited and curable.
- If the problem is severe or complicated, the patient should be reassured that there are chances to be better and most likely to get cured without complications (epiglotitis, quinsy).

Advice:

- To take rest and to drink adequate amount of fluid.
- To use drugs regularly (compliance).
- To avoid frequent weather changes.
- To use tissue during sneezing and coughing and wash hands in order to reduce transmission of infections to contacts.
- To do gargle with luke warm salt water to minimize the severity of sore throat.

Investigations:

Most of the cases of sore throat do not require investigations, except the following conditions:

- Infectious mononucleosis
- Secondary causes of sore throat e.g. (sexually transmitted diseases, post-nasal drip and coronary heart disease).
- Streptococcal pharyngitis is highly suspected.
- Atypical lymphocytosis in infectious mononucleosis.
- High white blood cells in leukemia.
- Diabetes mellitus

Prescribing drugs:

Analgesics:

- Paracetamol 15 mg/ kg /dose in children and 500-1000 mg per dose in adults
  (to relieve sore throat and fever).
- Normal saline nasal drops four times daily (to reduce nasal discharge if present).

Antibiotics:

Antibiotics are indicated if sore throat is caused by bacterial infections.

Antibiotics Regimen (the drug of choice for Group A Beta-hemolytic streptococcus):

- Penicillin –V (50 mg/kg/day divided into four doses for one week. OR
- Amoxicillin 50 mg /kg/day divided into three doses for one week. OR
- Erythromycin 50 mg/kg/day divided into four doses for one week (when patient is - allergic to Penicillin).

Referral:

- Recurrent pharyngitis or tonsillitis (> six attacks per year for tonsillectomy).
- Quinsy (urgent referral).
- Epiglotitis (urgent referral).
- Severe croup (urgent referral).
- Foreign body (urgent referral).

Prevention:

- Avoid cold fluids.
- Avoid sudden change of weather.
- Avoid contact with patients suffering from cold, cough or sore throat.
- Washing hands.

Important Clinical Points:

- Patient presenting with sore throat but without (Rhinorrhea, cough and conjunctivitis) the bacterial infection is the most likely cause.

- Patient with untreated streptococcal pharyngitis is infectious during the acute phase and one week after.

- Infectious mononucleosis is commonly seen in the age group of 15-30 years with sore throat, exudates, posterior cervical lymph-adenopathy, spleen and liver enlargement may also be possible. If these patients treated with amoxicillin or ampicillin, 90% will develop maculo-papular rash.

- Treatment of streptococcal pharyngitis with Penicillin will shorten the duration of symptoms, the infectious period and prevent rheumatic fever but not glomerulonephritis.

- There is no specific or sensitive sign or symptom for diagnosis of streptococcal pharyngitis.

- 10 – 20% of cases present with sore throat need antibiotic therapy.

Table 26. Prediction of Group A
Beta-hemolytic streptococcus according to clinical features

Clinical feature	**Points**
Age < 15 years ≥ 45 years	 1 -1
Fever> 38 °C	1
No cough	1
Tender anterior cervical lymph nodes	1
Tonsillar swelling or exudate	1
Total score	

Table 27. Assessment of risk in patient having Group A Beta-hemolytic streptococcus pharyngitis according to the total score

Total score	**Probability**	**Action**
<=0	1%	Prescribe symptomatic treatment
1	10%	Order rapid antigent test and manage accordingly
2	17%	
3	35%	
≥4	51%	Prescribe antibiotics

Red Eye

Definition:

Red eye is a complaint which is associated with red discoloration of conjunctiva or sclera. It occurs due to injury or inflammation of the anterior aspect of eye globe.

Epidemiology:

- Red eye accounts for about 8% of the eye related problems in family practice.
- Acute conjunctivitis is the most common cause of red eye in general practice (25%)
- Most of the cases of red eye are benign and self-limited.

Risk Factors:

- Exposure to chemicals.
- Exposure to sun.
- Exposure to trauma.
- Exposure to dusts.
- By use of contact lens.
- Age < one month - ophthalmia neonatorum), > 50 years (glaucoma, blepharitis).

Differential Diagnosis:

Serious causes:

- Acute glaucoma.
- Acute iritis
- Acute keratitis.
- Corneal ulcer.
- Penetrating injury.
- Orbital cellulitis.

Common and less serious causes:

- Viral conjunctivitis.
- Bacterial conjunctivitis.
- Allergic conjunctivitis.
- Foreign body.
- Blepharitis.
- Sub-conjuctival hemorrhage.

Rare causes:

- Scleritis.
- Episcleritis.
- Hyperthyroidism.
- Psychological.

Interviewing

Aims:

- To rule out the serious and vision threatening conditions.
- To guide management.

Patient Characteristics:

Name, age, sex, occupation, marital status.

Chief Complaint:

- Duration (sudden onset, gradual onset).
- Affected eye (one or both eyes).
- Recurrence.
- Location (diffuse or localized).

Associated Symptoms

- Pain and its characteristics (deep throbbing, itchy, severe).
- Diminishing vision (sudden or gradual, blurring of vision).
- Tearing (watery or mucoid, sticking eye).
- Photophobia.
- Diplobia .
- Headache.
- Runny nose.

- Exposure to (injury, chemicals, allergens).
- Severe cough (sub-conjunctival hemorrhage).
- Severe sneezing (sub-conjunctival hemorrhage).
- Severe vomiting (sub-conjunctival hemorrhage).
- Joint pain.

Past History:

- Blood disorders.
- Allergy.
- Chronic glaucoma.
- Autoimmune diseases.

Family History:

- Hay fever.
- Same condition in the family (infectious, contagious eye).

Systemic review:

- Hypertension.
- Autoimmune diseases.
- Fever.

Drug history:

- Using eye drops (what are they, if any?).
- Using any other drugs (what are they, if any?).
- Using traditional or herbal medicines (what are they, if any?).
- Using alcohol or addictive drugs.

Life style:

- Smoking.
- Diet.
- Exercise.
- Alcohol.

Psychosocial:

- **Patient idea***:* What does the patient know about his complaint?

- **Patient concern**: What does the patients afraid of?

- **Patient expectation***:* What does the patient expect from his doctor to do for him? (to treat, to refer him to ophthalmologist, to give him sick leave or to prescribe just eye drops).

- **Effect:** on work, on sleep, on social aspects.

- **Hidden agenda** (alcoholic).

Physical Examination

Aims:

- To determine diagnosis.
- To rule out the serious diagnosis.
- To reassure the patient.

Eye Examination:

- Visual acuity by using Snellen's chart.
- Pupil reaction to light by using torch.
  - Pupil size and regularity.
  - Response to light.
- Lid swelling.
- Proptosis.
- Eye movement and restriction.
- Tearing (watery, mucoid).
- Location of redness:
  - Peri-limbal (serious cause).
  - Diffuse (usually benign).
- Peri-auricular lymph node (viral conjunctivitis).
- Tender eyeball (acute glaucoma, ophthalmitis).
- Search for foreign body.
- Use fluorescein stain if there is a history of trauma or you suspect corneal ulcer or abrasion.
- Slit lamp (to measure intra-ocular pressure).

Management

Clarification:

- Nature of the diagnosis (viral, bacterial, allergic, others).
- Prognosis (cure, improve, recurrent, serious, chronic).
- Preventive measures (cleaning eyes, avoid allergens).
- Reassurance.
- Advise: use of cold compression.
- Avoid allergen and contact with the same conditions.

Drug prescribing:

Prescribing of drugs will depend upon the diagnosis (see next section).

Referral:

Referral to ophthalmologist is indicated in the following conditions:

- Foreign body.
- Glaucoma.
- Keratitis.
- Episcleritis and scleritis.
- Trauma or eye injury.
- Orbital cellulitis.

Common conditions causing red eye

Acute conjunctivitis:

Clinical features:

- Diffuse redness of one or both eyes which lasts less than three weeks.
- Watery or mucoid eye discharge.
- No eye pain, no visual disturbance, clear cornea, and normal pupil size.
- History of contact with a person suffering from the same complaint.

- Most common bacterial causes are strepcoccus Pneumoniae, Haemophilus-influenzae, Staphylococcus aureus and Neisseria gonorrhoea.
- Most common viral causes are adenovirus (85%) and Herpes simplex.

Treatment:

- Limit the spread of infection by avoiding contact with others and using their towels.
- Keep good eye hygiene.

  If bacterial infection is suspected:
- Eye irrigation with normal saline.
- Use antibiotic eye drops such as Chloramphenicol 0.5% every 2 hour for 2 days, and then every six hours for one week plus eye ointment (Tetracycline or Chloramphenicol) every night for the same period.

  If viral infection is suspected:
- Use cool compresses.
- Naphazoline eye drops six hourly.
- Watch for secondary bacterial infection.

  If herpes simplex infection is suspected:
- Acyclovir 3% ointment five times daily for 14 days
- Atropine eye drop 1% BID.

  If Chlamydia conjunctivitis is suspected:
- Prescribe systemic antibiotics (Erythromycin 250 mg QID or Doxycycline 100 mg BID for 2-3 weeks.

Allergic conjunctivitis:

Clinical features:

- Usually associated with rhinitis.
- Itchy watery eyes.
- Recurrent.

Treatment:

- Use Anti-histaminic eye drops (1-2 drops) four times daily.

- Use Artificial tears.
- Use Sodium Cromoglycate 2% eye drop (1-2 drops six hourly).

Contact allergic conjunctivitis:

Usually caused by topical allergies such as topical eye drugs and cosmetics, contact lenses or soaps.

Treatment:

- Withdraw the causative agents.
- Use normal saline compresses.
- Use Naphazoline eye drops (2 drops QID).
- If no response, refer to eye specialist.

Eyelid disorders:

Stye: Abscess of the eye-lash follicle

- Tender swelling of the lid margin (usually affects the medial side).
- Treat with hot compresses, if no response prescribe Chloroamphenicol ointment.

Blepharitis: inflammation of eyelid

Clinical features:

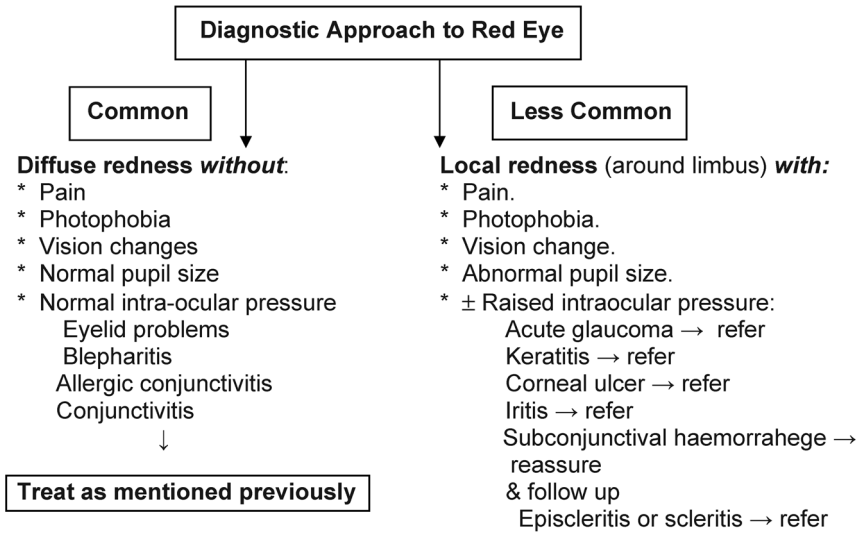
- Eye lid inflammation.
- Persistent sore eyes.
- Dry eyes.
- Lid swelling.
- Crust or scales around the base of eye lids.
- Morning sticky discharge of the eyes.

Treatment:

- Eyelid hygiene.
- For chronic cases, use hydrocortisone ointment.
- Use artificial tears three times daily.

- Use Tetracycline ointment or Chloroamphenicol ointment 1% QID.
- Avoid using cosmetics and eye lens during inflammation periods.

Fig. diagnostic approach of red eye



Chest Pain

Definition:

Chest pain is a clinical syndrome that could arise from the thorax, abdomen or musculoskeletal system.

Epidemiology:

Chest pain is one of the most common health problems which threaten the patient and the doctor because of the underlying causes.

Sometimes chest pain is caused by life threatening conditions such as myocardial infarction (MI), pneumothorax and pulmonary embolism.

Risk factors:

- Age >45 (male) & >55 (female).
- Smoking.
- Diabetes Mellitus (DM).
- Hypertension (HTN).
- Hyperlipidemia.
- Family history of Coronary Heart Diseaes (CHD).
- Trauma.
- Some Occupations.
- Overweight and obesity.
- Intake of spicy foods.
- Sedentary life.
- Anxiety.

Differential diagnosis of chest pain:

Life threatening causes	Non-life threatening causes
Cardiovascular (16%): • Myocardial infarction (MI) • Angina • Pericarditis • Dissecting aneurysm. ***Pulmonary (5%):*** • Pulmonary embolism • Pulmonary infarction • Pneumothorax • Pneumonia • Pleurisy	***Chest wall (33%):*** • Trauma • Fracture • Costo-chondritis ***Gastrointestinal (20%):*** • Esophageal spasm • Esophagitis • Gall bladder disease • Peptic ulcer disease ***Psychiatric (9%):*** • Anxiety ***Spinal dysfunction:*** • Cervical disease ***Infectious (rare):*** • Herpes ***zoster*** ***No definite diagno***sis (13%)

Interviewing

Aims:

- To rule out serious underlying causes.
- To explore psycho-social issue.
- To guide management.
- To identify risk factors of coronary heart diseases (CHD).

Patient's characteristics:

Name, age, sex, occupation, marital status.

Chief complaint and its characters

Pain:

Duration <30 or >30 minutes.
Location: Sub-sternal, localized, diffuse.

Intensity: Severe, moderate, mild (grade from 1 to 10).
Nature: Stabing, crushing, tightness, pressure, tearing, compressive, sharp, burning.
Aggravating factors: exertion, heavy meals, inspirations, coughing, palpation, movement.
Relieving factors: rest, antacid, Nitroglycerin, sitting, standing.

Associated Symptoms:

- Dyspnea, cough, heamoptysis, fever, mood changes, syncope, intolerance of fatty food.

Past History:

- Past similar attacks, hypertension, diabetes, trauma, tuberculosis, asthma, chronic obstructive lung disease and surgery.

Family History:

- Similar problem, (Coronary heart disease), pneumothorax.

Drug History:

- Anti-angina, aspirin, antacid, oral hypoglycemic agents, hypertensive agents, anti-Asthmatic, anti –tuberculosis and contraceptive pills.

Life Style:

- Diet → Spicy food, high cholesterol food.
- Exercise → Sedentary life.
- Alcohol intake.
- Smoking.

Psychosocial:

- Family health status.
- Idea → Close relative died of similar attack.
- Concern → Cardiac problem.
- Expectation → Doing ECG, refer to cardiologist.
- Effect → On sleep, sex, and work.
- Anxiety → Look for anxiety symptoms .
- Stress → Job, social, family, financial.

- Hidden agenda → Asking for report, afraid to have cardiac problem.

Physical Examination

Aims:

- To verify diagnosis.
- To rule out serious causes.
- To reassure the patient.

General Exam:

- Patient status: stable/not stable, in pain/not in pain.
- Vital signs: high or low blood pressure, tachypnea, tachycardia.
- High temperature, overweight or obese.
- Skin, mucous membrane colors and changes (Cyanosis / Jaundice/Pallor/ Clubbing).

Cardiovascular & Respiratory systems Exam:

- High or low blood pressure.
- Pulse characters.
- Raised jugular venous pressure (JVP ⅓).
- Chest: tenderness, heart apex beat deviation, decrease air entry, decreased breathing sound, creps, deformity, signs of trauma,
- Heart: first & second sound, gallop, friction rub.
- Abdomen: tenderness, guarding, Murphy's sign, organomegaly.

Investigations:

Most of the patients attending family practice do not need to be investigated, however one or more of the following investigations may be asked to rule in or rule out some specific diagnosis:

- ECG and exercise tolerance test if cardiac causes are expected.
- Chest X-rays if cardiac or pulmonary causes are expected.

- Cardiac enzyme if acute cardiac causes are expected.
- Fasting or random blood sugar if the patient is at high risk of coronary heart diseases.
- Spine X-rays if the spine pathology is suspected.
- Upper Gastrointestinal tract Endoscopy if the upper gut pathology is suspected.
- pH if the gastro-esophageal reflux is suspected .
- Barium swallow if upper gut pathology is suspected.
- Angiography if cardiac causes are expected.
- Echocardiography if cardiac causes are suspected.

Management

- Clarify the diagnosis if you are sure of it.
- Explain to the patient, the nature of the problem and its risk factor, if any.
- Explain the prognosis and the factor responsible for improvement.
- Explain how to control risk factors if any (exercise, discontinue smoking and eat healthy diet).
- Ask the patient to use medications regularly (compliance).
- Educate the patient regarding the warning symptoms and signs.
- Prescribe drugs depending upon the diagnosis:
  - Muscular and skeletal pain → Paracetamol or Non-Steriod Anti-inflammatory Drugs(NSAIDs).
  - Cardiac → Nitoglycerin (NTG), Aspirin, Beta-blocker, Calcium Channel Blockers.

Referral:

Refer urgently all the serious conditions:

- Cardiac cause.
- Esophageal spasm.
- Pulmonary embolism.

Refer other cases if not improving with the usual treatment.

Follow up:

Aims:

- To judge improvement of symptoms.
- To detect complications.
- To assess compliance with treatment.
- To support the patient psychologically.

Common Diagnosises of Chest Pain:

Muscular chest pain (33%)

- It affects young and active people.
- Pain is usually sharp and recent.
- There is a history of repeated use of arms or shoulders.
- Increases with movement.
- Radiates to neck, shoulder or back.
- No systemic manifestations.
- Physical exam: Localized tenderness.
- Laboratory investigation: not needed.
- Treatment: NSAIDs or Paracetamol.

Costo-chondritis (13%)

- It usually affect**s** young women.
- Pain with movement or with deep inspiration.
- Tender costo-chondral margin mainly left 3rd 4th margins.
- Lab investigation: Not needed.
- Treatment: NSAIDs

Gastrointestinal conditions: (19%)

- Gasro-esophageal Reflux Disease (GERD).
- Dyspepsia.
- Gastritis.

Clinical features could be described as:

- Pain which occurs on empty stomach or after meals.
- Night or morning cough.
- Dysphagia.

- Water brash.
- Pain is relieved with antacids or food intake.
- Pain could be associated with or without abdomen tenderness.

Treatment:

- Life style changes (reduce weight, avoid coffee, spicy foods, and large meals).
- Use antacids, H2 blockers.

Esophageal spasm:

Clinical features:

- Sudden onset of non-exertional squeezing sub-sternal pain.
- Relieved by antacids.
- Not affected by movement.
- Lasts minutes to hours.
- May be associated with dysphagia.
- Clinical exam is normal.
- Need specific investigations: pH, Barium meal, endoscopy.
- Sometimes, it is very difficult to distinguish between this pain and cardiac pain.

Treatment:

- Long acting Nitrate.
- Calcium Channel Blockers.

Cardiac Pain (16%)

Angina Pectoris:

Diagnosis:

- Pain → retro-sternal pain → radiate to left arm, jaw, throat, back.
- May be associated with dyspnea.

- Aggravated by exertion, stress, cold, and heavy meals.
- Clinical examination may reveal normal findings most of the time.
- ECG: normal or depressed ST segment.
- Exercise ECG is positive in 75% of patients with severe Coronary Heart Diseases.
- Coronary angiography is indicated if:
  - Positive stress ECG test.
  - Suspected left Coronary Artery Diseases.
  - Unstable angina.
  - Angina resistant to medical treatment.
  - Angina or Myocardial infarction in a patient <50 years.
  - Angina after the attack of Myocardial infarction.
  - Patient above 30 years with aortic or mitral valve diseases.

Treatment:

Prevention → Control risk factors of coronary heart disease .

Medical treatment.

- Acute attack → Give Nitroglycerin tablet. One tab Sublingual.
- Give → Nifedipine 5 mg capsule (chewing).

Tips about using Nitroglycerin

- Educate the patient about its side effect.
- Patient should sit down before taking tablet.
- Patient should take ½ tablet or one tablet every 5 minutes.
- The maximum dose of tablets are 3 tablets during 15 minutes.
- Tablet must be fresh.
- If pain is relived quickly, split out the remaining tablets.
- Ask the patient to seek medical advice if no relief after taking three tablets.

Practical points in management of angina:

- Use aspirin for patients with all types of angina 325 mg daily.
- Use Beta-blockers except for variant angina.
- For variant angina, use Nitroglycerin and calcium blockers.
- Avoid using beta blockers and Verapamil together.
- Avoid using Nitroglycerin if the patient uses Sildenafil (Viagra).

Myocardial Infarction (M.I)

Diagnosis:

- Severe retro-sternal crushing, tightness pain of long duration.
- Silent pain could occur in diabetics, hypertensives and elderly.
- 60% of patients die before reaching hospital.
- Typical ECG changes → deep Q- wave, elevated ST segment, and T- wave inversion.
- Raised cardiac enzymes.

* Troponin I:
  - Rises within 3-6 hrs and reaches to its peak after ten hours.
  - Highly sensitive and specific test.
  - Positive in unstable angina.

* CPK:
  - Rises within 6 -8 hours of cardiac pain and reaches its peak within 20-24 hours

Acute management:

- Stabilize the patient and give O2 (4-6L/min).
- Relive the pain by giving Morphine 2-5 mg IV stat.
- Give Aspirin as early as possible (300 mg) stat.

- Give B-blocker and ACE inhibitors unless contraindicated.
- Give Nitroglycerin ½ tablet Sublingual stat.
- Refer patient as quickly as possible to the hospital.

Post acute myocardial infarction management:

- Give Beta-blocker.
- Give ACE inhibitor.
- Give Aspirin.
- Give Lipid lowering agents (Statins).

Continuous management:

- Education and counseling of the patient.
- Bed rest for 48 hours.
- Early mobilization.
- Light diet.
- Beta-blocker.
- ACE inhibitor.

On discharge program:

Educate and counsel the patient about:

- Diet.
- Exercise regularly.
- Weight reduction.
- Cessation of smoking.
- Use of drugs regularly.
- Warning symptoms of recurrent MI.
- Avoid sex till 4-6 weeks after MI.

Cough

Definition:

Cough is an unpleasant complaint which occurs due to sudden reflex to clear secretion and inhaled particles from respiratory tree.

There are two types of cough; acute and chronic. Chronic cough is labeled if its duration is more than eight weeks.

Epidemiology:

- Cough is one of the most common five symptoms making patients to consult their doctors.
- The most common cause of cough is upper respiratory tract infection (URTI).
- The most common causes of chronic cough are post-nasal drip, bronchial asthma gastro-esophageal reflux disease.
- In USA, 30 million visits to doctors are for cough.
- In USA, $600 million are spend on over-the-counter medications for cough.
- A single cause of cough is ranged between 41-73%, two causes in 23-42% of patients and three causes in 3-17% of patients.

Risk factor:

- Smoking.
- Some occupations (e.g. occupational asthma).
- Family history of asthma.
- Contacts with patients suffering from tuberculosis.
- Drugs (ACE inhibitors).
- Psychogenic (psychosomatic disorders).

Differential Diagnosis:

Life threatening and serious:

- Lung cancer
- Congestive heart failure

Acute and common:

- Upper Respiratory Tract Infections (URTI)
- Bronchitis
- Influenza

Acute and less common

- Pneumonia
- Whooping Cough.

Chronic and common:

- Post-nasal drip
- Bronchial asthma
- Cough associated with smoking
- Gastroesophageal Reflux Disease (GERD).
- Chronic bronchitis

Chronic and less common:

- Tuberculosis (TB)
- Lung cancer
- Congestive heart failure(CHF)
- Interstitial Lung Disease (ILD)
- Psychogenic "anxiety"
- Drugs (ACE inhibitors, Nitrofurantoin)

Interviewing

Aims:

- To establish a good rapport with patient.
- To rule out serious conditions (cancer, CHF)
- To assess the severity and chronicity.
- To analyze the symptom and to find out the definite cause if any.

- To explore psychosocial aspect of the complaints.
- To negotiate and share management with patient.

Patient characteristics:

- Age, sex, occupation, etc…

Chief complaint:

- Duration and onset (acute or chronic).
- Continuous or intermittent (severity of the underlying pathology).
- Characteristics:
- dry (interstitial lung diseases, croup, asthma).
- productive (bronchitis, bronchiectasis)
- barking (croup).
- rusty (pneumonia)
- frothy (pulmonary edema)
- bloody (chest infection, lung tumor, TB, pulmonary infarction or embolism)
- sticky (bronchial asthma).
- Aggravating factors (dust, cold, walk, etc.).
- Relieving factors (rest, drugs, position, etc.).
- Timing (nocturnal, morning, with meals, sleep, work related).

Associated symptoms:

- Dyspnea (asthma, pulmonary edema, interstitial lung diseases).
- Orthopnea (heart failure).
- Chest pain (chest infection, pulmonary embolism or infarction).
- Haemoptysis (lung tumor, chest infections, pulmonary infarction or embolism).
- Legs swelling (congestive heart failure).
- Heart burn (Gastro-esophageal reflux)
- Night sweating (TB, Tumors)
- Throat tickling (post-nasal drip).
- Sour taste (Gastro-esophageal reflux).

- Fever (chest infection, tumors).
- Running nose (Sinusitis or common cold and postnasal drip).
- Weight loss (tumor, TB).

Past History:

- Chest infection (TB).
- Bronchial asthma.
- Upper Tract Respiratory Infections(URTIs).

Family History:

- Tuberculosis.
- Bronchial Asthma.

Drugs History:

- ACE inhibitors (may cause dry cough).
- Nitrofurantoin (can cause lung fibrosis).
- Inhalers (indicate that patient may have asthma).
- Cough remedies (to know why he uses it and who prescribed it).
- Steroids (to know why he uses it and who prescribed it).
- Diuretics (may indicate that the patient use it for congestive heart failure).
- Beta blockers (may induce cough in patients with asthma)

Life Style:

- Diet (some food can induce cough such as spicy food or heavy meals as in gastro-esophageal reflux).
- Exercise (may induce bronchial asthma).
- Smoking (may induce and cause chronic bronchitis and bronchial asthma).
- Alcohol (may induce gastro-esophageal reflux).
- Sex (HIV).

Psychosocial Aspect:

- Idea: What does he/she think of the cause of the cough? e.g. smoking.

- Concern: worry about lung cancer.
- Expectation: - Chest X-rays.
  - Referral to chest physician
- Effect: - On work (unable to attend his/her work).
  - On sleep (can not sleep).
  - On family (make his/her family members discomfort).
  - On social (unable to walk).
  - On sex (unable to perform his normal sexual activity).
- Hidden agenda:
  - Other problem (want to be given cough syrup for his wife).
  - Afraid of lung cancer.
  - Asking for sick leave.
  - Real reason for visit.

Physical examination

Aims:

- To reassure the patient
- To maintain patient-doctor relationship
- To find out the clues for definite diagnosis

General:

- High temperature (chest infection).
- Anorexia, weight loss (cancer, Tuberculosis).
- Pallor (anemia, chronic diseases).
- Tachypnea (Chest infection, CHF, respiratory failure).
- Cyanosis (respiratory disease, Heart failure).
- Dyspnic (congestive heart failure, chronic obstructive or restrictive lung diseases).
- Clubbing (cancer, chest infection, restrictive or obstructive lung diseases).
- Wheezing (asthma, bronchitis).

Ear, Nose, Throat (ENT):

- Cobbling of throat (Post nasal drip).
- Boggy pale nose (Post nasal drip).
- Tender sinuses (sinusitis).
- Nasal discharge (sinusitis, common cold).

Chest examination:

- Decrease air entry on tactile vermitus and or dullness (pneumonia).
- Rales, bronchial breathing (pneumonia, CHF).
- Rhonchi (asthma, bronchitis).
- Coarse rales (interstitial lung diseases).

Heart examination:

- Tachycardia (Respiratory distress, Congestive heart failure).
- Gallop (congestive heart failure).
- Murmur (valvular diseases).

Abdominal examination:

- Abdomen tenderness (gastro-esophageal reflux).

Sputum observations if cough is productive:

- Rusty color(pneumonia)
- Bloody (Tuberculosis, cancer, pulmonary embolism, pulmonary infarction).
- Frothy (pulmonary edema).
- Sticky (bronchial asthma).
- Green, yellowish (bronchitis.)

Management

- Identify the nature of the problem (acute, chronic, recurrent) and explain it to the patient.
- Prognosis: good, poor (most of the causes of cough can be cured or relieved)
- Common problem (cough is one of the most common symptom making patients to come to their doctors.
- Reassurance: There is no serious problem, his/her problem can be cured or improved.
- Advise and educate concerning:
  - Discontinue smoking if the patient is smoker.
  - Avoid contact with animals if the patient is asthmatic.
  - Avoid dusty weather if the patient is allergic.

- Prescribe non-pharmacological therapy such as:
  - Life style changes (cessation of smoking).
  - Use steam inhalation if the diagnosis was croup.
- Prescribe medications if definite diagnosis is reached.
  - Bronchodialators (asthma, chronic bronchitis).
  - Inhaler Steroid (asthma, chronic bronchitis).
  - Anti-histaminic (post-nasal drip).
  - Decongestant (severe sore throat and common cold).
  - Cough remedies (severe cough interfering with work and sleep).
  - H2-blocker or proton pump inhibitors (gastro-esophageal reflux).
  - Anti-biotics (chest infection and bacterial bronchitis, sinusitis).

Investigations

- Investigations are not recommended in the first 6 weeks of cough unless serious diagnosis is suspected.
- If no improvement with drugs or no real diagnosis established after six weeks investigation should be done.
- Investigations include:
  - Chest X—rays.
  - Pulmonary function test.
  - Tuberculin test.
  - CT scan of sinus.
  - pH monitoring.

Follow up:

- Follow up of patient complaining of cough depends on suspected underlying diagnosis and severity of symptoms.

Preventive measures:

- Avoid risk and aggravating factors as mentioned earlier.
- Practise healthy life styles (avoid smoking).
- Immunization (Influenza and pneumonia vaccine in elderly and high risk groups) .

Management of common causes of acute cough

1-Common Cold

Clinical Features:

- Malaise.
- Sneezing.
- Running nose.
- Sore throat.
- Fever.
- Headache.
- Cough.

Treatment:

- Paracetamol.
- Steam inhalation.
- Increase fluid intake such as juices.
- Use normal saline nasal drop.
- No role for antibiotics.
- No role for Vitamin C.
- Cough syrup could be used if cough is severe and dry.

2-Acute Bronchitis

Clinical Features:

- Dry or productive cough.
- Wheezing.
- Chest pain may be present in severe cases.
- Fever may be present.
- Chest X-ray usually normal.

Treatment:

- Inhaler bronchodilator such as Salbutamol.
- No role for antibiotics unless severe infection associated with productive cough of yellowish color and fever.
- Mucolytic cough syrup could be used.

3-Influenza

Clinical Features:

- Fever.
- Headache.
- Muscular pain (generalized).
- Fatigue.
- Cough.
- Runny nose.
- Sore throat.
- Rigors.

Treatment:

- Rest.
- Paracetamol.
- Increase fluid intake
- Anti-viral agent.
  - Zanamivir (10 mg inhalation BID for five days) or
  - Amantadine (100 mg BID orally till 48 hours after recovery).
  - Prophylaxis influenza vaccine protect 70% for at least 12 months.

4-Croup

Clinical Features:

- Barking cough.
- Stridor.
- Affects children 1 – 3 years old.

Treatment:

- Steam inhalation.
- Refer to hospital if the attack is severe (stridor at rest, not improving with steam inhalation).

5-Pneumonia

Clinical Features:

- Cough.
- Fever.
- Chest pain.
- Malaise.
- Tachypnea.
- Decrease air entry, dullness, bronchial breathing.
- Chest X-ray (consolidation).

Treatment:

- Rest.
- Fluid.
- Analgesic.
- Antibiotics (for 2 weeks).

Typical pneumonia:

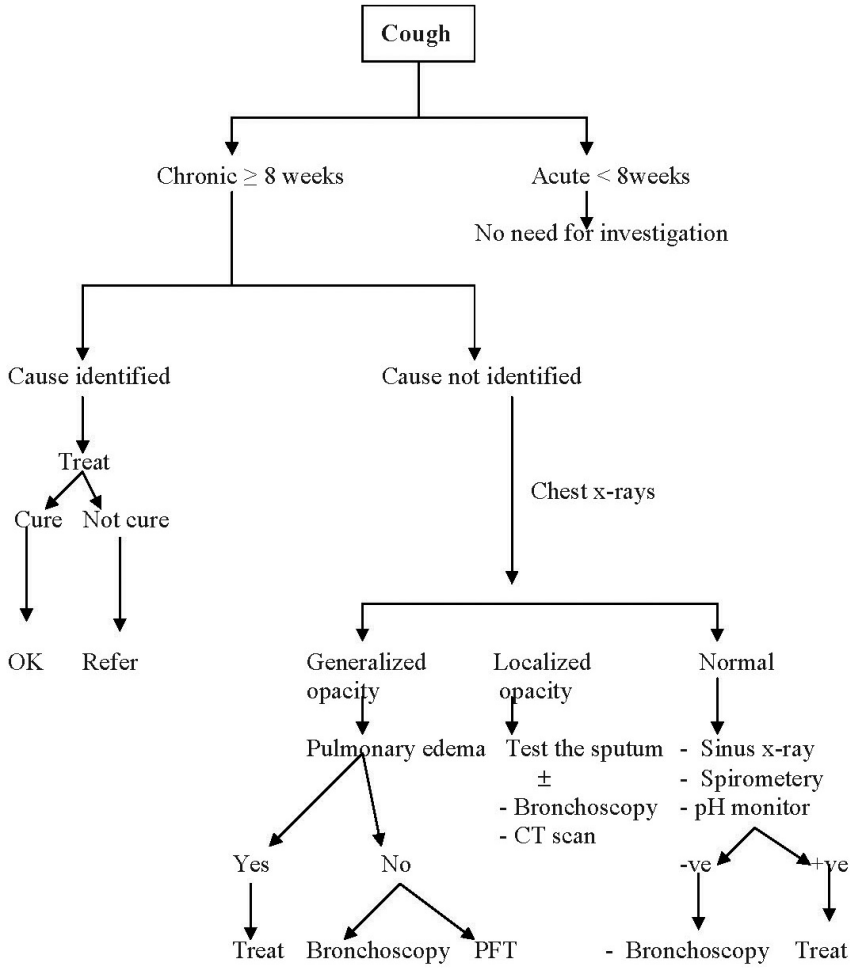
- Amoxycillin 500 mg Q8 hourly OR .
- Augmentin 500/125 mg Q8 hourly.

Atypical pneumonia:

- Doxycyclin 200 mg orally to start and then 100 mg BID.

- Referral for admission if the patient:
  - Age > 65 years.
  - Suffering from Coexisting disease.
  - High grade fever > 38 ^{o}C.
  - Respiratory Rate > 30 /minute.
  - Blood Pressure ≤ 90/60.
  - Inability to tolerate oral therapy.
  - Involvement more than one lobe of the lung.
  - WBC < 4x 10^{9}/L or > 20 x 10^{9}/L.

Diagnostic Approach to Chronic Cough



Dysuria

Definitions:

- Dysuria is defined as painful, discomfort or burning sensation during urination.
- Cystitis: infection of urinary bladder.
- Acute urethral syndrome: Dysuria, frequency or urgency in the absence of bacteria on voided urine sample.
- Bacteriuria: Presence of 10^5 or more colony forming unit of bacteria per milliliter of voided urine.
- Acute peylonephritis: Syndrome of localized loin pain associated with systemic symptoms such as chills and or fever.
- Re-infection: The recurrence of bacteriuria with an organism different from the original organism.
- Relapse: Recurrence of bacteriuria with the same isolated organism.

Epidemiology:

- Dysuria accounts for 5-15% of visits to family physician in the U.S.A.
- Every year, 25% of American women report dysuria.
- The most affected age and gender is female between 25-54 years.
- Dysuria is common among the sexually active women.
- In males, the prevalence of dysuria increases with increasing age.
- About 70% of patients suffering from dysuria have urinary tract infection.
- Recurrent urinary tract infections occur in 20% of cases.

Differential Diagnosis

Infections

More than 80% of urinary tract infections (UTIs) are caused by E.Coli.

Common Diagnosis

- Cystitis.
- Urethritis.
- Cervicitis.
- Vulvo- vaginitis.

Less common but serious diagnosis

- Pyelonephritis.
- Prostatitis.
- Orchitis

Hormonal condition:

- Post-menopausal syndrome

Trauma:

- Honeymoon cystitis.
- Riding bicycle or horses.

Malformation

- Bladder neck obstruction due to benign prostate hypertrophy (BPH).
- Urethral stricture.

Neoplasm:

- Urogenital cancer (Kidney, bladder, prostate, penis).

Psychogenic:

- Depression.
- Somatization.
- Anxiety.

Inflammatory:

- Spondylo- arthopathies.
- Auto-immune diseases.

Interviewing

Aims:

- To rule out the serious conditions such as cancers, calculi, pyelonephritis.
- To find out the definite diagnosis.
- To explore the psycho-social aspect.
- To guide the management plan.

Demographic data:

Name, age, marital status, job, etc.

Chief complaint:

Dysuria:

- Duration (long duration may indicate recurrent UTI) .
- Frequency (recurrent as in UTI and STDs)
- Severity (1-10 scale).
- Location (at the tip or middle or end of urethra).
- Timing (at the beginning, at the end of urination).
- Aggravating factors (performing sex).
- Relieving factors (drinking water).

Associated symptoms:

- Frequency of urination (very much in cystitis).
- Urgency (very common in cystitis and prostatitis).
- Hesitancy (prostatitis).
- Fever (pyelonephritis).
- Chills (pyelonephritis).
- Pain (loin, supra-pubic, scrotal, anal, back).
- Urethal discharge and its characters (color, odor e.g. urethritis).
- Vaginal discharge and its characters (color, odor, quantity e.g. vaginitis).

- Haematuria (serious pathology such as tumor, stone, nephritis).
- Polyuria (diabetes).

Systemic Review:

- Joint pain, back pain (auto-immune disease, prostatitis).
- Skin rash. (Sexually transmitted diseases)
- Eye complaints (Rieter's syndrome).
- History of menstrual cycle (dysmenorrhea).
- Sexual history (Sexually transmitted diseases).
- Dysparunia, extra-marital relationship, homosexual and heterosexual.
- Nausea, vomiting (pyelonephritis).
- Oral ulcer or pain (Behcet's syndrome).

Past medical history:

- Similar attacks (when? how many?
- Uro-genital surgery.
- Pelvic trauma.
- History of Sexually Transmitted Diseases (STDs).
- History of Urinary Tract Infections (UTIs).
- History of Diabetes Mellitus.

Family history:

- Similar attacks (Sexually Transmitted Diseases).

Drugs history:

- Using any drug (what is it?).
- Previous drug history (what was it?
- Using over the counter drugs (self-treatment, afraid to tell physician about the complaints).
- Previous injection (I.M., I.V. e.g. may indicate sexually transmitted diseases) .

Life styles:

- Sex (heterosexual, homosexual or both).
- Smoking.

- Drug abuse and alcohol intake.
- Diet (some food may help in forming renal stone such as food containing oxalate).
- Exercise (severe exercise may cause uro-genital trauma).
- Hobbies (bicycle and horse riding may cause uro-genital trauma).

Psychosocial:

- **Idea**: what do you think the cause of dysuria? New sexual partner.
- **Concern**: are you afraid to have serious disease (HIV), kidney cancer, or partner getting affected?
- **Expectation**: what do you expect from me to do for you? Ultra-sound of abdomen, or referral to urologist or giving you an injection.
- **Effect**: how does dysuria affect your life? Sexual life, movement, sleep, smell of urine, wetting of underwears .

Hidden agenda:

- Patient may ask for sick leave.
- Patient may have sexual dysfunction (impotence or premature ejaculation).
- The patient may come for emergency contraceptive.
- The patient may attend for prescribing sex stimulant pills.

Physical Examinations

Aims:

- To rule out serious diagnosis
- To find out a clue for definite diagnosis
- To reassure the patient.

General status: comfortable, anxious, worried.
Vital signs: Temperature, blood pressure and pulse.
Inspection: Uro-genital system and sex organs (rash, ulcer, skin lesion, discharge).

Palpation: abdomen, flanks, shaft of penis, perineum (for tenderness and organomegaly).

- Per-rectal Examination (PR): look for prostate enlargement and tenderness.
- Vaginal examination (PV): look for discharge, ulcers, atrophy and tenderness.
- Back examination: look for tenderness (sponodylopathy).

Investigations

All the following should be investigated for dysuria:

- All young children to rule out the underlying pathology such as reflux.
- All males most likely to have underlying pathology such as stone, sexually transmitted disease.
- All women with:
  - Acute pyelonephritis.
  - Recurrent UTIs.
  - Other features suggest renal diseases.
  - Pregnancy.

Selected Diagnostic Lab Tests:

Urinalysis

- Pyuria (> 5 WBC/high powered field (sensitivity is 91% and specificity is 48%) for UTI.
- Nitrite test (sensitivity is 53% and specificity is 98%) for UTI.
- Leukocyte Estrase (sensitivity is 88% and specificity is 71%) for UTI.

Urine culture: it is accurate for diagnosis of urinary tract infection, however it is not recommended in daily practice unless the dysuria is evaluated in children, men, and older women or those with suspected pyelonephritis or those with infections not responding to first line of antibiotics.

Vaginal or urethral swab: can detect many cases of Sexually transmitted diseases and Candida albicans.

Ultra Sound: Helpful in diagnosis of renal stones, abscess and cancers.

Plain x-ray of Kidney, ureter and bladder (KUB): can detect 75% of renal stone.

Intravenous Urography (I.V.U): can determine the function of renal system, and locate the type of obstruction in the renal system.

Voiding Cystourethrography: helpful in identification of the cause of chronic dysuria, congenital abnormality of urinary tract and vesicouretric reflux.

Cystoscopy: used to confirm urethra and bladder pathology.

Management

Clarification:

- Explain to the patient the nature of dysuria (whether it is due to UTI or uretheritis or vaginitis? Is it lower UTI (cystitis) upper pyelonephritis, others? Is it due to serious or non-serious pathology?
- Does he/she need to start treatment or to do more investigations or referral?
- Reassurance if you are sure about diagnosis (UTI, vaginitis).

Advise:

- Drink adequate amount of water (2-3 L/day).
- Avoid contact with your partner (if diagnosis was sexually transmitted diseases).
- Treat both partners (if diagnosis was sexually transmitted diseases).
- Keep good personal hygiene.
- Practice frequent voiding.
- Practice voiding before sleep.
- Practice voiding after sex.
- Avoid tight wears.
- Avoid nylon underwear.

Management of common conditions associated with dysuria

Cystitis:

- Cotrimexazole 960 mg BID for three days or
- Ciprofloxacin 250 – 500 mg BID for 3 days or
- Nitrofurantoin 50 – 100 mg QID for 3 days

Recurrent urinary tract infections:

- If occurs more than three times per year, use Cotrimexazole as half dose of the above (three times a week) or Amoxycillin 250 mg TID for one week or Nitrofurantoin 100 mg QID for 3 – 7 days .

Acute Pyelonephritis:

- Out-Patient management includes:
  - Re-hydration orally if tolerated by the patient.
  - Give oral antibiotics such as those given for UTI for 2 weeks.
  - Ask for ultra-sound of the kidney in order to rule out any urinary tract malformation or complications.

Urethritis:

- Give 100 mg doxycycline BID for 2 weeks or
- Azithromycin 1 gram orally as a single dose.

Prostatitis:

- Give analgesics.
- Warm sitz baths.
- Antibiotics:
  - Cotrimexazole 960 mg BID for six weeks or
  - Tetracyclin 250 – 500 mg QID for six weeks or
  - Ciprofloxacin 500 g BID for six weeks.

Special Situations:

Urinary tract infection in Children:

- Cotrimexazole syrup for 5 – 10 days or

- Amoxicillin 50 mg/kg divided in three doses for 5 – 10 days.

Urinary Tract Infections in pregnancy

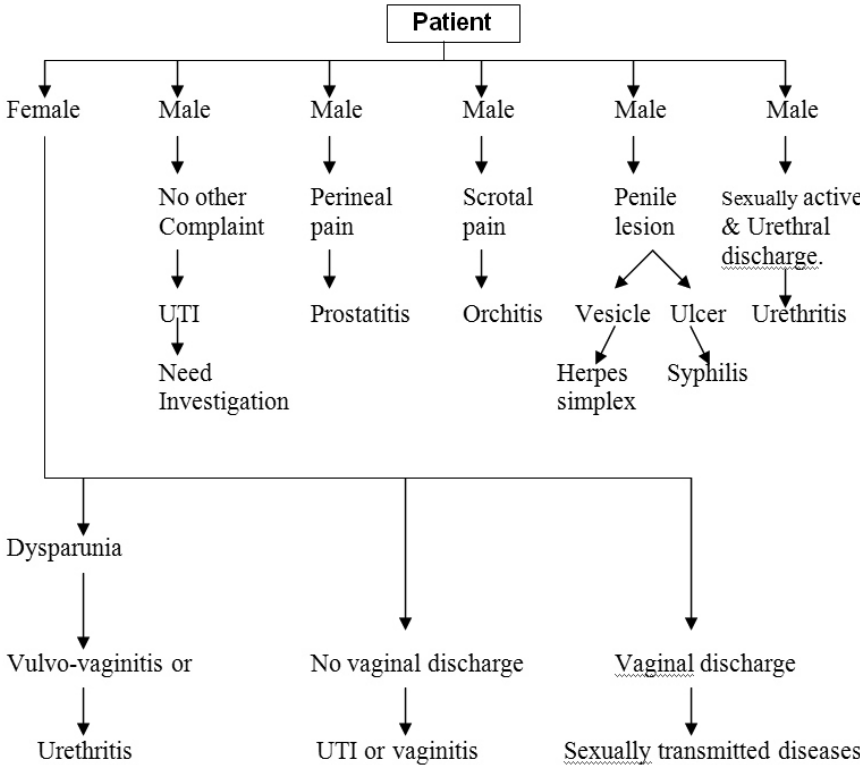
Acute cystitis:

- Amoxicillin 50 mg/kg divided in three doses for 14 days or
- Augmentin 50 mg/kg divided in three doses for 14 days or
- Nitrofurantoin 100 mg BID for 14 days.

Acute peylonephritis:

- Refer to hospital immediately.

Diagnostic Approach to Dysuria



Antenatal Care

Definition: Health care provided to pregnant women before labor.

Objectives:

- To achieve best possible health status of mother and fetus.
- To detect early and manage high risk pregnancies.
- To educate the mother about pregnancy, proper nutrition, alarming symptoms, infant care, breast feeding, and child spacing.
- To reduce maternal and fetal mortality and morbidity.

Diagnosis of Early Pregnancy

A. Symptoms of early pregnancy:

- Missed menstrual period.
- Nausea or vomiting.
- Excess salivation.
- Urinary frequency, especially during the night.
- Engorged breasts
- Fatigue.
- Dizziness.
- Irritability - feeling nervous.
- The woman feels tired and sleepy.

B. Physical Examination for pregnancy

- **General inspection**

  Assess face pigmentation —chloasma-, engorged breasts with secondary areola and increased pigmentation of the nipple. Visible veins on the thorax and the breasts (Hailer's web), Montgomery's corpuscles and secretion of colostrum from the breasts.

- **Abdominal and vaginal examination**

  a. Dark line in the mid-abdomen (Linea Nigra)
  b. Hegar's sign: softening of the cervix
  c. Chadwick's sign: bluish coloring of the vagina and cervix
  d. Increased vaginal discharge

C. Diagnostic Tests

- Test for human chorionic gonadotrophin (HCG) in urine
- Ultrasonography (if available), 6-7 weeks for missed period to detect intrauterine gestational sac, at 7 weeks onward to detect fetal heart.

If pregnancy is confirmed an Antenatal Card should be opened.

First Antenatal Care Visit

During the first Antenatal Care Visit (ANCV) an Antenatal Card should be prepared. The card should include a detailed history of the patient and results of a comprehensive physical examination. The card should then be used to record results of all diagnostic tests and document all findings at every antenatal visit.

Frequency of antenatal visits:

- Every month until the 7th month of pregnancy.
- Every 2 weeks during the eigth month of pregnancy.
- Every week during the last month of pregnancy and at any time when medical care is needed

First Visit (Booking visit)

This is the most important visit

Objectives:

- To start building a trusting relationship. First impressions are often lasting, so the physician must be friendly and approachable.

- To assess the state of health of the mother.
- To identify risk factors by detailed history & careful examination.
- To ascertain base-line recordings of weight, height, blood pressure and haemoglobin level to assess normality and to be used for comparison as pregnancy progresses.
- To give advice on general health matters.

I. History

A. Personal History

Name, age, address, occupation (both parents), duration of marriage, consanguinity, special habits

B. Complaint (its duration and detailed history of the present illness, if any).

C. Menstrual History
   - First day of Last Normal Menstrual Period (LNMP)
   - Calculate Expected Date of Delivery (EDD) by adding 7 days and subtracting 3 months from the next year or adding 7 days and 9 months to the present year.

D. Past Obstetric History
   - Pregnancy, labor, and puerperium of previous pregnancy(ies)
   - Abortion; gestational age, mode of termination and post-abortive period
   - Date of last labor
   - Date of last abortion
   - Mode of delivery
     - Normal delivery
     - Instrumental delivery
     - Cesarean delivery
   - Birth weight (approximately)
   - Mode of infant feeding
   - Family planning methods used, if any.

E. Current Obstetric History

- Symptoms of pregnancy e.g. nausea, vomiting, feeling of sleep
- Symptoms of pre-eclampsia e.g. oedema in lower limbs, headaches
- Quickening: Frequency and first time of fetal movement to be felt

F. Medical and Surgical History

Diseases

- Diabetes mellitus
- Hypertension
- Tuberculosis
- Heart disease
- Epilepsy
- Urinary tract infections (Dysuria, haematuria, etc…)
- Viral infection (Rubella)
- Sexually transmitted diseases
- Post-partum depression

Operations

- Obstetric and gynecological operations, cesarean sections
- Vaginal repair, operations for stress incontinence or repair of fistula, cerclage, D & *C,* myomectomy
- Other surgical operations e.g. hernia, tonsillectomy etc.

Others

- Use of drugs, sensitivities and allergies
- Previous blood transfusion
- X-ray exposure
- Rh incompatibility
- Diet, exercise, weight gain in last pregnancies

G. Family history

- Diabetes mellitus
- Hypertension
- Multiple pregnancies
- Congenital anomalies

- Family support systems, involvement of the husband and family

H. Immunization status for tetanus toxoid

II. Physical Examination

A. General Examination

- Weight
- Height
- Gait and bone deformity
- Pulse and blood pressure
- Nutritional status (pallor, skin manifestations of nutritional deficiency)
- Edema of lower limbs
- Heart and chest examination
- Breast examination
- Thyroid examination

B. Local examination

Inspection

- Size of the abdomen
- Contour of the abdomen
- Scars of previous operations
- Signs of pregnancy
- Fetal movements
- Varicose veins
- Hernial orifices and back

Palpation

- Fundal level
- Fundal grip
- Umbilical grip
- First and second pelvic grips

Auscultation of Fetal Heart Sounds

- 10 weeks by Doppler
- 20 weeks by Pinard's

Assessing Fetal Well Being

Fetal health can be assessed by the following methods:

1. Check the weight of the mother during every antenatal visit. Little or no weight gain indicates fetal jeopardy. (The maintenance of accurate records is important).

2. Assess the fetal size (Fundal level) on every antenatal visit to monitor fetal growth. It is extremely important to keep a record for every pregnant woman.

3. Fetal kick count: it is a simple method for the assessment of the fetal well being, in the third trimester. The patient is asked to count the numbers of perceived fetal movements from 9 a.m. until 9 p.m. or 10 fetal movements whatever may be the first. Normally 10 or more fetal movements should be perceived during the 12-hour period of observation: If less than 10 movements are perceived it indicates fetal jeopardy and the patient should be referred to the hospital for further assessment of fetal wellbeing

4. Fetal movements: absence of fetal movements usually precedes fetal death during the last 48 hours.

5. Auscultation of fetal heart sound.

6. Sonar

III. Diagnostic Procedures

A. Blood analysis for:
- Complete blood count (CBC)
- Group (ABO) and type (Rh)
- Blood glucose level
- Toxoplasmosis: IgG and 1gM

- Serology for rubella and hepatitis-B

B. Complete urine analysis
C. Stool analysis for ova and crysts
D. Ultrasonography

Periodic Antenatal Care Visits

I. History

- Ask about new complaints: bleeding, discharge, urinary symptoms and edema
- Assess previous complaints
- Ask about fetal movements

II. Physical Examination

A. General
- Weight
- Blood pressure
- Edema of lower limbs

B. Abdomen
- Fundal level
- Fetal lie (after 20th week)
- Fetal presentation (after 20th week)
- Fetal Heart Sounds

C. Lab tests
- Hemoglobin level
- Urine analysis for albumin and glucose

Health Instructions during pregnancy

1. **Exercise:** Mild exercise preferably walking should be advised.

2. **Sleep & Rest:** 8 hours at night and 2 hours in the afternoon.

3. **Clothes:** Should be loose, avoid high heels.

4. **Baths:** Showers are preferred over to bath-tub.

5. **Teeth:** Regular cleaning. Consult the dentist for any complaint.

6. **Care of the Breast:**
   - Wash daily.
   - Massage the nipples with a mixture of glycerin and alcohol to reduce cracking.
   - Pregnant mothers with retracted nipple should withdraw them with the thumb and finger using a lubricant

7. **Sexual intercourse:** is allowed with moderation. It should be avoided completely, if there is tendency to abortion or premature labor.

8 **Minimize coffee & tea, no smoking**

9. **Traveling:** only comfortable traveling is allowed .Traveling should be avoided in the last month of pregnancy and it is completely prohibited if the client has a history of abortion or premature labor.

10. **Weight gain:** The average weight gain during normal pregnancy is between 10-12 kilograms. The fetus accounts for approximately one third of this weight gain or 3500 gms. The placenta, amniotic fluid and uterus accounts for 650-900 gms. Increased interstitial fluid and blood volume add 1200-1800 gms. Breast enlargement contributes to at least 400 gms. The remaining weight gains represent maternal fat.
    Excessive weight gain may indicate occult edema of pre-eclampsia. On the other hand failure to gain weight during pregnancy may indicate fetal jeopardy.

Evaluation of Risk Factors for Antenatal Care and Labour

Risk Factors for Evaluations	During ANC		During Delivery	
	ANC At Unit	ANC At Hospital	Delivery At Unit	Delivery At Hospital
1. Personal Factors	√		√	
• Age less than 18 years old	√		√	√
• Age more than 35 years old	√			√
• Long duration of marriage with infertility & ovulatory drugs	√			√
• Severe malnutrition	√			√
2. Obstetric History				√
• If all previous pregnancies have ended in abortions		√		√
• Parity ≥5 (greater than 20 weeks gestation)	√			√
• No spacing	√			√
• Previous Intra-uterine fetal death or neonatal death	√	√		√
• Previous small baby for gestational age	√	√		√
• Previous fetal malformation	√	√		√
• Previous spontaneous 2nd trimester abortion or preterm	√	√		√
• Previous low birth weight	√	√		√
• Previous 1st trimester abortion	√	√		√
• Previous hypertensive disorders during pregnancy	√	√	√	√
• Previous Rh-Isoimmunization or hydrops fetalis		√		√
• Duration of labour ≤ 4 hrs		√		√

Risk Factors for Evaluations	During ANC		During Delivery	
	ANC At Unit	**ANC At Hospital**	**Delivery At Unit**	**Delivery At Hospital**
• Previous instrumental delivery (vacuum or forceps)	√	√		√
• Previous cesarean delivery		√		√
3. Past History		√		√
• Hypertension		√		√
• Heart disease or heart murmurs	√	√		√
• TB or antituberculous drugs				√
• Epilepsy or antiepileptic drugs		√		√
• Chronic illnesses		√		√
• Uterine malformations including fibroid or other pelvic masses		√		√
• Previous cerclage	√			√
• Previous myomectomy or uterine scars		√		√
• Previous successful classical repair of fistula	√			√
• Previous blood transfusion	√		√	√
4. Family History	√		√	
• Fetal abnormality	√		√	
• Twin or multiple pregnancy	√		√	
• Hypertension	√		√	
• Diabetes				
5. Current Situation Affecting Pregnancy				
• Gait "Limping"	√	√		√

Risk Factors for Evaluations	**During ANC**		**During Delivery**	
	ANC At Unit	**ANC At Hospital**	**Delivery At Unit**	**Delivery At Hospital**
• Color "Jaundice"		√		√
• Excessive weight gain during pregnancy >2 kgms 1st trimester >7 kgms 2nd trimester >4 kgms 3rd trimester				√
• Maternal height <150 cm	√			√
• Poor weight gain during pregnancy (8 kgms)		√		√
• Marked varicose veins of lower limbs	√			√
• Not immune against tetanus	√			√
• Hyperemesis gravidorum		√		√
• Absent fetal movements		√		√
• Marked changes in frequency or intensity of fetal movements		√		√
• Hypertension ≥140/90		√		√
• Vaginal bleeding in early pregnancy		√		√
• Smaller uterine size than gestational age		√		√
• Larger uterine size than gestational age		√		√
• Premature contractions		√		√
• 3rd trimester vaginal bleeding		√		√
• Severe anemia (Hb <9gm%)		√		√
• Proteinuria > + 1		√		√
• Glucosuria > + 1		√		√

Risk Factors for Evaluations	During ANC		During Delivery	
	ANC At Unit	ANC At Hospital	Delivery At Unit	Delivery At Hospital
• Bacteriuria > 100,000 in urine culture		√		√
• Herpes		√		√
• Non-engagement of head at 40 weeks in primigravida		√		√
• Syphilis		√		√
• HIV/AIDS		√		√

Remember:

- Accurate Record Keeping is indispensable for:
  - Work Plan of Maternal Clinics
  - Work Plan of Woman's Health
  - Assessment of Fetal Well-being
- Educate the mother in every visit
- Avoid unnecessary drugs during pregnancy
- Routine supplementation of folic acid and iron after 1st Trimester:
  - Calcium Tablets (1 tab. daily (500-600 mg) + 2 glasses of milk (300 mg in each glass)
  - Iron Tablets (1-2 tabs. daily of Ferrous Fumerate or Ferrous Gluconate
- Identification of the immunization status against tetanus is important

Breast Mass

Definition:

Any area of the breast that has three dimensional feeling which is different from the surrounding breast tissue.

Differential Diagnosis:

1. Fibrocystic changes
2. Breast cancer
3. Fibroadenomas
4. Mastitis

Epidemiology:

- Benign breast conditions affect almost all women.
- Breast cancer affects one out of every eight women.
- Prevalence in USA is 27 per 100,000; 44000 females die per year
- Breast cancer is the second most common cause of cancer death Internationally
- Breast cancer causes 20% of cancer deaths in women and the incidence is increasing
- Only 1% of all breast cancer occurs in men.
- In Saudi Arabia, the benign fibroadenoma was the most common breast lesion followed by ductal carcinoma. The mean age for malignant lesions observed in seven different studies was 44.18 years. In the Kingdom of Saudi Arabia breast cancer constitutes 18% of all cancers in Saudi women. Whilst locally advanced breast cancer disease is unusual in Western countries, it constitutes more than 40% of all non-metastatic breast cancers in KSA.

1. Fibrocystic changes

- Most common benign condition

- Incidence increases with age:
  - 25% of pre-menopausal women
  - 75% of post-menopausal women

2. Breast cancer

- Affects 1:8 of women
- Risk factors

a. Age:

- Increases with age
- One in 9 women who live upto 80 years of age will develop breast cancer
- 75% occur in older than 50 years of age
- 2% occur under 30 years of age

b**. Genetic background**:

- Women whose mother or sisters had breast cancer are 2-3 times more prone to have cancer
- Risk increases if relatives have breast cancer before menopause or in both breasts.

c. Hormonal factors *(increase estrogen exposure)*

- Early menarche
- Late menopause
- Null parity
- First pregnancy after 30 years of age
- Early oophorectomy

N.B. Oral contraceptives and hormone replacement therapy DO NOT increase risk

3. Fibroadenomas:

- Rarely seen post-menopausally.
- Most prevalent in women under 25 years of age.
- Most prevalent in black women.

4. Mastitis:

- Almost always associated with lactation.

Role of Family Physician

Although, breast conditions and diseases are common:

- But only 10-% of breast masses are discovered by the physician.
- The role of family physician includes:
  - Being competent to take accurate history and to perform physical examination of the breasts.
  - Being able to differentiate between benign and medically significant complaints or findings.
  - To be able to utilize available office procedures for evaluation of breast lesions.
  - To reassure patients with benign disorders.
  - To counsel patients regarding preventive strategies and risk factors for breast cancer.
  - To educate patients on the method and management of breast feeding.

Interviewing

Aims:

- To establish rapport.
- To rule out serious conditions.
- To reassure if benign condition.
- To guide management and to take proper action.

Biodemographic data

- Name, age, job, number of children.
- Pregnant/breast feeding

Presenting Complaints

Breast lump: In 80% of cancer cases, the only symptom is lump which is detected by the patient.

Breast pain: Most common symptom of fibro-cystic changes.

Nipple discharge: Second most frequent symptom of cancer

The character of the discharge cannot be used to distinguish benign and malignant.

The following cases with nipple discharge need more concern:

If age older than 50 years

Associated with mass

Blood or serous discharge

History of present illness:

For any Complaint, you need to specify the following to help in diagnosis:

- Onset (duration)
- Site of complaint
- Change in complaint overtime
- Relation to menstrual cycle

Discharge: The patients with 3% of breast complaints, under 60 years: 7% cancer patients over the age of 60 years, and 32% cancer-intraductal report to the clinic with the problem of discharge.

Location: Unilateral /bilateral

Color: clear, serous, milky, bloody, green:

Bilateral milky discharge suggests endocrine etiology.

Pathological discharges are usually unilateral and confined to one duct.

Presence of blood increases the chance of malignancy.

Expressed or spontaneous: spontaneous discharge more common with pathologic discharge.

Lactation/ breast feeding.

***Pain (mastalgia)*: might indicate**

Fibrocystic breast diseases

Cancer (cyclical mastalgia) 7-17% of cancer.

Costo-chondritis

Trauma

Mastitis

Mass: Clarify the following:

Duration

Change in size
Fluctuation with menstrual cycle

Associated symptoms
Fever: mastitis
Weight change: cancer
Complaint or masses in other sites

Menstrual /reproductive history*: explore the health status and risk factors*

- ***Menarche*** - age at onset
- ***Menopause*** - symptoms
- ***Parity***
- ***Age of 1st term pregnancy product***
- **Pregnancy:** - current status
- ***Breast feeding***
- ***Breast self exam***

Risk factors for cancer (see epidemiology of breast cancer)

Impact on patient:

- Patient might stop breast feeding or forced to do so
- Breast mass may affect patients daily activities and relationships

Past medical history:

- Breast surgery: date, name, etc.
- Breast Biopsies: date, result of biopsies
- Breast masses: description
- Other surgical procedure: describe it properly
- Medical problems:
- Chronic disease: Diabete mellitus, Hypertension.

Family History:

- Cancer: Breast, ovarian, endometrial, colon
  Degree of Consanguinity to patient

Drug History:

- Over the counter (side effects)
- Contraceptives:
  - Cost
  - Side effects
  - Type
  - Compliance
  - Hormonal therapy
  - Phenothiazines, antihypertensive.

Life Style:

- Use of alcohol
- Smoking
- Caffeine intake
- Exercise

Psychosocial:

Idea: Patient beliefs about the condition

- She might think it is just a trivial and simple thing
- She may think that it is a serious disease e.g. cancer
- Other beliefs.

Concern of the patient

- Patient may think it is a cancer
- She might think no body will take care of her kids when she is under treatment
- Other concerns

Expectation:

- She might expect you to
- Reassure her
- Do some investigations
- Refer her to a well known breast surgeon
- To give her a sick leave
- Other expectations

Effect:

- **At work**: Frequent absenteeism

- **Home:** Her relationship with her husband and family might be affected due to the problem itself or indirectly due to the psychological impact. Relationship with her child (lactation)
- **Socially:** The effect on the relationships with people in the community:
  - Friends
  - Relative
  - Others

Depression and anxiety: screen them using the standard for each; criteria, when indicated.

Stress: Check sources of stress at Job and at home.
Check methods used by patient to control stress.

Support system: Support from relative, family, people at work, agencies, or other.

Hidden agenda: You have to explore any hidden agenda e.g. the patient may think a lot about the cancer while she has only minor problem.

Physical Examination

Aim:

- To determine the diagnosis
- To reassure the patient and the health provider

General:

- Observation
- Vital signs, height and weight

Breast examination

- Upright and supine positions
- Inspect breast with patient upright for:
  - Retraction
  - Dimpling

- Asymmetry
- Erythema
- Palpate breast and axillary tissue:
  In supine position: Palpate breasts in concentric circles
  In upright position**:** Palpate breast with patients hands on hips or behind the head
- Palpate nipple for discharge.
- Ask patient to locate mass if palpable to the patient.
- Lymph nodes:
- Axillary
- Supraclavicular
- Infraclavicular
- Document all breast physical findings for proper follow up and legal purposes

Mass:

- Consistency: Firm, hard, soft
- Mobility: Fixed, mobile
  - Margins: Well circumscribed /Irregular
  - Skin changes: Color
    Ulcerations
    Crusting
    Pea d'orange
  - Size: in centimeters
  - Location: Quadrant (draw it)

Nipple Discharge

- Nipple description:
  - Inversion
  - Ulcerations
- Character of discharge
  - Color
  - Bleeding
- Location of discharge
- Unilateral/bilateral
- Number of ducts involved
- Occult bleeding
- Sample for cytology (Limited usefulness)

Lymph Nodes: Describe them in detail like masses

Management

Clarification:

- Nature and *prognosis* of the condition (depend on the diagnosis)
- Explain available *treatment* for the condition

Reassurance:

Reassure your patient if the condition is benign and reassure her that she will get the best available services, if diagnosis is serious

Advise:

Good care of lactating breast

Self breast examination: insufficient evidence with or against self breast examination. You need to treat your patient individually because if you advise her unnecessary you may make her more anxious without any benefit.

Invistigations:

Cytology of discharge or needle aspiration

Ultrasound: to evaluate the mass

Mamography- 75-90%, senstive in differentiating between benign and malignant

Biopsy if indicated:

1. Equifocal cytologic findings on aspiration
2. Bloody cyst fluid
3. Failure of mass to disappear completely after aspiration
4. Bloody nipple discharge
5. Nipple excoriation (Paget's disease of breast)
6. Skin edema and erythema suggestive of inflammatory breast carcinoma.

Prescribing:

Fibrocystic changes:

- Supportive measures
  - Wearing tight cloth

    - Well padded bra
- Dietary changes
    - Decrease caffeine intake
    - Vitamin. E
- Drug
    - Danazol: for breast pain, 100-400 mg/day.75% response rate but has high incidence of side effects
- Surgery

Breast cancer:

- Surgery
- Chemotherapy
- Hormonal therapy
- Radiation therapy

Fibroadenoma:

- Surgical excision

Mastitis:

- Continue nursing
- Dicloxacillin 500 mg P.O. Q6h x 10 days
- Local heat
- Incision: If no response within 48 hours (abscess)

Referral:

Conditions that need referral to breast surgeon

- ***Urgent***:
    - Discrete lump and age > 35 years old.
    - Definite signs of cancer e.g. ulceration, skin nodule skin distortion
- ***Lump:***
    - New discreet lump
    - Breast abscess
    - Recurrent cyst
- ***Pain:***
    - If associated with a lump
    - Intractable pain
- ***Discharge***:
    - Blood stained discharge
    - Single duct discharge
    - All women > 50 years

- ***Change in skin contour***
- ***Family history of breast cancer***
- ***If you have doubt***

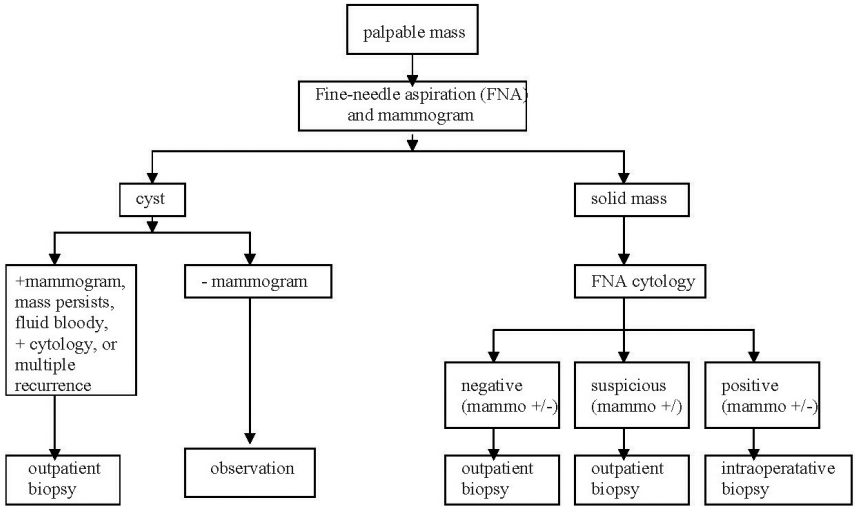
Observation (Follow-up)

- According to the condition

Prevention

1. Screening Recommendation (USPSTF)
   - *Mammography* at age: 50-69 years: annually
     age >70 years: -Unclear when to stop screening may be reasonable to be more than 2 to 3 years in women older than 70years as these tumors are Estrogen Receptor-positive and slow growing.
2. A*moxifine prophylaxis*: May be useful in some high risk groups.

Diagnostic evaluation



Vaginal Bleeding

Definition:

Abnormal vaginal bleeding is the one which occurs at an inappropriate time (<21 or >36 days).

It is either due to anatomic pathology or dysfunctional.

It can be in the setting of a normal or an abnormal ovulatory cycles.

Normal vaginal bleeding occurs in the absence of implantation of fertilized ovum due to estrogen and progesterone fall as a result of regression of corpus luteum with 9-11 days of ovulation. Normal cycle ranges from 23-39 days (mean 29 days) menses lasts for 2-7 days while most of the bleeding occurs in the first few days.

Presence of clots or duration of bleeding in excess of one week is considered abnormal.

Prevalence:

About 20% of women will experience abnormal vaginal bleeding at one stage or the other of their lives.

It can be differentiated into ovulatory, anovulatory, postmenopausal and pregnancy related.

Differential Diagnosis

Ovulatory Bleeding

1. Normal variant

2. Anatomic lesion
   a. Uterine fibroids

b. Cervical disease (inflammation, polyp, cancer)
c. Endometrial carcinoma
d. Pelvic inflammatory disease
e. Intrauterine device

3. Concurrent disease
   a. Bleeding diathesis
   b. Foreign body

Anovulatory Bleeding

1. Hypothalamic dysfunction
   a. Puberty
   b. Perimenopausal state
   c. Situational stress, excessive exercise, weight loss
   d. Excess androgen, prolactin, cortisol, hypothyroidism
   e. Polycystic ovarian syndrome

2. Oral contraceptive use
   a. Inadequate estrogen dose

Postmenopausal Bleeding

1. Endometrial pathology
   a. Fibroid
   b. Cancer
   c. Polyp

2. Cervical pathology
   a. Cancer
   b. Polyp
   c. Erosion

3. Vaginal pathology
   a. Atrophic vaginitis

Pregnancy:

1. Ectopic pregnancy.
2. Post-abortion (retained products of gestation).
3. Abortion.
4. Ante-partum hemorrhage

Interviewing

Detailed menstrual history:

- Compare current bleeding pattern with it.
- Age is important – puberty (pre-menstrual irregular bleeding & functional).
- Child bearing age – exclude pregnancy related bleeding
- Presence of amenorrhea.
- Amount of bleeding.
- Post-menopausal.
- Associated pain, discharge.
- Dyspareunia, postcoital bleeding.
- Pelvic pain, fever.
- Intrauterine contraceptive device.
- Hirsutism, verilization, cushinoid appearance.
- Goitre, dry skin, coarse hair.
- Check for signs of bleeding diathesis (petechie, ecchymoses, splenic enlargement).

Past medical history:

- Bleeding disorders
- Anaemia
- Fibroidectomy, cancer

Family history:

- Cancer
- Vaginal bleeding

Drug history:

- Hormonal therapy
- Oral contraception

Lifestyle:

- Smoking
- Alcohol
- Diet

Psychosocial:

- Anxiety, depression
- Patient expectations, fears

Ideas:

- Patient's belief about the cause of bleeding

Concern:

- Serious disease, abortion, ectopic pregnancy
- Fear of cancer
- Marriage and its-effect
- Menopause (post-menopausal bleeding)

Expectations:

- Pregnancy – wanted or unwanted – planned or unplanned
- Functional or organic cause

Effect on:

- Sexual life, marriage and pregnancy
- Work, reaction

Support system:

- Family
- Husband
- Mother

Hidden agenda:

- Malignancy
- Marriage
- Sexual life

Physical examination

Aim:

- Differentiate between ovulatory and anovulatory bleeding
- Anatomic pathology or dysfunctional
- Pelvic masses

Examine patient for signs of intravascular volume depletion, bimanual examination for pelvic masses, uterine, cervical masses

- Examine for signs of pregnancy
- Vital signs (pulse, blood pressure, weight and pallor, chronic cause of bleeding such as uterine adenomyosis
- Fever, pelvic tenderness may suggest pelvic inflammatory disease
- Thyroid (Goitre)
- Dry skin, coarse hair (hypothyroidism)
- Hirsutism, verilization (polycsytic ovarian disease)
- Cushinoid appearance (Cushing syndrome)
- Organomegally (heamatologic disorders)

Management

Clarification:

- Explain nature of normal & causes of abnormal bleeding.
- Explain most probable cause at this given age.
- Prevalence is common, as 20% of women will have bleeding at certain time in their ages.

Reassure:

- About cause
- Nature of the condition
- Therapy & management plans

Advice:

- Patient is advised according to the type of bleeding and the cause involved.
- Contraceptive use - oral or IUCD
- Excessive bleeding – immediate consultation or referral to hospital

Investigations:

- Pregnancy test
- Complete blood count
- Urea and creatinine, platelet count
- Pelvic ultrasound
- Cervical smear (pap smear)
- Cervical culture
- Follicle and Leutinizing Hormones (FSH&LH)
- Hydroxy progesterome
- Fasting blood glucose

Prescribing:

Depending on cause

Acute anovulatory bleeding:

- To stop bleeding (oral medroxyprogesterone (provera 10 mg/day for 10 days or single intramuscular injection of progesterone of 100 mg.
- Referral is indicated if bleeding does not stop with in 2-days.

Chronic anovulatory bleeding

- Monthly administration of progesterone (10 mg/day for 10 days).
- Estrogen-progesterone (oral contraceptive pills) for those who do not desire pregnancy.

Perimenstrual bleeding:

- Rule out structural lesion.
- Prescribe progesterone as above.

Referral:

- Heavy bleeding.
- Ectopic pregnancy.
- Recent abortion (missed placental tissue).
- Any woman with pelvic mass.
- Perimenopausal and post menopausal bleeding.
- Positive pap smear.

- Age >40.
- Postcoital bleeding.
- Antepartum hemorrhage.
- Failed medical treatment

Bronchial Asthma

Definition:

A disease of the airway manifested by recurrent or persistent inflammatory,hypersecretion and obstructive process, secondary to multi-factorial stimuli and may eventuate to irreversible loss of lung function and major disability.

Epidemiology:

- Internationally affects 5% of population. In Saudi Arabia it affects 15% of population. In some studies, the reported prevalence reached 25% of Saudi population. It occurs before 5 years of age in 75-90% of cases.Peak prevalence occurs between 10-12 years old.
- The prevalence of bronchial asthma has increased during the last two decades.
- Asthma is second to acute respiratory infections as a cause of pediatric admissions and illness-related school absenteeism.

Pathogenesis:

- Chronic inflammatory condition resulting in airway obstruction and airway hyper-responsiveness to various stimuli.
- Asthma may be precipitated by:
  - Sinusitis
  - Gastro-esophageal reflux
  - Upper respiratory tract infection
  - Exercise
  - Post-nasal drip
  - Exposure to tobacco smoke
- Bronchial asthma changes overtime.

Classification

1. *Extrinsic*: Immunologically mediated, tends to occur in childhood.

characterized by:
-Elevated IgE and Esinophilia.
-Senstivity to inhaled allergens.
-Causes about 25% of cases,and contribute to another 25%.
-Frequently seasonal.
-Early asthmatic response is mast cell dependent and result in acute bronchoconstriction.
-Late asthmatic response is an inflammtory reaction that leads to a prolonged airway responsiveness.

2. *Intrinsic*: - Non-immunogenic precipitants asthma.
-Associated with exercise and respiratory infections, pharmacologic occupational stress and diet stimuli.
-Associated with environmental pollution .
-No identified cause.
-Worsens with age.

Differential Diagnosis

1. ***Upper airway disorder:***
   - Foreign body aspiration
   - Vocal cord dysfunction
   - Upper airway mass
   - Tracheal narrowing
   - Tracheomalacia
   - Airway edema (angioedema)
2. ***Lower airway disorder***:
   - Chronic obstructive pulmonary disease ***(COPD)***
   - Bronchectasis
   - Bronchiolitis
   - Pneumonia

3 . Gastrointestinal: Gastro esophageal reflux ***(GERD***)

4 . Drugs: ACE inhibitors
Beta blockers

***5. Cardiac*:** Congestive heart failure (Cardiac Asthma)

6. Psychiatric disorder: Conversion disorder
Emotional laryngeal wheezing

Interviewing

Aim:

- To confirm diagnosis
- To assess severity
- To assess control
- To guide management

Bio-demographic data:

Name,sex

Age- Before 2 years, It is difficult to differentiate between bronchial asthma and bronchiolitis.

Job: Some jobs has risk of developing asthma or trigger it e.g. working in a factory or farms.

Chief complaints

- Wheezing, dyspnea and coughing: are common
- Cough only: cough variant asthma (cough is the only patient's symptom
- Sputum production

Symptoms characteristics

- Duration of symptoms
- Frequency of symptoms – each for how many days/night.
- Baseline peak flow meter – Per week or month
- Aggravation by exercise, hot, or cold weather.
- Seasonal changes

Severity - admission to intensive care unit(ICU)
- admission to General Ward
- visit to emergency room(ER)

- **Risk factors**
  - Family history of allergy
  - Environment e.g. contact with animals, smoking
  - Triggers: Dust, animals (Fur/feathers), change in weather exercise, house-dust mite, pollen, viral infections, stressor, solvents

- **Systems involved:** *you need to screen these systems*
  - Respiratory system
  - Cardiovascular system
  - Gastrointestinal system

Impact: Bronchial asthma can affect patients themselves and their families in all dimensions e.g.
- Absence from school/work.
- Not participating in exercises.
- Avoid traveling away from his/her home.

Complication:
- Chest wall deformity
- Lung dysfunction
- Death

Past medical history:
- Previous admissions .frequency, place, course, etc.
- Frequency of ER admissions, Intensive care unit, intubations

Medical problems:
- Gastro-esophageal reflux
- Chronic disease
  - Coronary heart disease
  - Diabetes Mellitus
  - Hypertension
- Allergy-allergic rhinitis, allergic conjunctivitis, eczema etc.

Family History:

- Similar problem (asthma)
- Other allergic problems: sinusitis, rhinitis…

Drug history:

Prescribed

Types
- Bronchodilators
- Inhaler steroids
- Oral/I.V. steroids
- Oxygen

Dose:
Compliance:
Side effects:

Over the counter:

- Non-steroidal anti-inflamatory drugs (NSAIDs)

Abuse

- Steroid
- Other, if appropriate

Lifestyle:

- **Smoking:** * Type:
  - Cigarette
  - Cigar
  - Sheesha
  * Frequency
  - Duration
  - Is there a plan to quit?

- **Exercise** * Type
  - Limitations not to practice exercise

- **Hobbies** e.g. contact with animals
- **Alcohol**: (CAGE questionnaire, if appropriate)

Psychosocial

Idea: Patients or parents might think it is just a cold or they might think it is infectious, etc.

Concern: Patients or parents might worry that:

- This disease will affect all the sibling
- Patients will be addicted to medications

Expectation:

Patients or parents may expect from the physician:

- To reassure them that they will recover
- To do some investigation e.g. Chest X-ray
- To refer to a specialized centre

Effect:

Bronchial asthma is a chronic disease which can affect all the family members.

Child: Absenteeism from school
Avoid playing with peers

Father: Absence from work
Anxiety for his child and other siblings

Mother: Take care of chronic disease, it is stressing in all dimensions.

Expensive drugs

Depression, Anxiety, stress: Screen for depression, anxiety and stress on the patient and also on the family members.

- **Support system:**

At home: Who is taking care of the child?

- House keeper
- Relatives
- Mother

Community: Who does help the patient and their families socially and financially?

- **Hidden Agenda**: Patients or their family might have a hidden concern which is needed to be explored e.g.
  - Asthma is contagious
  - Patient might be dependent on asthma medications throughout the life
  - Other (individualize your patient)

Physical Examination

Explain to your patient what and why do you want to conduct physical examination.

Aim:

- To maintain doctor-patient reltationship
- To narrow the spectrum of diagnosis.
- To guide management.

General:

- Patient looking (well/ill), able to complete full sentence, use of accessory muscles.
- Pulse, Respiratory rate, temperature, blood pressure
- Weight & height (you need it to measure flow rate)
- Peak expiratory flow-meter (PEFR), oxygen saturation

Skin:

- Eczema
- Dermatitis (cutaneous evidence of atopy)
- Subcutaneous emphysema

Head, Eye, Ear, Nose & Throat (HEENT):

- Nasal polyps
- Congestion
- Pharyngeal cobble stoning

Lungs:

- Retraction, hyper expansion of thorax
- Wheezing, rhonchi
- Decrease breath sounds

- Poor expiratory effort (prolonged expiratory phase)
- If airflow is very slow or wheezing absent (dangerous sign)

Cardiac:

- S_3 (3rd heart sound)
- Elevated JVP:congestive heart failure(cardiac asthma)
- Prominent P2 (pulmonary hypertension)
- Right ventricular heave (pulmonary hypertension)

Extremities:

- Pedal edema (congestive heart failure)

Using inhaler and peak flow-meters:

- Ask your patients to use them in front of you to ensure that they are using them properly.

At the end of your examination, explain your findings to your patient.

Management

Clarify the following to the patient (don't forget to speak to the child if he or she is the patient)

- The Diagnosis
  - Severity
  - Prevalence in the community
  - Available treatment
  - Expected complications
  - Importance of compliance to treatment
- You need to deal with patient and parents concerns
- Agree with patient on an action plan especially in emergency situation.
- Reassure the patient and his parents that symptoms can be controlled.

Advice:

- The patient to avoid triggers and to use salbutamol, 20 minutes before exercise, if it is associated with exercise.

- Advise the child to participate with his/her peers.

Investigations:

Aim: To guide treatment

Pulmonary Function Test (PFT)

- Establish diagnosis
- **Obstructive pattern**:

  Decreased expiratory flow rates

  Reduction in FEV_1 and a proportionally smaller reduction in FVC with a ratio of $\frac{FEV_1}{} < 0.75$

  FVC

  Reversible obstruction: FEV_1 increase of 12% after bronchodilator therapy.

  Provocative challenge (histamine or methacholine) increase sensitivity

PEFR:

Record initially, after stabilization, following initial of treatment, and annually.

Routine checks: Patient should check PEFR each morning and more frequently with dyspnea, if PEFR drops 50% from baseline, obtain medical assistance.

Consider: CBC, CXR (if needed to rule out other diagnoses or complications) ABG: *Normal*: pH: 7.4,PCO_2:40,PO_2: 98

Mild Asthma: pH: 7.48,PCO_2:30,PO_2: 60 (acute Respiratory alkalosis)

Severe asthma: pH: 7.40,PCO_2:40,PO_2: 55 (respiratory alkalosis and metabolic acidosis,normal pH, fatigue patient)

Classification of asthma severity in individuals older than 5 years:

Mild intermittent

- Symptoms less ≤ 2 times per week.

- Night symptoms ≤ 2 times per month.
- asymptomatic with normal PEFR between exacerbations,
- exacerbations brief (1 hour to some days),
- intensity of exacerbations varies.
- Peak flow variability(<20%)

Mild persistent

- symptoms greater than 2 times per week but less than 1 time per day;
- exacerbations may affect activity; nocturnal symptom greater than 2 times per month.
- Peak flow variability(20-30%)

Moderate persistent

- Symptoms occur daily .
- Night symptoms > one night per week.
- PEFR between 60-80% of expected.,
- Peak flow variability(>30%)

Severe persistent

- continual symptoms.
- limited physical activity.
- frequent exacerbations,
- frequent nocturnal symptoms.
- PEFR< 60% .

Classification of asthma severity in individuals younger than 5 years:

Mild intermittent

- Symptoms less ≤ 2 times per week.
- Night symptoms ≤ 2 times per month.
- Peak flow variability(<20%)

Mild persistent

- symptoms occur more than 2 times per week but less than 1 time per day;

- night symptom occur more than twice per month.

Moderate persistent

- Symptoms occur daily .
- Night symptoms > one night per week.

Severe persistent

- continual symptoms.
- frequent nocturnal symptoms.

Treatment

- ***Goals***:
  - To control symptoms.
  - To maintain normal activity levels.
  - To normalize pulmonary functions.
  - To optimize pharmacotherapy with minimal side effects.
  - To meet expected standards of medical care.
- ***Education***:
  - Teach patients to recognize exacerbations and appropriate home use of medications for prevention and treatment of flares.
  - Ensure proper use of inhalers, peak flow meters; spacer for inhaler use.
- ***Environmental control***
  - Identify allergen exposures
  - Assess sensitivity to seasonal allergens.
- ***Smoking cessation***
- For both patient and household members.
- ***Vaccination***
  - Influenza annually.
  - Pneumovax (see Vaccination section)

Drugs:

1. Beta-2 agonists: Delivered by metered dose inhaler (MDI) or nebulizer

   Promote bronchodilation

2. Ipratropium Bromide: Delivered by nebulizer or MDI
   Dry up bronchial secretions
   Effect of beta-agonist and ipratropium bromide is addictive

3. Steroids: Reduce inflammation
   Delivered by MDI for asthma prevention
   Oral or I.V.for acute exacerbation

4. Preventive medications: Leukotrine modifires such as zafirlukast
   Mast cell stabilizer such as cromolyn

5. Methylxanthines: Theophylline; no longer regularly used due to narrow therapeutic window and frequency of side effects

Mild Intermittent

- **Quick relief** – Albuterol 2 puffs q 4 to 6 hours PRN.
- **Long-**term control – No daily medication needed.

Mild Persistent

- ***Quick relief***: Albuterol 2 puffs q 4 to 6 hours PRN

- ***Long-term control***: (one daily medication)
  - Anti-Inflammatory agent – Low-dose inhaled corticosteroid
  - Fluticasone 44 mcg/puff 1 to 3 puffs bid, or 110 mcg/puff 1puff bid.
  - Triamcinoione acetonide 2 to puffs bid, up to 10 puffs total per day
  - Beclomethasone diproplonate 42 mcg/puff 2 to 4 puffs bid/tid, up to 12 puffs per day.
  - Theophylline 300 to 800 mg qd (serum concentration of 5 to 15 mcg/ml)
  - Montelukas 10 mg PO q hs(pediatric dose 5mg if older than 6 years

Moderate Persistent

- ***Quick relief***:
  - Albuterol 2 puffs q 4 to 6 hours prn

- ***Long-term control***

  One or more of the following:

  Anti-inflammatory agent – Medium-dose inhaled corticosteroid, fluticasone 110 mcg/puff 1 to 3 puffs bid

  Long-acting β_2-agonist - Salmeterol/Serevent ® 2 puffs qd/bid

  Oral medication (if needed) – Theophylline 300 to 800 mg qd (serum concentration of 5 to 15 mcg/ml), montelukast 10 mg PO q hours

Severe Persistent

- ***Quick relief:***

  Albuterol 2 puffs q 4 to 6 hours PRN

- ***Long-term control*** –

  May require all of the following:

  Anti-inflammatory agent –high-dose inhaled corticosteroid, fluticasone 110 mcg/puff 3 to 4 puffs bid, 220 mcg/puff 1 to 2 puff bid

  Long-acting β_2-agonist – salmeterol 2 puffs qd/bid

  Oral medication – theophylline 300 to 800 mg qd (serum concentration of 5 to 15 mcg/ml), montelukas/ Singulair ® 10 mg PO q hours daily prednisone

Acute Exacerbation

Assess severity:

Cough, breathlessness, wheeze, chest tightness, accessory muscle use, suprasternal retractions, PEFR < 50% personal best or predicted, suggests severe exacerbation.

Initiate treatment: The mainstay of therapy is oxygen and beta agonist nebulizers

Inhaled short-acting β_2-agonist (MDI 2 to 4 puffs at 20 mins intervals three times OR three nebulizer treatments)

Good response: Suggests mild exacerbation, PEFR > 80% predicted or personal best, no wheezing or dyspnea; response to β_2-agonist sustained for four hours; may continue β_2-agonist every 3 to 4 hours for 24 to 28 hours, if already on an inhaled corticosteroid, double dose for 7 to 10 days; follow-up with clinician.

Incomplete response: Suggests moderate exacerbation; PEFR 50-80% predicted, persistent wheezing or dyspnea:

- Add oral corticosteroid
- Continue β_2-agonist immediately
- Admission.

Poor response: suggests severe exacerbation; PEFR < 50% predicted, marked wheezing and dyspnea

- Add oral corticosteroid
- Repeat β_2-agonist immediately
- If severe distress, admit.

- Patients at high risk for asthma-related death should receive immediate clinical attention, after initial treatment more intensive therapy may be required
- Oral steroid dosages: Adult: 40-60 mgs single or 2 divided doses for 3-10 days

  Child: 1-2 mg/kg/day, maximum 60 mg/day, for 3-10 days

Points to Remember:

During a severe exacerbation, wheezing may not be present.

Exercise – Induced asthma usually begin within 3 minutes of the completion of the exercise and peaks in 10-15 minutes.

Most effective medications for controlling long-term outcomes in children are inhaled corticosteroids.

NO benefit to adding antibiotics for acute asthma exacerbation (unless there is a clear indication).

With severe asthma exacerbation, the $PaCO_2$ returns to normal and is a marker for possible impending respiratory failure.

Referral:

Pulmonologist: Inadequate control or progressive symptoms.

Diabetes Mellitus

Definition:

Diabetes Mellitus (DM) is a group of heterogeneous metabolic disorders which characterized by abnormal metabolism of glucose due to defect in either insulin secretion or insulin action or both.

Types of Diabetes Mellitus:

- Type 1.
- Type 2.
- Gestational Diabetes Mellitus (GDM).
- Others.

In type 1 diabetes, there is an absolute deficiency of insulin due to destruction of pancreatic β-cells by viral infections or autoimmune diseases.

In type 2 diabetes, there is a relative deficiency of insulin secretion "inadequate secretion or ineffective insulin action" due to peripheral resistance to insulin.

Type 2 diabetes is frequently associated with lipid abnormality such as low high density lipoprotein (HDL), high Triglycerides and cholesterol.

The third type of diabetes mellitus occurs among females during pregnancy. This type is known as gestational diabetes mellitus.

Epidemiology:

- The prevalence of diabetes differs from one country to another .In USA it is estimated to be 2% - 4% while in Saudi Arabia it is found to be about 24%.
- For every diagnosed case of diabetes, there is one undetected case.

- Gestational diabetes affects 1-3% of pregnant mothers.
- Type 2 diabetes represents 95% of the total cases of diagnosed diabetes.
- Type 2 diabetes affects adults particularly those above 45 years of age.

Uncommon Causes of Diabetes:

- Pancreatic disorders.
- Hemochromatosis.
- Pheochromocytoma.
- Acromegaly.
- Drugs (Steroids, contraceptive pills, hydrochlorothiazide).

Diagnosis of Diabetes:

Diagnosis of diabetes depends on presence of symptoms and measuring the level of blood sugar.

Symptoms of diabetes:

- Polyuria (excessive urination).
- Nocturia (excessive urination during night).
- Polydipsia (thirst).
- Polyphagia (hunger)
- Weight loss.
- Visual disturbance (blurring of vision).
- Acute abdomen, nausea, vomiting (Diabetes Keto-Acidosis).
- Fatigue, recurrent vaginal fungal infection, burning of feet.
- Confusion in severe hyperosmolar hyperglycemia.

Laboratory investigation:

Diabetes is diagnosed if one of the following is fulfilled.

- Fasting Plasma Glucose (FPG) ≥126 mg/dl (7≥ mmol/L) on two separate occasions.
- Random Plasma Glucose (RPG) ≥200 mg/dl (11.1 mmol/L) on two separate occasions.

- Symptom of diabetes plus (RPG) ≥200 mg/dl or (FPG) ≥126 mg/dl on one occasion.

Diagnosis of diabetes by using 75gms of glucose (Glucose Tolerance Test (GTT):

	FPG (mmol/L	Plasma Glucose (mmol/L) after 2 hours
Normal	< 5.5	<7.7
Impaired glucose tolerance test	5.5-6.9	7-11.1
Diabetes Mellitus	≥7	>11.1

Screening of Diabetes:

Screening of diabetes is recommended to the following individuals:

- Age >45 years old with body mass index (BMI) >25 kg/m^2
- Age <45 if he/she has one of the following additional risk factors:
  - Physically inactive
  - First degree relative with diabetes.
  - Female delivered a baby of ≥ 4.5 kgs.
  - Female with previous history of gestational diabetes.
  - Hypertensive patient.
  - High Density Lipoprotein (HDL) <35 mg/dl and or TG >250 mg/dl.
  - Polycystic ovarian disease.
  - History of previous impaired glucose tolerance test.
  - History of vascular diseases.

Management of Diabetes

Goals for the management of diabetes:

- To identify risk factors for Coronary heart diseases and the complications of DM.

- To achieve good control of:
  - Hyperglycemia (65-126 mg/dl) or postprandial glucose < 180 mg/dl..
  - HbA1C < 7%.
  - Blood pressure < 130/80 mmHg.
  - Cholesterol < 200 mg/dl.
  - LDL < 100 mg/dl; if patient had CHD(LDL< 70 mg/dl).
  - HDL > 40 mg/dl.
  - BMI < 25 kg//m^2.
  - No proteinuria.
- To improve quality of life among diabetics. (Free of symptoms, no complications).

Steps of diabetes management:

- Confirm diagnosis.
- Classify the disease (type1 or type 2).
- Break bad news to the newly diagnosed diabetics
- Provide adequate health education regarding the following:
  - What is diabetes?
  - Causes and risk factors of diabetes.
  - Symptoms and signs of diabetes.
  - Role of diet in the management of diabetes.
  - Acute and chronic complications of diabetes.
  - Role of drugs and their side effects.
  - Importance of adherence to diet, exercise, drug and weight loss.
  - Importance of regular follow-up.
  - Importance of self care such as foot care and glucose self monitoring.
  - Importance of regular periodic annual examinations.

Assess the patient for coronary heart diseases risk factors:

- Age and sex.
- Hypertension.
- Hyperlipidemia.
- Obesity and overweight.
- Physical inactivity.
- Smoking.

Assess the patient for the following complications of diabetes:

- Peripheral vascular disease.
- Peripheral neuropathy.
- Retinopathy.
- Nephropathy.
- Ischemic heart disease.
- Diabetic foot.
- Diabetes Ketoacidosis.
- Growth retardation in children.
- Skin infections.

Use holistic comprehensive approach:

- Social.
- Psychological.
- Behavioural.
- Spiritual.
- Preventive.
- Continuous and comprehensive.

How to achieve the goals of diabetes management?

Diet therapy and exercise:

- They are the cornerstone for the management of diabetes
- Their effect appears within 1-4 weeks
- If they did not control hyperglycemia within 3-6 month, start anti-diabetic agent .

Dietary Therapy:

Objectives of diet therapy for diabetics:

- Maintenance of near-normal:
  - Glucose.
  - Blood Pressure.
  - Lipid.
  - Weight.
- Provision of adequate calories.
- Reducing acute symptoms of hyper and hypoglycemia.
- Reducing the long-term complications.

Components of diabetic diet therapy:

- Protein: 10-20% of total calories. If diabetic nephropathy develops keep to 0.6-0.8. gram/ kg.
- Fat: 30%: Saturated fat 10%, polyunsaturated fat 20%.
- Carbohydrate (50-60%) of the total calories.
- Sodium < 3 gram/day, to be reduced to <2 grams if patient suffers from hypertension.

Principles of diabetic diet therapy:

- Explain to the patients the importance of diet therapy
  - Content (Glycemic index)
  - Distribution of carbohydrates, fat and protein.
  - Timing of meals.
  - Special diabetic food.
  - Keeping weight within normal limit BMI (20-< 25).

- Follow the healthy dietary pyramid:
- 6 -11 servings of bread, cereal, rice and pasta groups
- 2-4 servings of fruits and vegetable groups
- 2-3 servings of meat, poultry, fish, eggs, milk, yoghurt, cheese group.

  Note:
  - 300 ml of milk → one serving
  - 200 gram of yogurt → one serving
  - 60-100 gram of cooked lean meat or poultry or fish → one serving
  - 1 cup of raw leafy vegetables → one serving
  - ½ cup cooked vegetable → one serving
  - one apple, banana, orange, ¼ melon → each is one serving

Note:
- 300 ml of milk → one serving
- 200 gram of yogurt → one serving

- 60-100 gram of cooked lean meat or poultry or fish → one serving
- 1 cup of raw leafy vegetables → one serving
- ½ cup cooked vegetable → one serving
- one apple, banana, orange, ¼ melon → each is one serving

- Eat low glycemic index foods (i.e. apple, peach, pear, banana, yoghurt, low fat milk, brown rice, peanuts).
- Reduce intake of fatty foods.

Exercise Therapy:

- Diabetic patient should spend at least 30 minutes daily walking for five days weekly.
- Diabetic patient can choose the type of activity which is appropriate to his/her life. (walking, swimming, riding bicycles…etc).

Benefit of Exercise in Type 2 diabetes:

- Exercise may increase insulin sensitivity.
- Exercise may improve glucose tolerance.
- Exercise may promote weight loss.
- Exercise may improve lipid profile.
- Exercise may lower blood pressure.
- Exercise may reinforce healthy life styles.

Prescribing exercise should be individualized taking into consideration, the following factors:

- Age >35 years old
- Presence of any coronary heart disease risk factor.
- Presence of micro-vascular disease
- Presence of peripheral vascular diseases.
- Presence of autonomic neuropathy.

Those diabetics with diabetic proliferative retinopathy or overt nephropathy (microalbuminuria > 200 mg/minute) should avoid strenuous exercise while those diabetics with peripheral neuropathy should avoid prolonged walking, treadmill, jogging and step exercise.

Drug therapy of diabetes

Oral Hypoglycemic agents (OHAs) are usually used if diet therapy fail to control diabetes after 3-6 months.

Starting any type of OHAs depends upon the type of diabetes, the severity of hyperglycemia and the associated morbidities.

- Those diabetics who suffer from overweight or obesity are preferred to be started on Metformin if not contraindicated.
- Type 1 diabetics and gestational diabetics should be started on insulin, while gestational DM is started on insulin if diet therapy did not control hyperglycemia.
- Sulfonylureas could be added if the maximum dose of Metformin does not achieve good diabetes control.
- All types of sulfonylureas having the same efficacy. No need to replace them by one to another.
- Long acting sulfonylureas are rarely used due to their side effect(hypoglycemia).

Sulfonylureas:

- They are safe and cost-effective drugs.
- They reduce blood sugar by stimulating β-cells of pancreas to secret insulin.
- They improve insulin sensitivity in peripheral tissues (liver, muscles).
- Initially, they can control blood sugar in 50% of diabetic type 2.
- They reduce HbA1C by 1.5-2%.
- They are effective if there are beta cells in pancreas.
- Every year there is 5-10% failure of treatment.
- The common side effects are: hypoglycemia, weight gain, hyperinsulinemia and allergy.
- They are contraindicated in patients with hepatic or renal failure and pregnancy.

The second generation of sulfonylureas (Glyburide, Glipizide and Glimepiride) have increased potency, more rapid onset, short duration and pancreatic specifity.

- OHAs should be given 15-30 minutes before meals.
- Dose of OHA can be increased every two weeks.
- If the dose of OHA increased to 50% of the maximum without good response, it is unlikely that maximum dose will give good response.

Metformin:

- Metformin acts by inhibiting hepatic glucose production and improving insulin sensitivity.
- Metformin does not stimulate insulin secretion, so it does not cause hypoglycemia or hyper insulinemia.
- Metformin can reduce HbA1C by 1.5 – 2%.
- Metformin can reduce hyperglycemia as mono-therapy in 75-80% of patients.
- Metformin lowers LDL.
- Side effects of Metformin include anorexia, diarrhea, nausea and abdominal discomfort.
- Side effects can be minimized by taking tablets with meals or using low dose in the beginning of therapy.
- Rare side effect is lactic acidosis.
- Metformin is contraindicated in patients with (renal diseases, liver diseases, heart diseases, respiratory insufficiency and pregnancy).
- Starting dose of Metformin is (500 mg twice daily).
- Dose of Metformin can be doubled after two weeks.
- The maximum daily dose of Metformin is 2550 mg, divided into three doses.

Acarbose & Miglitol:

- Acarbose and Miglitol are alpha-glucosidase inhibitors.
- Both act by inhibiting alpha-glucosidase action in the intestines.

- So, carbohydrate will not break down to monosaccharides. Thus postparandial blood sugar in diabetics is decreased.
- They can be used as a second line monotherapy when Sulfonylureas or Metformin has not led to adequate glycemic control.
- They can be used with sulfonylureas.
- Both reduce HbA1C by 0.6-1%.
- Acarbose decrease TG but no effect on LDL or HDL.
- Side effects of alpha glucosidase inhibitors include diarrhoea, flatulence, abdominal bloating and cramping.
- Side effects are reversible when drugs are discontinued.
- Side effects could be minimized by decreasing the starting dose.
- Both drugs do not cause weight gain or hypoglycemia
- Both drugs could be good choices for elderly because they do not cause hypoglycemia.
- Staring dose of both drugs is 25 mg TID with each meal.
- The maximum daily dose is 100 mg TID
- The maximum dose could be reached within 8-12 weeks.
- Both drugs are contraindicated in patients with inflammatory bowel disease, colon ulcer, intestinal obstruction, kidney failure, liver cirrhosis and pregnancy.

Thiazolidinediones:

In this group there are three agents for treatment of type 2 diabetes (Troglitazone, Rosiglitazone and Pioglitazone).

- They appear to act by enhancing insulin sensitivity in muscles and liver.
- Due to the risk of injury to liver, it is essential to monitor liver enzymes initially and monthly in the first year of therapy and quarterly after that.
- They are contraindicated in patients with liver diseases.
- Liver enzyme should be measured if the patient developed symptoms of liver dysfunction (nausea, vomiting, abdominal pain, fatigue, loss of appetite and jaundice).
- They should be discontinued if patient develops these symptoms and high liver enzymes.

- They can raise LDL and lower TG.
- Troglitazone could cause fluid retention and volume expansion causing edema in 5%.
- They should be used carefully in patients with congestive heart failure.
- The initial dose of Rosiglitazone is 2-4 mg daily.
- Rosiglitazone could be used with or without food.
- Rosiglitazone could be increased to 8 mg daily if no response after 12 weeks of treatment in divided or single dose.
- Pioglitazone may be initially taken at 15 or 30 mg once daily without any regard to meals.
- If no response to this initial dose, dose can be increased to 45 mg daily.

Repaglinide *(Prandin):*

- Repaglinide could be used as monotherapy or in a combination therapy with Metformin.
- It acts by stimulating beta-cells to secret insulin.
- It is rapidly absorbed from gastrointestinal tract which leads to fast action.
- It is 3-5 times more potent to stimulate pancreatic Beta-cells to secret insulin than sulfonylureas.
- It does not stimulate pancreas in the absence of glucose.
- It reduces HbA1C by 1.5-2%.
- Attacks of hypoglycemia occur less frequently than that seen among sulfonylurea users.
- It can cause modest weight gain (an average 2.5 kgs.).
- Due to short duration of action and rapid onset, Repaglinide should be used as multiple doses.
- Repaglinide should be used before each meal.
- Recommended stating dose 1-2 mg taken 15 minutes before meal, while the maximum dose is 4 mg used before meals (not more than four meals daily).
- If patient skips meal, he/she should not take the tablet.
- Repaglinide should be used with caution in patient with liver dysfunction.

Insulin:

- Insulin is not the first line of therapy in type – 2 diabetes, but could be used as the first line therapy if there is severe hyperglycemia (Fasting Plasma Glucose > 250 mg/dl) in order to control hyperglycemia early.
- Over-time, about 50% of patients with type 2 diabetes will need insulin to control hyperglycemia.
- Insulin is indicated as monotherapy if sulfonylureas fail to control hyperglycemia.
- Insulin decrease blood sugar by reducing hepatic glucose production and increasing glucose uptake and metabolism by the peripheral tissues.
- Insulin lowers TG.
- Side effects of insulin include hypoglycemia and weight gain (5-10kgs).

Types of insulin

There are five types of insulin:

- **Lispro:**
  - Starts its effect within 15 minutes.
  - Peak of action occurs within one hour.
  - Duration of action: 2 – 3 hours.

- **Short acting insulin (regular):**
  - Starts action after 30 minutes.
  - Reaches its peak of action within 1-3 hours.
  - Duration of action: 5 -6 hours.

- **Intermediate insulin (NPH, Lente)**
  - Starts its action after 2-3 hours.
  - Peak of action occurs within 4-6 hours
  - Duration of action: 12-14 hours.

- **Long acting insulin (ultra-lente).**
  - Its action lasts 18 – 24 hours.
  - Slow sustained release of insulin.

- **Insulin glargine (Lantus):**
  - Start action within four hours.
  - Duration of action 24 hours.
  - No peak activity.
  - Used as daily single dose.
  - Could be prescribed for patients on short acting insulin or patients on anti-diabetic agents who did not reach good metabolic control.
  - It should not be mixed with any other type of insulin.

Rules of insulin use:

- Insulin starting dose – 0.2 – 0.5 unit/kg/day.
- Apply rule of two-third:
  - Two-third of the total dose should be given before breakfast.
  - Two-third of the total dose should be of intermediate (NPH).
- Insulin should be given subcutaneous.
- Diabetic patient can use 70/30 or 50/50 mixed insulin.
- Diabetic patient should be educated regarding self-injection and management of hypoglycemia.

Management of diabetes complications

Tight glycemic control will reduce the incidence of nephropathy, neuropathy and retinopathy.
In order to prevent complications of diabetes, it is essential to do periodic screening for morbidities associated with diabetes such as hypertension, obesity and hyperlipidemia and to treat these morbidities accordingly.

How to prevent diabetes complications?

a. Keep a good glycemic control (FPG <126 mg/dl).
b. Good control of the associated morbidities:

- Hypertension → BP < 130/80.
- Obesity → BMI < 25 kg/m^2 .

- Hyperlipidemia → LDL (70-100 mg/dl.
  HDL > 40 mg/dl.
  TG < 200 mg/dl.
  Cholesterol < 200 mg/dl.

c. Use ACE inhibitors if urine albumin is positive.
d. Consider using of Aspirin 75-325 mg/day.

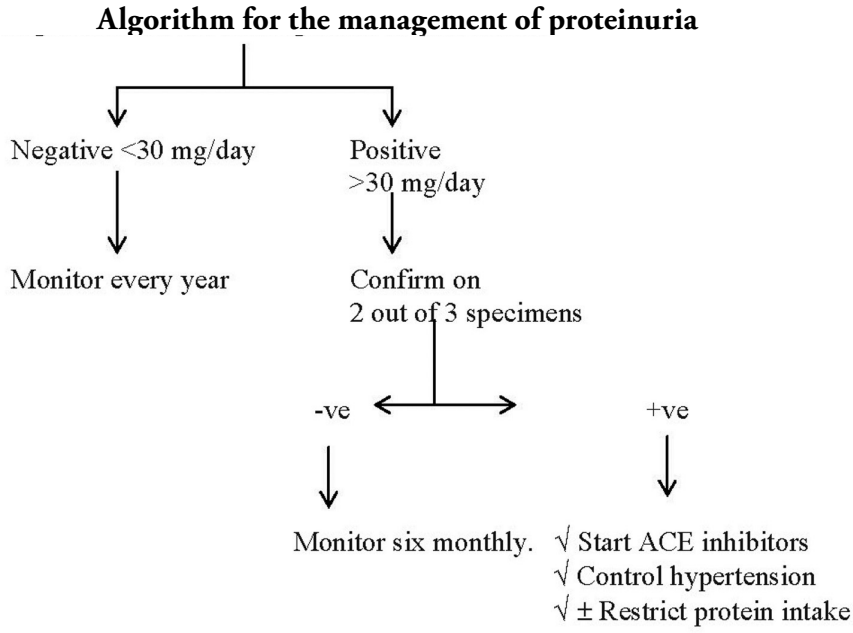
Diabetic Neuropathy (DN):

Diabetic neuropathy presents in 50% of patients who had type 2 diabetes for ≥15 years.

- Tight control of DM is very essential to reduce peripheral diabetic neuropathy.
- Regular foot examination for sensory impairment is essential to detect early diabetic neuropathy.
- Painful neuropathy may be difficult to treat.
- If painful neuropathy does not improve with tight glycemic control, low dose of tricyclic anti-depressants is often helpful.
- Carbamazepin and Gabapentin may be effective treatment but not approved by (FDA) as yet.

Diabetic Nephropathy

- Early screening for microalbuminuria (30-300 mg/24h) is important by spot urine test.
- Presence of microalbuminuria makes it mandatory to have tight control of diabetes and hypertension and addition of ACE inhibitors.
- If urinary albumin ≥300 mg/day, patient should lower intake of protein to 0.8 gram/kg/day



Diabetic Retinopathy

Progress and development of diabetic retinopathy will be delayed if the blood sugar as well as blood pressure are adequately controlled. The proteinuria has been associated with retinopathy.

- Annual fundoscopy is recommended for all type-2 DM patients.
- Laser photo coagulation surgery has been proved to be effective for reducing the risk of progressive visual loss in patients with diabetic retinopathy, but can't reverse established visual impairment.

Psycho-social aspect of diabetes

Diabetes has many negative effects on psycho-social status of individuals such as:

- Effect of shock of diagnosis (bad news).
- Effect of symptoms on daily activities (school, sleep, driving, working).
- Effect of complications of disease (blindness, end stage renal failure).

- Effect of drugs, their side effects and their compliance. (hypoglycemia)
- Effect on sexual activity (impotence).
- Effect on social and family activities (visiting relatives).
- Effect of hypoglycemia (frequent attacks and admissions to hospitals)
- Worry (about getting married, children, job, school/ education, vacation, trip, sudden death, personal appearance, complications).
- Chronicity of the disease.

Quality of life in Diabetics

Life of diabetics may be affected by diabetes, because diabetes affects all the dimensions of the individual life.

- Physical dimension (Mobility, self-care and ability to do daily activities).
- Psychological dimension (Anger, stress and depression).
- Social dimension (Sexual functioning, family relationship, recreational activities).
- Cognitive dimension (memory).

Referral of diabetics to Hospitals:

Diabetics should be referred to hospitals in the following situations:

- New case of type 1 diabetes.
- Gestational diabetes.
- Diabetes Keto-acidosis.
- Hyperosmolar hyperglycemia.
- Diabetics who develop complications.
- Diabetics for annual check up.
- Suspected case of secondary causes.

Annual check up:

Diabetics should be assessed annually as following:

- Body mass index.

- Cardiovascular & neurological examination.
- Feet examination including peripheral pulse and sensations.
- Fundoscopy.
- Urea and creatinine.
- Lipid profile.
- ECG.
- Urine for protein.
- Revising drugs list .

Follow up of diabetics should include al the following components:

- Explore and ask patients about any complaint, concern, idea and hidden agenda.
- Side effects of drugs.
- Assess compliance with drugs, diet, excercise and self-monitoring.
- Asesse for depression, stress, anxiety, sexual activity.
- Measure weight.
- Measure blood pressure.
- Check blood glucose.
- Check feet of patient.
- Educate the patient according to his/her need.

Suggested Form for Diabetic Care

Name: _____ **Date of Birth:** _____ **Sex:**___ **Marital Status:**____

Educational level: _____**Occupation:**_____ **Family Health Record No:**_____

History of Smoking: No ( ) Ex-smoker Yes ( ) Number of daily cigarettes (__)

Home telephone No:----------,----------,----------

Date of DM diagnosis: _____/_____/ **Type of DM: (type 2) (type 1)**

Methods of diagnosis:

1- By screening ( ) 2- Accidentally ( ) 3- By symptoms & signs ( )

Associated Health Problems				
Problem	Date of Onset	Current Status	Treatment	Remarks

History of drug Allergy (no) (yes) Type_____

Initial and Annual Clinical Evaluation

Date	Wt	Ht	BMI	BP	Pulse	FBS RBS	Urine sugar	Urine protein	Urine ketone	Foot exam	Clinical Exam
Date	Cr	Urea	TC	TG	LDL	HDL	ECG	Eye Exam			

Checklist of Diabetic Health Education

Date	What is DM	Diet Therapy	Exercise	Importance of Control	Foot care	Risk of Smoking	Drug use

Drug Therapy

date	drug	dose	frequency	route	duration	Signature of treating doctor

Hypertension

Definition:

Blood pressure is distributed continuously in a population with no real separation between "normotension" and "hypertension". There is also a direct relation between cardio-vascular risk and high blood pressure, the higher the blood pressure, the higher the risk.

The current definition of hypertension is a level of systolic blood pressure of 140 mmHg or above or a level of diastolic blood pressure of 90 mmHg or above. As the blood pressure is quite variable, repeated measurements are required before labeling a patient as hypertensive and deciding to initiate treatment. These repeated measurements could range from several months to several weeks or days depending upon the level of blood pressure or the presence of complications or end organ damage.

Prevalence:

Blood pressure is very common. Various prevalence rates have been reported, may be due to different cut-off points used to study the problem of hypertension. The prevalence also differs due to definition, measurement used and age structure of the population. The prevalence varies between 10% to 25% in adult population. The prevalence may rise up to 50% or higher in population above 50 years of age.

Risk factors:

Non- modifiable risk factors:

- Age - Hypertension increases with age.
- Sex - Hypertension is higher in men than women until menopause thereafter women will also attain almost the same level.
- Family history – Twice as common.
- Race – Blacks have higher prevalence.

- Genetic factors

Modifiable risk factors:

- Dietary habits.
- Obesity.
- Amount of physical exercise.
- Smoking habits.
- Personality of the patient and social environment.
- Insulin resistance (syndrome).

Table 1. Classifications of Blood Pressure according to JNC-VII)

Classification		
Category	SBP(mmHg)	DBP (mmHg)
Normal	<120	And <80
Prehypretension	120 – 139	Or 80 – 89
Stage 1 Hypertension	140 – 159	Or 90 – 99
Stage 2 Hypertension	≥160	Or ≥100

Differential diagnosis:

Primary hypertension - >95% of cases where there is no identification of cause.

Secondary hypertension - (see below)

Classification of hypertension by etiology

A. Essential or primary hypertension

B. Secondary hypertension

1. Induced by exogenous substances or drugs:
   - Hormonal contraceptives
   - Corticosteroids
   - Liquorice and carbenoxolone
   - Sympathomimetics
   - Cocaine
   - Tyramine-containing foods and monoamine-oxidase inhibitors
   - Non-steroidal anti-inflammatory drugs (NSAID)
   - Cyclosporin
   - Erythropoietin

2. Associated with renal disorders:
   - Acute glomerulonephritis
   - Chronic nephritis
   - Chronic pyelonephritis
   - Obstructive nephropathy
   - Polycystic diseases
   - Connective-tissue disease
   - Diabetic nephropathy
   - Hydronephrosis
   - Congenital hypoplastic kidneys
   - Trauma
   - Renovascular hypertension
   - Renin-producing tumours
   - Reno-atrial hypertension
   - Primary sodium retention (Liddle syndrome, Gordon syndrome)

3. Associated with endocrine disorders
   - Acromegaly
   - Hypothyroidism
   - Hypercalcaemia
   - Hyperthyroidism
   - Adrenal
     (i) Cushing syndrome

(ii) Primary aldosteronism
(iii) Congenital adrenal hyperplasia
- Medullary: phaeochromocytoma
- Extra-adrenal chromaffin tumours
- Carcinoid tumours

4. Associated with coarctation of the aorta and aortitis

5. Pregnancy-induced

6. Associated with neurological disorders
   - Increased intracranial pressure:
   - Brain tumour
   - Encephalitis
   - Quadriplegia
   - Guillain-Barre syndrome
   - Respiratory acidosis
   - Sleep apnoea
   - Acute porphyria
   - Lead poisoning
7. Surgically induced
   Pre-operative hypertension

Clinical Evaluation

Aim:

1. Confirm chronic elevation of blood pressure.
2. Assess the overall cardiovascular risk.
3. Evaluate existing organ damage or concomitant disease.
4. Search for possible causes.

Interviewing and history taking

It should provide important information to confirm the previous aims.

1. Assess the risk factors:

- Family history of hypertension and cardiovascular disease

- Family and personal history of hyperlipidaemia
- Family and personal history of diabetes mellitus
- Smoking habits
- Dietary habits
- Obesity
- Physical inactivity
- Personality of the patient; social environment

2. Look for secondary cause of hypertension

- Family history of renal disease (polycstic kidney)
- Renal disease, urinary tract infection, haematuria, analgesic abuse (parenchymal renal disease)
- Drug/substance intake: oral contraceptives, liquorice, carbenoxolone, nasal drops, cocaine, non-steroidal anti-inflammatory drugs (NSAID).
- Episodes of sweating, headache, anxiety (phaeochromocytoma)
- Episodes of muscle weakness and tetany (aldosteronism)

3. Look for Symptoms of end organ damage

- Brain and eyes: headache, vertigo, impaired vision, transient ischaemic attacks, sensory or motor deficit
- Heart: palpitations, chest pain, shortness of breath, swollen ankles
- Kidney: thirst, polyuria, nocturia, haematuria
- Peripheral arteries: cold extremities, intermittent claudication

4. Psycho-social History

Ideas:

- Reaction to being hypertensive
- Patient beliefs about hypertension, complications, side effects of drugs used

Concerns:

- Seriousness of hypertension
- Complications and its effect on his life and work

- Effect on work
- Chronic illness and the chronic use of drugs and their side effects

Expectations:

- Reassurance about prognosis
- Investigations to be done

Effect:

- Work (quality and quantity) sick leaves
- Family – sexual disorders (impotence)
- Social life - reaction

Stress:

- Job – change job, strain
- Financial effects (sick,leaves, complications and its effect on productivity)

Support system: At home, work, friends and community

Hidden: Stigma, handicap, stroke

Physical examination

Aims:

- To confirm elevated hypertension.
- To find out possible signs of organ damage.
- To find out signs suggesting secondary hypertension

Physical examination for secondary hypertension and organ damage

1. Signs suggesting secondary hypertension

- Features of Cushing syndrome
- Skin stigmata of neurofibromatosis (phaeochromocytoma)
- Palpation of enlarged kidneys (polycystic kidney)
- Auscultation of abdominal bruit (reno-vascular hypertension)

- Auscultation of precordial or chest murmurs (aortic coarctation or aortitis)
- Diminished and delayed femoral pulses and reduced femoral blood pressure (aortic coarctation or aortitis)

2. Signs of end organ damage

Brain: murmurs over neck arteries, motor or sensory defects
Retina: fundoscopic abnormalities
Heart: location and characteristics of apical impulse, abnormal cardiac rhythms, gallop, pulmonary rales, dependent oedema
Peripheral arteries: absence, reduction, or asymmetry of pulses, cold extremities, ischaemic skin changes

Investigations

Aims:

To find-out secondary cause or effect of hypertension on end organs.

Laboratory investigations

1. Strongly recommended tests

Urine analysis (dipstick test complemented by urinary sediment examination)
Plasma creatinine
Plasma potassium (sodium is often measured in the same sample)
Blood glucose
Serum cholesterol
Electrocardiogram

2. Additional tests

Fasting plasma triglycerides and high-density lipoprotein-cholesterol
Plasma uric acid
Haemoglobin and haematocrit

Urine culture
Chest X-ray
Echocardiogram

3. **Extended evaluation (domain of the specialist)**
   - Complicated hypertension: tests of cerebral, cardiac and renal functions.
   - Search for secondary causes of hypertension: measurement of renin, angiotensin, aldosterone corticosteroids, catecholamines; aortography and renal arteriography; renal and adrenal ultrasound; computer-assisted tomography (CAT).

Management

Clarification: Explanation

1. General health education measures for patients:
   - Hypertension is a life long disease
   - It is usually asymptomatic
   - Symptoms are unreliable for severity or complications
   - Life style modifications are important
   - Drugs might induce side effects, they should not be stopped unless asked by the physicians to do it
   - Prognosis improves with proper management

2. General measures for physicians

   Management strategy depends on:
   - Level of hypertension (both systolic and diastolic)
   - Age, sex, race
   - Family history
   - Co-existing cardiovascular risk factors
   - End organ damage
   - Co-existing diseases such as diabetes

Reassurance:
- Proper control of hypertension should reduce complications

- Risk stratification

Components of Cardiovascular Risk Stratification in Patients with Hypertension

A. Major Risk Factors

- Smoking
- Dyslipidemia
- Diabetes mellitus
- Age >50 years
- Sex (men and postmenopausal women)
- Family history of cardiovascular disease:
  - Family history of premature cardiovascular disease (first degree relative: male <55 years; female <65 years)

B. Target Organ Damage

Heart diseases

- Left ventricular hypertrophy
- Angina or prior myocardial infarction
- Prior coronary revascularization
- Heart failure

- Stroke or transient ischaemic attack
- Nephropathy
- Peripheral arterial disease
- Retinopathy

Table 2. Risk Stratification and Treatment*

Blood Pressure Stages (mmHg)	Risk Group A (No Risk factors: No TOD/ CCD**)	Risk Group B (At Least 1 Risk Factor, Not Including Diabetes; No TOD/ CCD)***	Risk Group C (TOD/ CCD and/or Diabetes, With or Without Other Risk Factors)

Pre hypertension (130-139/85-89)	Lifestyle modification	Lifestyle modification	Drug therapy+
Stage 1 (140-159/90-99)	Lifestyle modification (up to 12 months)	Lifestyle modification (up to 6 months)	Drug therapy
Stage 2 (>160/100	Drug therapy	Drug therapy	Drug therapy

* *For example, a patient with diabetes and a blood pressure of 142/94mm Hg plus left ventricular hypertrophy may be classified as having stage I hypertension with target organ disease (left ventricular hypertrophy) and with another major risk factor (diabetes). This patient should be categorized as 'Stage 1, Risk Group C, "and recommended for immediate initiation of pharmacologic treatment. Lifestyle modification should be adjunctive therapy for all patients recommended for pharmacologic therapy*
**TOD= Target Organs Damage.
***CCD=Clinical Cardiovascular Diseases.

Advice

Non-pharmacological treatment (life style modification)

1. Loss of weight if overweight
2. Reduce alcohol intake
3. Increase physical activity 30 – 45 minutes on most days of the week
4. Reduce sodium intake to 100 mmol/ equal to 6 g of sodium chloride (2.4 gm sodium)
5. Maintain adequate intake of dietary potassium (90 mmol/d)
6. Maintain adequate intake of dietary calcium and magnesium
7. Stop smoking, reduce fat intake and control of diabetes. These factors are also important to reduce cardiovascular risk factors

Table 3. Lifestyle Modification to Manage Hypertension*+

Modification	**Recommendation**	**Approximate SBP Reduction (Range)**
Weight reduction	Maintain normal body weight (Body Mass Index 18.5-24.9 kg/m^2)	5 – 20 mmHg /10 kg weight loss
Adopt DASH eating plan*	Consume a diet rich in fruit, vegetables, and low fat dairy products with a reduced content of saturated and total fat.	2 – 8 mmHg
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride)	2 – 3 mmHg
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 minutes per day, on most days of the week).	4 – 9 mmHg

Moderation of alcohol consumption if one is involved	Limit consumption to no more than 2 drinks (1 oz or 30 mL ethanol; e.g., 24 oz beer, 10 oz wine, or 3 oz 80- proof whiskey) per day in most men and to no more than 1 drink per day in women and lighter weight persons.	2 – 4 mmHg

*DASH, Dietary Approaches to Stop Hypertension.

Table 4. Prescribing (Pharmacological treatment)

Guidelines for selecting first-line drugs for hypertension

Class of drug	Condition/ indications	Contraindications	Caution/limited value
Diuretics	Heart failure Elderly patients Systolic hypertension Black patients	Gout	Diabetes Hyperlipidaemia Pregnancy Sexually active males
β-Blockers	Angina After myocardial infarct Tachyarrhythmias Pregnancy	Asthma and chronic obstructive pulmonary disease Peripheral vascular disease Heart block	Hypertriglyceridaemia Insulin-dependent Diabetes mellitus Heart failure Athletes and physically active patients Black patients
ACE inhibitors	Heart failure Left ventricular	Pregnancy Bilateral renal artery	Black patients

	hypertrophy	stenosis	
	After myocardial infarct		
	Diabetes with micro-albuminuria		
Calcium antagonists	Angina	Pregnancy	Congestive heart failure
	Peripheral vascular disease		Atrioventricular heart block
	Elderly patients		
	Systolic hypertension		
	Glucose intolerance		
	Black patients		
α-Blockers	Prostatic hypertrophy	Orthostatic	
	Glucose intolerance	hypotension	

Table 5. Oral antihypertensive drugs, single and combination agents

Class	**Drug (Trade Name)**	**Usual Dose Range in mg/ day (Daily Frequency)**
Thiazide diuretics	Hydrochlorothiazide (Microzide, HydroDiuril) Indapamide (Lozol)	12.5 – 50 (1) 1.25-2.5 (1)
Loop diuretics	Furosemide (Lasix)	20 – 80 (2)
Potassium-sparing	Amiloride (Midamor)	5 – 10 (1-2)
Aldosterone receptor blockers	Spironolactone (aldactone)	25 – 50 (1-2)
Beta-blockers	Atenolol (Tenormin) Metoprolol (lopressor) Propranolol (Inderal) Propranolol long-acting (Inderal LA)	25 – 100 (1) 50 – 100 (1-2) 40 – 160 (2) 60 – 180 (1)
Beta-blockers with intrinsic sympathomimetic activity	Acebutolol (Sectral)	200 – 800 (2)
ACE inhibitors	Captopril (Capoten) Enalapril (Vasotec) Lisinopril (Prinivil, Zestril)	25 – 100 (2) 2.5 – 40 (1-2) 10 – 40 (1)
Angiotensin II antagonist	Valsartan (Diovan)	80 – 320 (1)

Calcium channel blockers – Dihydro-pyridines	Amlodipine (Norvasc) Nifedipine long-actig (Adalat CC, Procardia XL)	2.5 – 10 (1) 30 – 60 (1)
Alpha-blockers	Doxazosin (Cardura) Prazosin (Minipress)	1 – 16 (1) 2 – 20 (2-3)
Central alpha2-ago-nists and other cen-trally acting drugs	Clonide (Catapres+) Methyldopa (Aldom-et+)	– 0.8 (2) 250 – 1,000 (2)
Direct vasodilators	Hydralazine (apreso-line+)	25 – 10 (2)

Referral:

Referral is indicated in the following situations:

1. Resistant hypertension
2. Hypertension in children
3. Hypertension with pregnancy
4. Secondary hypertension
5. Hypertension with end organ damage
6. Hypertensive emergency (SBP ≥ 200 or DBP ≥ 120

Follow-up:

Follow-up for control, compliance, complications, quality of life,for other cardio-vascular risk factors and side effects of drugs.

Obesity & Overweight

Definition:

Obesity is a chronic condition characterized by an excess of body fat. It is defined by the body mass index (BMI) wt/ht(m^2) of greater than or equal to 30 kg/m^2 .

According to BMI, weight can be classified into the following categories:

Category	***BMI***
Normal	18.5- 24.9
Overweight	25-29.9
Obesity class I	30-34.9
Obesity class II	35-39.9
Obesity class III	≥ 40

Epidemiology:

The prevalence of overweight in Saudi population is estimated to be 29% in males and 27% in females while the prevalence of obesity is estimated to be 16% and 24% respectively.

Risk factors:

There are many factors predisposing to obesity, they include:

- Overeating.
- Genetics.
- Gender (F > M).
- Lack of physical activity.
- Depression.

- Low socio-economic status.
- Alcoholics.
- Drugs (Tricyclic anti-depressant and steroids)
- Some syndrome (Cushing syndrome, polycystic ovarian syndrome).

Differential diagnosis:

Most of the patients who suffer from obesity either come for health problems such as hypertension, diabetes or detected during clinical evaluation for other complaints such as backache, headache or annual check up. Most of the obesity cases are caused by overeating but secondary cause of generalized or localized obesity should be ruled out. The secondary causes of obesity include:

- Cushing syndrome.
- Hypothyroidism.
- Diseases of hypothalamus.
- Depression.
- Drugs (systemic steroids, tricyclic anti-depressants).
- Localized causes (ascitis, edema), heart failure, liver cirrhosis, nephrotic syndrome

Interviewing

Aims:

- To establish or to maintain good rapport with the patient.
- To know the attitude of the patient regarding management of obesity.
- To guide the management plan.

Socio-demographic data:

Age, sex, marital status, job, income.

Complaint & systemic review:

- Weight gain (duration, onset).
- Any associated symptoms (backache, joint pain, difficulty to move, sleep apnea).
- Menstrual disturbance (endocrine causes).

- Infertility (Polycystic ovarian syndrome).
- Visual disturbance (pituitary adenoma).
- Constipation, cold intolerance (hypothyroidism).
- Dyspnea (causes of edema).
- Night snoring.

Drugs history:

- Systemic steroids.
- Tricyclic anti-depressants.
- Contraceptive pills.
- Phenothiazines.
- Anti-obesity drugs.

Medical & surgical history:

- Past trial to reduce weight (When? How? Results).
- Diabetes.
- Hypertension.
- Asthma.
- Chronic obstructive lung diseases.
- Coronary heart diseases.
- Epilepsy.
- Dyslipidemia.
- Cancers**.**
- Past operations for obesity or another problem.

Family history:

- Obesity.
- Metabolic syndrome.

Life styles:

- Diet (type of food intake, how many meals, contents of meals, eat fast foods).
- Exercise (type, frequency, duration, impact on weight).
- Alcohol (if any).
- Sex (difficult sex position due to obesity).
- Smoking.

Psych-social aspects:

- Idea (what does he/she consider about obesity? Normal, healthy status).
- Concern (why does/ she come now to treat obesity? Does he/she want to be slim).
- Expectation (what does he/she expect to do for them? Prescribe anti-obesity pills).
- Effect of obesity on (sex, work, joint, sleep, fertility).
- Hidden agenda (Does he/she want to discuss sexual dysfunction).

Physical examination

Aims:

- To classify the obesity.
- To rule out the secondary causes of obesity.
- To detect the associated morbidities if any (hypertension, diabetes, etc.).
- To find out the associated complications if any (arthritis, varicose veins, etc).

Vital signs:
Blood pressure, pulse, height, weight, body mass index.

Distribution of obesity:

- Central android obesity which is located in abdomen and upper body; it indicates high risk for diabetes, ischemic heart diseases, hypertension and lipid disorders).
- Peripheral gynoid obesity which is confined to hips and lower extremities.
- Measure the waist circumference (> 102 cm in males and >88 cm in females) are at high risk to develop morbid obesity and its associated morbidities such as coronary heart diseases and sleep apnea.

Signs of secondary causes of obesity:
(Dry skin, buffalo hump, gynecomastia, striae).

Thyroid exam.

Chest & Heart examination:
Cyanosis, bradycardia.

Abdomen:
Organomegally (Fatty liver, hernia).

Limbs:
Edema, varicose veins.

Investigations:
- Complete blood count (associated anemia).
- Blood glucose (associated diabetes).
- Lipid profile (associated dyslipidemia).
- Thyroid function test (if hypothyrodism is suspected).
- Liver and kidney function tests (if history and examination points to clues).

Management

Health education:
- Clarify the diagnosis (primary or secondary obesity).
  -Establish the diagnosis and degree of obesity by calculating BMI
- Discuss with the patient, the benefit of weight reduction.
- Discuss with patient his/ her objectives for weight reduction (e.g.).
  - To reduce the current weight by 2 kgs /month.
  - To prevent further weight gain.
  - To prevent occurrence of co-morbidities.
- Discuss with the patient, the preferred methods for weight reduction (e.g.)
  - Diet therapy (advantages).
  - Exercise (advantages).
  - Drugs (advantages and disadvantages).
  - Surgery (indications, advantages, risks, cost).

- Discuss with the patient, the management of the associated morbidities and complications (if any).

Diet therapy:

Principles of diet therapy:

- The total daily caloric contents of diet should be reduced.
- The total daily fat intake should be reduced (<30% of the total calories).
- The initial calories intake should be reduced by 500 kcal/ day.
- The daily intake of cholesterol should be less than 300 mg/ day.
- Carbohydrate intake should represent ≥ 55 % of the total calories.
- Protein intake should represent ≤ 15% of the total calories.
- Daily fibre intake should be (20-30 grams/day).
- For those patients with BMI ≥ 35, the daily calories should be reduced by 500-1000 calories.
- The target of weight reduction during the next six months should be about 10 kgs of the original weight (i.e. 500 gram /week).

General advices helping obese patients to reduce their weight:

- They should not fill stomach (one-third for food, one-third for drinks and one-third for breath).
- They should take vegetables or fruit before main meals.
- They should not take additional meals or fast meals.
- They should not fill plate with large amount of foods.
- They should eat slowly and grind food well.
- They should avoid diet rich in high fat.
- They should drink a glass of water before meals.
- They should not eat while watching TV or reading.
- They should not eat salty food.

Diet Therapy for obese patient with BMI >30(one day model)

Breakfast *(7 – 8 a.m.)*

- One quarter of bread (slice of bread)
- One cup of tea without sugar
- One egg

Light meal *(10:30 – 11 a.m.)*

- Half a cup of milk of low fat
- One orange or small banana
- Half a cup of fresh juice without sugar

Lunch (2:00 – 3:00 p.m.)

- Piece of meat (100 gram) with no fat.
- Half a cup of rice or macaroni.
- Half a cup of vegetables.
- Salad.
- One small fruit (banana, orange, apple).

Dinner (8:00 – 9:00 pm)

- Half a cup of low fat milk or a cup of tea without sugar.
- One slice of cheese or half a cup of beans.
- Plate of vegetable.
- One banana.

Exercise therapy:

Obese patient should always be prescribed exercise unless contraindicated. The type of exercise should be acceptable, suitable and desirable for patients. Regular moderate exercise will tend to reduce weight by 2.4% of the total body weight. Examples of moderate exercise include:

- Playing volleyball for 45-60 minutes.
- Walking 2 miles in 40 minutes.
- Playing basketball for 30 minutes.
- Bicycling 5 miles in 30 minutes.
- Swimming for 20 minutes.
- Jumping rope for 15 minutes.

Drug therapy:

Drug therapy is indicated if diet and exercise therapy fail to reduce BMI to less than 30 in obese patients without other risk factors (such as hypertension, diabetes, dyslipidemia, sleep apnea and coronary artery diseases) BMI less than 27 in those patients with such risk factors. There are two drugs approved by FDA for weight loss.

These medications can reduce weight by 6-10% of the original body weight.

Sibutramine (Meridia):

Mode of action: Norepinephrine, Dopamine, and Serotonin inhibitors.
Dose: 5, 10, 15 mg per oral daily.
Side effects: Tachycardia and hypertension.

Orlistat (Xenical):

Mode of action: Pancreatic lipase inhibitor (decrease fat abosorption).
Dose: 120mg three times daily before meals.
Side effects: decrease absorption of fat-soluble vitamins (ADEK), soft stool and anal leakage.

Note: if the patient taking either medication has not lost at least 2 kgs on therapy for 4 weeks, the medication should be discontinued.

Surgery:

Indication for surgical therapy:

- Morbid obesity (BMI >40) if medical therapy fails in reducing weight .
- Obesity(BMI>35) with cardiovascular risk factor

- If the obese patients suffer from complications of obesity.

Types of surgical procedures:

- Vertical banded gastro-plasty (average weight loss 17-25%).
- Roux-en gastric bypass (average weight loss 25-40%).

Referral:

Obese patients should be referred if the behavioural and drug therapy fail to reduce weight within six months and if the obesity was morbid or associated with cardiovascular disease risk factors**.**

Suggested Form for Obese Patient

Name: _____ Date of Birth:_____ Sex: ___ Marital Status: ___

Educational level:_____ Occupation:_____ Family Health Record No:____

History of Smoking: No ( ) Ex-smoker Yes ( ) No. of daily cigarettes ( )

Home Telephone No: _____ , _____ , _____

Date of obesity diagnosis: ___/___/ Type of obesity: (android) (gynoid)

Associated health problems				
Problem	Date of Onset	Current Status	Treatment	Remarks

History of Drug Allergy (no) (if yes) Type _____

Brief History of Diet:

Intake of fat meals: very much ( ) Moderate ( ) Low ( )
Intake of Carbohydrate meals: very much ( ) Moderate ( ) Low ( )
Intake of snacks: Frequent ( ) Sometimes ( ) Rare ( ) Never ( )
Intake of Fast Food: Frequent ( ) Sometimes ( ) Rare ( ) Never ( )

Exercise History:

Performing any physical activity (no) or (yes)
Type of activity (if any) _____ weekly, Duration (_____ hours)

Initial clinical Evaluation

Date	Wt	Ht	BMI	BP	Pulse	FBS	TC	TG	Clinical Examination
									Waist Cir = _____ Thyroid gland: _____ Signs of Cushing:_____ Lower Limbs Edema:_____

Checklist of Health Education

Date	What is obesity	Diet Therapy	Exercise Therapy	Importance of ideal body weight and control of aggravating factors	Drug use	Surgical roles

Dyslipidemias

Definition:

Dysilipidemias are metabolic disorders of lipoprotein either due to lipoprotein overproduction or deficiency.

These disorders could be manifested by an elevation of serum cholesterol, low density lipoprotein (LDL), or Triglycerides (TG), or decrease in high density lipoprotein (HDL).

Epidemiology:

Dyslipidemia is one of the most common metabolic disorders in the world. In Saudi Arabia the prevalence of hypercholesterolemia was found to be 18-23%.

The primary causes of dyslipidemia are genetic and high intake of fatty food. The secondary causes are numerous and include:

- Diabetes mellitus
- Hypothyroidism
- Pregnancy
- Nephrotic syndrome
- Obstructive jaundice
- Chronic renal failure
- Anorexia nervosa
- Drugs (oral contraceptive pills, Beta blockers, Diuretics)

Risk factors for Dyslipidemias include: Diabetes mellitus, hypertension, sedentary life, obesity, familial hypercholesterolemia and smoking.

Diagnostic approach to dyslipidemia

Interview:

Dyslipidemias are usually diagnosed during annual check up for chronic diseases such as diabetes, hypertension, obesity or during mass screening of the community.

Sometime, patients come to their physicians and ask them to do lipid profile.

History should include all the following:

Biodata: age, sex, occupation, marital status.

Assess for risk factors of Coronary Artery Diseases (CAD)

- Age and sex: above 45 years for male and 55 years for female.
- Family history of coronary heart diseases (first degree relative less than 60 years old).
- Hypertension (persistent BP> 140/90 or known to have Hypertension on treatment).
- Smokers.
- Diabetes mellitus.

Enquire about past medical, surgical, family and drug history:

- Past medical problems (specify).
- Past surgical operations (specify).
- Family history of familial hypercholesterolemia.
- Nutritional history (types and amounts).
- Social habits (smoking, alcohol).
- Exercise history (type, duration, frequency).
- Drug history (indication, dose, frequency duration, side effects).

Enquire about idea, concern, effect and expectation (ICE)

Clinical Examination:

- Vital signs, weight and BMI.

- General body look (obesity, body mass index).
- Signs of hypercholesterolemia (xanthelasma, tendon xanthoma and corneal arcus).

Laboratory Investigations:

- Fasting serum total Cholesterol (TC > 200 mg/dl).
- Fasting Triglyceride (> 150 mg/dl).
- Low density lipoprotein cholesterol (LDLC > 130 mg/dl).
- High density lipoprotein cholesterol (HDLC < 60 mg/dl).

If any one of the above parameters is found abnormal another lipid profile should be obtained within six weeks to confirm the diagnosis.

Management

The aims of management include the following:

A. Exclude the secondary causes.
B. Assess the severity of hyperlipidemia.
C. Assess the presence of the other risk factors for CAD.
D. Classify the type of dyslipidemia (Fredrickson classification) as shown in Table 1.

Table 1. Fredrickson Classification of Dyslipidemias

Phenotype	TG	TC	Elevated lipoprotein	Atherogenesis
I	High	N or H	Chylomicrons	None
IIa		H	LDL	+++
IIb		H	LDL&VLDL	+++
III		H	IDL	+++
IV		N or H	VLDL	+
V		Nor H	VLDL & Chylomicron	+
LDL= low density lipoprotein, VLDL= very low density lipoprotein, IDL= intermediate Density Lipoprotein, TC=Total Cholesterol,TG= Triglyceride				

E. Classify the degree of CAD risk.

F. Determine the targets for LDL and HDL in accordance with the presence of CAD risks as following:

- Those with current CAD or peripheral vascular diseases, should lower LDL< 100 mg/dl and HDL> 60 mg.
- Those with multiple risk factors for CAD should lower LDL< 130mg/dl and HDL> 35 mg/dl
- Those with low risk factors for CAD should lower LDL< 160 mg/dl and HDL>35mg/dl

G. Choose the appropriate action. (diet and exercise vs. drugs or both).

Exercise Therapy:

All individuals should perform aerobic exercise for thirty minutes daily four times weekly unless there is a contraindication. Walking and swimming are optional types of exercise. Exercise will tend to decrease blood pressure, blood sugar, weight, LDL, TG, and will increase HDL.

Diet Therapy:

The objective of diet therapy is to decrease the LDL level to less than 160 mg/dl for those patients without risk factors and to reduce LDL to less than 130 mg/dl in those patients with two or more risk factors and to less than 100mg/dl for those with confirmed CAD. Diet therapy will reduce LDL and TG within 6-8 weeks and should be continued for six months before giving drug therapy unless there are good indications for initiation of drugs.

Diet therapy should be initiated in patients with LDL (130-150 mg/dl) and with two or more risk factors for CAD and for those with LDL> 160 mg/dl without risk factors. Diet therapy usually reduces LDL by 10-20 %.

Components of Diet Therapy:

- Meat should be less than 100 gram/day (fish, poultry, lamb, beef).
- Restrict egg intake to less than two yolks/week.
- Use low fat dairy products (2-3 servings/day).
- Use unsaturated oils (sunflowers, soy bean, canola, olive, peanut)
- Use breads: six servings/day: whole grain bread, oat, wheat, corn, dry beans, and peas.
- Intake vegetables and fruits (2-4 servings /day) .They should be fresh with no added fat or sugar.
- Intake adequate amount of fibers: 20-30 grams/day.

Pharmacological Therapy:

- Drug therapy is ***indicated*** in the following conditions:
- If the levels of lipid remain elevated after six months of diet therapy (did not reach to the target).
- If the initial LDL> 190 mg/dl..
- If TG > 1000 mg/dl.
- Choice of lipid lowering agent depends on the type of the elevated lipid.

For high LDLC, Statin are the most effective agents while high TG are preferred to be treated by Gemfibrozil or Nicotinic acid (see Table 2).

Table 2. Common drugs used in the management of dyslipidemias

Safety monitoring	***Adverse effects***	***Dose***	***Drug***
Liver function test, and coagulation profile	Gastro-intestinal dysfunction, myositis.	600mg BID	Gemfibrozil
Liver function test, uric acid, blood sugar.	Flushing, hyperglycemia, hyperuricemia	100 mg TID	Nicotinic acid
Creatinine, kinase Liver enzymes	Muscular pain High liver enzymes	10-40 mg at night	Pravastatin
		10-40 mg at night	Atorvastatin
		10-40 mg at night	Simvastatin
		20-80 mg at night	Fluvastatin

Genetic Disorders

Definition:

A disarrangement or abnormality of function caused by the genes.

The Impact on Individual, Family and Community:

Genetic disorders may have a wide range of impact on individual patients, family as a group, other individuals in the family and the community.

As our understanding of human genetics improves over time, the number of illnesses that are associated with increased risk for family members is likely to increase. There is clearly an impact on the family when a family member with a genetic disorder becomes acutely or chronically disabled. The presence of illness in one family member, therefore, affects the role and the responsibilities of others in the family. The caretaking role can also have important effects on family members. When a family member becomes ill, other members of the family may be called upon to assume responsibility for providing support and care. Illness can create a change in the boundaries of family subunits, causing family members to seek other sources of support in the family when one or more family members become ill. The death and dying of a family member with a genetic disorder has a particularly profound impact on families. Therefore, it is essential to think how the genetic disorder of a family member affects the family system and those who are caring for the individual patient. Such a perspective will provide an important cue of when it might be appropriate to begin including the family as an extension of the doctor-patient relationship.

A patient's illness itself affects the community in many ways. Sick patients are generally not productive workers in the economy. Illness can cause disability, which, in turn, have an impact on the financial resources of individuals and families in the communities. Patients with genetic disorders in general are likely to require more health care resources than other patients. It is clear that disability determination

can have a dramatic effect both on the individual patient and on the work environment in the community. Therefore, genetic disorder has a major financial and social impact on the community. Daily involvement with the community makes it easier to think of community issues in caring for individual patients and families.

Contextual care is essential to the formulation of public policy, particularly in the context of genetics, where its impact over the next two decades on the organization of clinical services and on the society is likely to be considerable. Practitioners of health must contribute to this endeavor, remaining aware of the growing importance of genetic mechanisms in disease, and of the potential to utilize the new genetic knowledge for the benefit of individuals, families and community.

Types of Genetic Science:

- Clinical Genetics
- Molecular Genetics
- Population Genetics
- Cytogenetics
- Genetic Counseling
- Pharmacogenetics
- Others

Importance of Genetics for a Family Physician:

Family and primary care physicians have an increasing role to play in diagnosis and management of genetic disorders e.g.:

1. To evaluate the risk, a patient may have
2. To counsel patients about possible risks associated with any future child bearing.

Etiology of Genetic Disorders:

1. Transmission to offspring through carrier parents
2. Mutation in genetic materials due to: spontaneous mutation, infection, teratogenic drug, radiation or diabetes mellitus during pregnancy.

Classification of Genetic Disorders:

1. Single gene disorder (prevalence 0.35%) caused by a mutant at a single genetic locus.

The transmission pattern is divided into:

1. Autosomal dominant e.g. Marfan syndrome
2. Autosomal recessive e.g. Sickle cell trait, cystic fibrosis
3. X-linked dominant e.g. vitamin D-resistant rickets
4. X-linked recessive e.g. Heamophilia A,B, Duchenne Muscular Dystrophy.

2. Chromosomal disorders: (prevalence 0.2%): caused by loss, gain or abnormal arrangement of one or more chromosomes.
   e.g. Down's syndrome, Turner syndrome, Klinefelter syndrome

3. Multifactorial disorders (prevalence 5%): Caused by interactions between genes and environmental factors. They make a very major contribution to chronic illness in adult life (e.g. Diabetes Mellitus, Neural Tube Defects).

4. Acquired somatic genetic disorders: mutation arise in somatic cells and are not inherited (i.e. are not present from conception) e.g. malignancies (breast cancer, colorectal cancer).

5. Mitochondrial disorders: Arise from mutations in the genetic material in mitochondria (Mitochondrial DNA is transmitted only through maternal line).

Genetic Counselling

Definition:

A process of communication and education which addresses concerns relating to the development and/for transmission of hereditary disorder.

Steps:

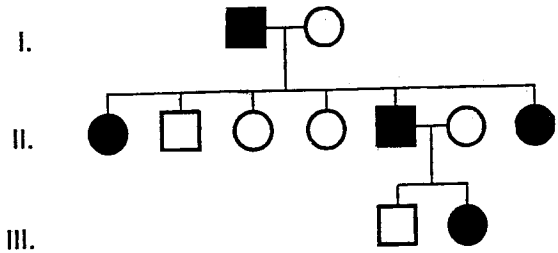
Step 1: Establishing diagnosis:

Based on: history, physical examination and appropriate investigations. Counselling should only be undertaken when facilities exist to ensure that an accurate diagnosis can be made.

Step 2: Inheritance pattern:

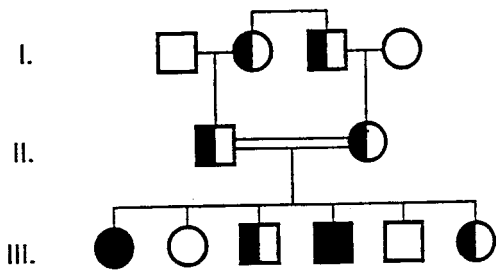
1. Autosomal dominant inheritance.

Recurrence risk: The risk that each child will inherit the mutant gene equals 1 in 2 (50%) i.e. each pregnancy has 50% chance to be affected and 50% to be normal.



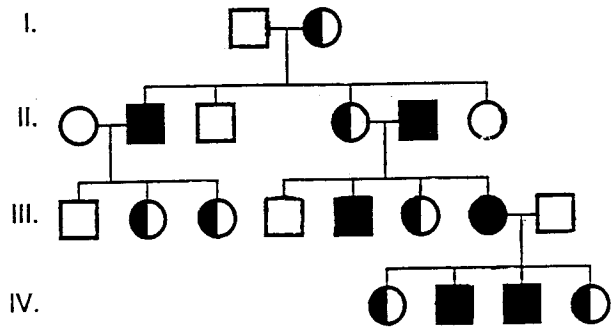
2. Autosomal recessive:

Recurrence risk: the risk that each child will inherit the mutant gene equals 1 and 4 (25%) i.e. Each pregnancy has 25% chance to be affected and 50% to be heterozygotes and 25% will be normal.



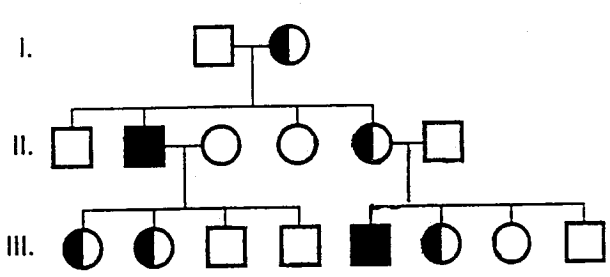
3. X-linked Dominant:

- Affected male transmit the trait to all their daughters but not to their sons.
- Affected heterozygous females transmit the condition to 50% of their children (regardless of sex)
- Affected homozygous females transmit the trait to all their children.



4. X-linked recessive:

- All affected are males
- If the trait transmitted through the heterozygous mother, she is phenotypically normal.
- The trait may represent a new mutations in the affected males
- An affected male never transmits the trait to his sons
- All daughters of an affected male will be carriers
- The carrier female transmits the trait to 50% of her sons



Step 3: Discussing the options

By the steps already provided to patients with all the information necessary for him/her to make decision
All possible and permissible choices should be given to the patient including details of technique; limitations and risks associated with each technique

Step 4: Support

Individual or couple could be extremely upset when they become aware of a genetic diagnosis. Genetic counsellor should take psychological and emotional factor into account and follow proper way in breaking a bad news. As a family physician you should introduce short and long term support to the couple.

Hemoglobinopathies

Definition:

A hematological disorder due to alteration in the genetically determined structure of hemoglobin with clinical characteristics and lab abnormalities.

Normal hemoglobin components:

Hb component	Adult	Newborn
HbA: α2β2	97%	20%
HbA: α2δ2	2.5%	0.5%
HbF: α2γ2	<1%>	80%

Sickle cell disease:

Definition: A chronic hemolytic anemia characterized by sickle shaped RBCs caused by homozygous inheritance of Hbs.

Pathogenesis:

Genetic diseases characterized by the presence of hemoglobin S(Hbs) in RBCs.

Hbs is formed by subsititution of valine for glutamine in the sixth position of *B*- hemoglobin chain.

During high oxygen consumption, Hbs causes red blood cells to sickle.

Distorted RBCs adhere and plug small arterioles and capillaries leading to occlusion and infarction. Sickled RBCs are too fragile.

Hemolysis occurs after the fragile RBCs enter the circulation.

Sickle cell trait: Heterogenous for sickle gene.

Sickle cell diseases: Homogenous for sickle gene

Epidemiology:

- Hematological disorders spread widely throughout Africa, African immigrants, India, Mediterranean and Middle east countries.
- More common in blacks than whites.
- In USA, sickle cell disease found in 0.3 % and trait in 13% of blacks.
- In Bahrain, 1%-2% of neonates have sicker-cell disease and 11% are carriers.

- In Saudi Arabia, frequency depends on the region. In the Eastern Region, 20-30% of Saudi newborns are heterozygous for the sickle gene.

Clinical Manifestations:

1. **Anemia:**
   - Weakness, lassitude, spleenomegaly
   - Low hematocrit
   - High level of Reticks
   - Abnormal skull radiograph

2. **Constitutional symptoms**
   Delayed growth and development due to recurrent infection in childhood
   Non-functional spleen may lead to sepsis due to encapsulated organisms.

3. **Acute crisis:**
   Recurrent pain secondary to vaso-occlusive phenomena usually in:
   - Abdomen: mimic acute abdomen e.g. appendicitis
   - Joints
   - Back
   - Chest

   Chest syndrome: treated as both infection and infarction (it is difficult to differentiate)

4. **End organ damage:**
   - Lungs: pneumonia
   - Heart: heart failure
   - Kidneys: hematuria; renal failure
   - Gut: Abdominal pain
   - Spleen: Spleenic infarction
   - Bone: Limb pain; Bone tenderness; Osteomyelitis

Diagnosis:

- High suspecion in risky people
- Sickle cell test: does not differentiate between sickler and trait

- Blood smear: Howel-Jolly bodies, sicked cells.
- Blood test: Anemia, increased reticks count, increased indirect bilirubin.
- Definitive diagnosis: hemoglobin electrophoresis and demonstration of sickle cell trait in both parents.

Prognosis:

- The life span of homozygous patients increased to more than 50 years.
- Common causes of death are:
- infections
- pulmonary embolisms
- vital organ damages

Management

Clarify the diagnosis and explain the prognosis

Prevention:

- **Immunization:**
  - Pneumococcal
  - Haemophilus influenza
  - Hepatitis B
- **Prophylaxis:**
  - Penicillin till puberty
  - Folate supplementation:
- **Counseling:**
  - Premarital
  - For patient: Avoid dehydration
  - Avoid smoking and alcohol
- **Regular ophthalmologist follow-up**
- **Regular foot care**
- **Analgesics to prevent crisis**

Treatment of acute crisis:

- Regular vigorous analgesics (narcotics)
- Vigorous hydration (PO/IV)
- Oxygen
- Treat infection

- Blood transfusion (if cardiopulmonary symptom and Hb < 5 g/dl)

Action Plan:

- Patient should seek medical help in the following situations
  - Persistent fever
  - Chest pain, shortness of breath or vomiting
  - Prolonged new headache

Admission should be considered in the following situations:

- Signs of lung involvement
- Neurological signs
- Abdominal pain
- Spleenic enlargement
- Hepatic enlargement
- Swollen, painful joints
- Loin pain
- Non-responsive painful crisis
- Congestive heart failure

Thalassemia

Definition:

A heterogeneous of hereditary hemolytic anemia marked by a decreased rate of synthesis of one or more hemoglobin polypeptide chains.

Classification:

According to the chain involved:
- α Thalassemia
- β Thalassemia
- Both (rare)

Pathogenesis:

It results from unbalanced hemoglobin synthesis caused by decreased production of at least one globin polypeptide chain.
α-***thalassemia:*** caused by diminished synthesis of alpha chain of hemoglobin.

β-***thalassemia***: results from diminished production of β. Polypeptide chains of hemoglobin. [The heterozygous form (Thalassemia major) is the one in which hemoglobin A is completely absent].

Epidemiology:

Particularly common in persons of Mediterranean, African, Middle East, Indian subcontinent and Southeast Asian ancestry, like sickle cell anemia. It is thought to be common because carriers have been protected against malaria.

In Bahrain, the rate of beta thalassemia is 2%.

In Saudi Arabia, β-thalassemia prevalence ranges fro 1 to 15 % in various parts of the country, being highest in South (15%) and the East (13%).

Clinical Manifestations:

Alpha Thalassemia Major (homozygous): is incompatible with life, the stillborn infant displaying severe hydropsfoetalis.

Alpha Thalassemia Minor (heterozygous): shows mild anemia and no clinical symptoms.

Beta Thalassemia Major (Cooley's anemia):

1. **Symptom and signs**: (Beginning in the middle of the 1st year of life)
   - Severe hemolytic anemia
   - Hepato-spleenomegally
   - Failure to thrive
   - Bone deformity (secondary to bone marrow hyperplasia)
     - Tower skull
     - Frontal bossing
     - Maxillary hypertrophy
   - Death within few years unless supported with blood transfusion.

2. **Diagnosis:**
   - Reticulocytopenia (due to ineffective erythropoeisis
   - Peripheral blood smear:
     - Hypochromia
     - Microcytosis
     - Anisocytosis
   - Hb-electrophoresis:
     - Hb-A absent or markedly decreased
     - HbF: 30%-90%

3. **Therapy:**
   - Transfusion with packed RBCs
   - Spleenectomy and penicillin prophylaxis
   - Chelating agent for iron (to prevent hemochromatosis e.g. deferoxamine together with vitamin-C
   - Surveillance for hepatitis-C
   - Immunization
     - Pneumoccocal
     - Hemophilus influenza

Beta Thalassemia Minor:

1. **Symptoms and signs**
   - Asymptomatic
   - Mild anemia (10 g/dl)

2. **Diagnosis:**
   - Peripheral blood smear
     - Hypochromia
     - Microcytosis
     - Anisocytosis

N.B *findings in peripheral blood smear are severe compared to mild iron deficiency anemia (disproportion). It is important to differentiate Thalassemia minor from Iron deficiency anemia (see anemia) to prevent inappropriate therapy with iron.*

- Hb electrophoresis:
- High Hb A2
- High Hb F (sometimes)

3. **Therapy:** No necessary treatment
4. **Prevention:** Premarital genetic counseling

Glucose-6phosphate dehydrogenase (G6PD) deficiency

Definition:

G6PD – deficient RBCs do not generate an enough amount of reduced glutathione that is sufficient to protect the red blood cells result in weakness in the RBCs membrane predisposes these patients who have this defect to hemolysis.

Biochemistry:

G6PD is the first enzyme in the hexose monophosphate (HMP) shunt and the only point into this pathway from glycolysis.

MP shunt produces the reducing agent: reduced glutathione which is used to protect RBCs against oxidative insults.

Pathogenesis:

Not total absence of the enzyme but reduced halflife or increased destruction.

Most patients do not have anemia in their sturdy state.

- Normal retick count
- Mildly decreased RBCs lifespan
- Minority of cases have chronic hemolysis.

Genetics:

Gene on X chromosome, sex-linked trait

Heterozygous females far better than males: Only 50% of them are affected.

Homozygous male and female are equally affected

Epidemiology:

- It is the most common type of enzymopathies
- Affect millions of people worldwide, mainly the same racial groups affected by thalassemia.
- It is sex-linked (affects males predominantly)
- It is seen up to 10% of the world population
- African –American prevalence: 12% of men
- Meditarrian: 20-30% of men
- Kurdish: 60-70 % of men
- In Bahrain, it affects up to 26%
- In Saudi Arabia, Frequency ranges from 1 to 30 % with highest rate in Eastern and Jizan Regions

Classification:

1. ***"The A variant":*** Mainly among African people is associated with iso-enzymes that deteriorate rapidly (Half life 13 days)

2. ***"The Mediterranean variant"*** mainly among Greek and Italian descent. It is associated with almost complete absence of enzyme activity, even in young cells, due to extreme instability (half life is several hours)

Trigers:

1. Infection (most common)
2. Diabetic Ketoacidosis
3. Low pH in oxidative stress
4. Drugs: (always check your drug formula)

   4.1 Antimalarials
   - Primaquine
   - Pamaquine
   - Quinine

   4.2 Sulphonamides
   - Cotrimoxazole
   - Sulphapyridine
   - Sulphoxone

4.3 Analgesics
- Actylsalicyclic acid (Aspirin)
- Phenacitin
- Aminopyrine

4.4 Nitrofurans
- Nitrofurantoin
- Nitrofurazone

4.5 Miscellaneous
- Chloromphenicol
- Nalidixic acid
- Naphthalene
- Methyline blue
- Quinidine
- Probencid
- Dimercaprol
- Fava beans

Clinical Manifestation:

- Episodic hemolytic anemia that is drug induced, infection or other oxidants.
- There is a lag period of 1-3 days after which a brisk hemolytic process ensues.
- The subsequent steps depend on the type.

Type A:
- Self limited hemolysis is confined to the older RBCs
- Recovery occurs as young RBCs with enzymes activity sufficient to resist oxidant stress.

Mediterranean type:
- Patients have hemolysis that destroys most of RBCs.
- May require transfusion until the drug is eliminated.
- Acute hemolysis:
  Jaundice, dark urine
  Anemia: pallor, tachycardia, Systolic ejection murmer.
  Abdomen and back pain (mesenteric ischemia).
  Acute drop in Hb by 3-4 g/dl.

- Chronic hemolysis: hepatosplenomegaly.

Investigations:

CBC: - Normocytic
- Normochromic
- Anemia
- Reticulocytosis

Blood film:
- Spherocytes
- Fragmented red cells
- Microcytosis
- Heinz bodies

Haptoglobin - Low

Coombs' test - Negative (Direct/indirect)
Bilirubin - Elevated (Direct/indirect)

Urinalysis - Hemoglubinuria
- Elevated urobilinogen

G6PD level: - Usually normal or even height in acute state. It needs 3-weeks after acute hemolytic episode to avoid false–negative result from younger cells.

Therapy:
- Rehydration(renal protection)
- Removal of oxidative streesor.
- Blood transfusion if indicated
- Education is the most effective measure of therapy.

Anemia

Definition:

Anemia is defined as hemoglobin less than normal value according to age and sex.

- Less than 13.5 g/dl in adult male.
- Less than 12 g/dl in adult female.
- Less than 11 g/dl in pregnancy.
- Less than 10.5 g/dl in children.

Anemia may be classified to many types according to the size of Red Blood Cells (RBCs) or according to the underlying causes.

Epidemiology:

- The most common types of anemia among Saudis are iron deficiency and genetic anemia.
- Anemia can occur at any age but the children and adult females are the most common affected groups.
- Age (children, adolescent, geriatrics).
- Sex (female affected more than males, lactating and pregnant mothers are also vulnerable).
- Ethnic group (blacks are at high risk of genetic anemia).
- Vegetarians (Those who do not eat meat, eggs, cheese).

Interviewing

Socio-demographic data:

Age, sex, occupation, socio-economic status.

Dietary history:

Type and amount of food.

Present History:

- Fatigue, dyspnea, dizziness (severe anemia).
- Headache, poor concentration (severe anemia).
- Neurological pain, paraesthesia (Vit-B12 deficiency anemia).
- Palpitation, syncope (severe anemia).
- Anorexia, weight loss (chronic disorders and malignancy).
- Diarrhoea, heart burn (Gastrointestinal causes).

Bleeding from any of the following orifices:

Rectum, mouth, nose, vagina, urethra.

Inadequate intake of iron or vitamins

Dietary insufficiency.

Increased requirements:

Lactation, pregnancy, growth.

Mal-absorption:

Celiac disease, post-gastrectomy.

Chronic hemolysis:

Hemolytic anemia.

Infestation:

- Tapeworm, Round worm

Auto-immune disease:

Pernicious anemia

Drugs:

- Aspirin
- Anti-convulsants
- Anti-tumours

Alcohol:

Chronic diseases:

- Chronic infection
- Inflammation
- Cancer
- Liver disease
- Kidney diseases

Surgical history:

Gut surgery

Family history:

- Sickle cell
- Thalassemia
- G6PD
- hemophilia

Physical Examination

General Status:

- Low body weight (malnutrition)
- Muscles wasting (malnutrition)
- Pallor of conjunctiva and nail beds.
- Koilonychia (spoon like nails)- Iron deficiency anemia
- Glossitis, stomatitis, cheilosis (Iron deficiency anemia)

Gastrointestinal system:

- Splenomegaly (hemolytic anemia).

Cardiovascular system:

- Tachycardia, heart murmur, congestive heart failure (severe anemia).

Nervous system:

- Loss of vibratory and position sense, memory loss, mood changes and limb weakness.(Vitamin B12 deficiency)

Investigations

Laboratory findings in iron deficiency anemia:

a. Complete blood count (CBC)
- Microcytosis (Low MCV)
- Hypochromic (Low MCH)
- Reticulocyte (Low number of reticulocytes)
- Red cell distribution width (High)
- Thrombocytosis

b. Blood Peripheral Smear
- Anisocytosis = unequal size of RBCs
- Poikilocytosis = different size of RBCs
- Target cells
- Hypochromacia

c. Special Tests:
- Low serum iron <60 ng/dl
- High total iron binding capacity (TIBC) >360 ng/dl
- Low serum ferritin (<12 ng/dl)
- High serum transferrin receptors (>8.5 mg/L)
- Bone marrow show absence of stainable iron

Laboratory finding in macrocytic anemia:
- Macrocytosis (MCV >95 fl).
- Low B12 level <110 pg/ml is earliest finding in vitamin B12 deficiency.
- Hyper segmented neutrophils (>5 lobes in cell nucleus).
- Low serum folate level <5 ng/dl.

Laboratory findings in anemia of chronic diseases:
- Hematocrit is rarely falls below 25% except in renal failure.
- MCV is usually normal.
- Red blood cell morphology is not diagnostic.
- Reduced serum iron and TIBC.
- Transferrin level maybe very low.

- Anemia of normocytic and normochromic in nature (normal MCV and MCH).

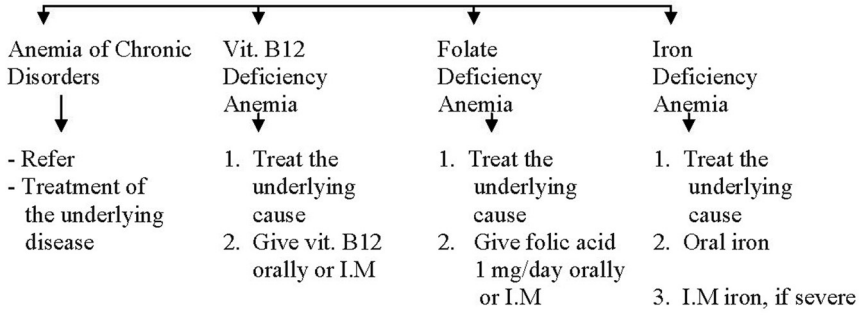
Other test:

- Hemoglobin electrophoresis (genetic anemia)

Management

- Identify the underlying causes
- Identify the type of deficiency (if any) - iron, vitamin B12, folate
- Identify the severity of anemia (Hb <7 g/dl is considered severe anemia)
- Start the appropriate treatment accordingly (see algorithm)
- Appropriate follow up and monitoring of:
  - Symptom and signs.
  - Compliance to drugs.
  - Hemoglobin level.
  - MCV and MCH.
  - Reticulocyte.
- Refer the patients if he/she needs further investigations or acute and urgent therapy or no definite diagnosis made.

Management of Anemia



Oral therapy of iron deficiency anemia:

- Oral therapy consists of 150-200 mg of elemental iron per day.
- It is given as 325 mg of ferrous iron tablet TID.

- Dose of Iron for children is 6 mg/kg/day divided in doses.
- 10-20 mg of this iron is absorbed daily.
- For children (give 6 mg of elemental iron / kg/day divided into three doses).
- Given on empty stomach, if not tolerated it could be given with food.
- Hemoglobin usually comes to its normal value within two month of therapy.
- Iron replacement therapy should be continued for 3-6 months to replenish iron store.
- Side effects of oral iron therapy include: nausea, abdominal pain, constipation, diarrhea and heart-burn.
- Iron absorption could be impaired by milk, antacids and food.
- With adequate iron therapy, the maximum reticulocyte count occurs within ten days.
- Hemoglobin rises at the rate of 0.7-1 g/week.

Intra-muscular therapy in iron deficiency anemia:

Intra-muscular therapy in iron deficiency anemia is indicated in the following conditions:

- If oral therapy is not tolerated.
- Mal-absorption.
- Inflammatory bowel diseases.
- Severe iron deficiency (hemoglobin< 7g/dl) .
- On-going blood loss.
- Severe intractable side effect of iron.

Prevention of anemia

Primary prevention:

- Health education about food rich in iron and vitamins (meat, egg, vegetable and fruits).
- Provision of iron fortified food during early childhood.
- Limiting the early introduction of cow's milk before 12 months of age.

- Providing iron and folic acid during pregnancy and post-natal period.

Secondary prevention:

- Screening of high risk groups e.g. pregnant mothers, infants, pre-school children and pre-marital testing for genetic anemia.

Road Traffic Accidents (RTAs)

Definition:

Road Traffic Accident is defined as any injury occuring as a result of car related accidents.

Epidemiology:

- Car accidents are responsible for 15-20% of deaths in Saudi Arabia.
- It is estimated that 250,000 RTAs occur annually.
- According to Mortality Report issued by Ministry of Health in Saudi Arabia:
  a. The total deaths of RTA was 20269 persons during the years of (1997, 1998, 1999, 2000, 2001).
  b. Most of the victims were between 25-50 year old (44%).
  c. Males were affected more than females (83.8% vs. 16.2%)
  d. Two-thirds of the deaths occurred before reaching the hospitals.
  e. About one-third of accidents occurred during the months of Ramadhan, Dhul-Qada, Dhul-Hijja (30%).
  f. About one-third of deaths were due to head injury.

Causes of RTAs:

- High speed is the most common cause of RTAs (44%).
- Bypassing the road traffic signal (12%).
- Driving of cars by young people who are below the legal age of driving (20%)
- Driving while suffering from diseases or when unhealthy (illness, stress, insomnia, partial blindness).
- Rough roads.

Effects of RTAs:

Psycho-social effects:

- Poverty.
- Illiteracy.
- Depression.
- Anxiety.
- Use of illicit drugs.
- Crimes.
- Suicides.

Economic effect:

- About 21 billions Saudi Riyals are lost every year.
- Decrease national productivity by 4% annually.
- Decrease family income.
- Loss of competent manpower.

Health effect:

- Increase in mortality (more than 4000 deaths annually).
- Increase in disability (more than 2000 disabilities annually).
- Increase in morbidity (more than 30,000 injuries annually).
- Increase in rate of admission and bed occupancy in hospital (30% of the hospital bed are occupied by RTA patients).
- Increase in utilization of emergency services and diagnostic services.
- Increase in the number of patients in the waiting list.

Prevention of RTAs:

- Driving vehicles at a reasonable speed.
- Drivers should check-up their cars regularly.
- Drivers should not drive their cars unless they are physically and psychologically fit.
- Drivers should not bypass the road traffic signals.
- Individuals below 17 years should not drive cars.

- Drivers should know the physical nature of the road when they drive through.
- Divers should be aware of the other cars and walking persons on the road.
- Drivers should stop their journey if they are ill or tired.

Jaundice

Definition:

Jaundice is defined as the yellowish discoloration of the skin and mucus membranes caused by an elevated serum bilirubin levels of 2-3 mg/dl in newborns, the threshold for visible jaundice is 5-6 mg/dl.

Classification:

1. Unconjugated hyperbilirubinemia: the indirect fraction of bilirubin exceeds 80% of the total bilirubin.

2. Conjugated hyperbilirubinemia: the direct fraction of bilirubin ranges from 20-60% of the total bilirubin.

Epidemiology:

- About 4% of hospital admissions are due to jaundice

Pathophysiology and differential diagnosis:

1. Over production (Pre-hepatic jaundice)

- Immune hemolysis:
  - ABO incompatibility
  - Rh isoimmunization
- Non-immune hemolysis
  - G6PD
- Spherocytosis
- Extra-vascular
  - Cephalohematoma hemolysis
- Intra-marrow hemolysis
  - Thalassemia
  - Pernicious anemia

2. Defective hepatic intake and conjugation (hepatic jaundice)

- Bilirubin is bound to albumin during transportation to hepatocytes
- Inside hepatocyte; the bilirubin is conjugated to form water soluble bilirubin.
- Defect in intake and conjugation found in:
  - Gilbert syndrome
  - Criglar-Najjar syndrome
  - Hepatitis

3. Impaired excretion (Obstructive Jaundice)

- Normally, after conjugation, bilirubin is excreted in bile and transported to the biliary system to reach the gastro-intestinal tract.
- Obstruction can occur at the following levels:
  - Cellular level: e.g. Hepatocellular disease.
  - Ductule level: e.g. Phenothiazine exposure
  - Septal ducts level: e.g. Primary biliary cirrhosis
  - Bile duct level: e.g. Pancreatic tumor
- These obstruction can lead to conjugated hyperbilirubinemia.

- Conjugated bilirubin (water soluble), level of bilirubin in the urine will increase unlike unconjugated (water insoluble) which is reabsorbed from intestine through enterohepatic circulation.

Neo-natal Jaundice

- **Physiologic Jaundice:** increase in unconjugated bilirubin in full term infant appears in the 3rd day of life that resolves by 10th day. (Total bilirubin <12 mg/dl, direct bilirubin < 1.5 mg/dl)
- **Non-physiologic jaundice**

  (The Rule of Toos)

  - Bilirubin rises too early 1st 24 hrs of life
  - Bilirubin rises too fast: >5 mg/dl/day
  - Bilirubin rises too long >10 days (full term)
    > 2 wks (pre-term)

- Bilirubin rises too high: total bilirubin >12 mg/dl (full term) >15 mg/dl (pre-term)

- Bilirubin rises too direct: Direct bilirubin >1.5 mg/dl

Interviewing

Aim:

- To rule out serious conditions
- To establish diagnosis
- To establish a rapport with the patient.
- To guide physical exam and management

Bio-demographic data:

Name:

Age: Neonate, infancy, childhood, adulthood.

Sex: Primary biliary cirrhosis, gallstones and lupoid hepatitis are more common in females. Pancreatic carcinoma, alcoholic liver disease and G6PD deficiency are more common in males.

Job: Contact with infected people with hepatitis A. e.g. day care center or contact with unsanitary water.

Chief complaint:

Yellowish discoloration of the sclera. (Patient may come with other complaint as his/her main concern and with jaundice as an associated symptom/sign).

History of presenting complain:

Onset of Jaundice:

Rapid: this might indicate

- Infection
- Drug reaction
- Hemolytic anemia
- Acute choledocolithiasis

Fluctuating (comes and goes) ; this might indicate:

- Gilbert syndrome (especially when patient fasting or ill)

- Criglar-Najjar syndrome
- Recurrent common bile duct stones
- Congestive heart failure

Gradual: might indicate:

- Cirrhosis
- Hepatic metastasis
- Pregnancy
- Primary biliary cirrhosis

Associated symptoms:

- Pruritis
  - severe: Extra-hepatic obstruction.
- Abdominal pain:
  - Colicky right upper quadrant: Choledocolithiasis
- Fever + chills:
  - cholangitis
- Flu-like symptoms:
  - hepatitis
  - viral infection.
  - drug induced
- Acholic stool:
  - Obstructive jaundice
- ↓ weight:
  - Carcinoma

Risk factors:

- Blood transfusion: hepatitis
- Drug addiction: infection (hepatitis)
- Contact with patient of jaundice: infection e.g.hepatitis-A.

System involved (see gastrointestinal symstem review)

Past medical history:

- History of similar problem
- Surgical:
  - Previous surgery
  - Previous blood transfusion
- Medical

- History of hepatitis
- History of heart disease

Family history:

- Similar problems in relatives
- History of chronic disease - Diabetes Mellitus.
  - Hypertension
  - Rheumatological disease

Drug history:

Self prescribed:

- Over the counter e.g. paracetamol
- Herbal therapy (common)

Prescribed:

- Anti-diabetic
- Anti-lipid
- Others

Drug Abuse:

- Oral e.g. amphetamines
- Injestions (I.V.)
- Steroid
- Others

Lifestyle:

- Smoking
- Alcohol (CAGE questionnaire screening)

Psychosocial

Idea: Patient's belief: patient might think it is a Black magic etc.

Concern: patient may have a concern that:
- the cause is a serious: e.g. cancer, hepatitis, other
- it is infectious to his children and spouse
- he/she may be fired from his/her work especially expatriates.

***Expectations*:** the patient might expect from you:
- To reassure him/her that his/her illness is benign

- To request other investigations
- To refer him/her to a high specialized centre

Effect *(Impact)*

- Patient might keep himself away from his family members (? Infectious).
- He/she might not be allowed to continue in his work.
- His/her friends might try to keep themselves away from him/her.

Psychological Symptoms:

Depression: Quick review for depression criteria start with major if positive, then go for minors

- Pancreas cancer. Commonly associated with depression
- Severe pruritis can cause depression

Anxiety: If appropriate review anxiety criteria.

Stress: Check for sources of stress in patient's life at:
- Home
- Work
- Social environment

Support system: Explore available sources of support for your patient within the family, community agencies and others.

Hidden agenda:

- Ask your patient: Is there anything else you think I should ask about?

  Patient may be worried of cancer

  However, he was not able to express his feeling.

Physical Examination

Aim:

- To determine diagnosis
- To guide the management

- To maintain doctor/patient relationship
- To reassure the patient

General observation:
- Looking: ill/well
- Vital signs.
- Weight and height (BMI)

Upper limbs:
- look for signs of injections: I.V. drugs
- Urticaria: hepatitis B infection

Eyes:
- Yellowish sclera
- Xanthoma: hypercholesterolemia. in case of chronic cholestasis (primary biliary cirrhosis)
- Kayser-Fleischerring: Wilson disease

Chest:
- Spider angiomata: Complications of chronic liver disease
- Gynecomastia: Complications of chronic liver disease

Cardio-Vascular System: signs of congestive heart failure

Abdomen:
- Dilated veins: Cirrhosis
- Spleenomegally:
  - Cirrhosis
  - Chronic hepatitis
  - Alcoholic hepatitis
- Hepatomegally with nodules:
  - Metastasis
- Palpable gallbladder:
  - Malignant common bile duct obstruction

Testes: Atrophy: indicates liver cirrhosis
Edema:
- hepatic failure
- congestive heart failure

Management

Confirm the diagnosis

Clarification:
Explain in detail the diagnosis, nature, prognosis and available treatment and expected complications.

Reassurance:
Reassure the patient if the diagnosis is benign and reassure him that he will have the best service available.

Advise:
Avoid medications without physician's advice
To receive appropriate vaccination.
Avoid herbal medication.

Prescribing:

Pruritis
- Cholestyramin, one packet in juice TID
- Diphenhydramine 25-50 mg TID

Viral hepatitis:
- Symptomatically
- α-interferon (chronic hepatitis B, C, D)

Extra-hepatic obstruction:

Fever + chills + jaundice → CHOLANGITIS
↓
Urgent admission

***Neonatal Jaundice*:**

Check appropriate textbooks for:

- Phototherapy
- Exchange transfusion
- Breast milk jaundice
- Physiologic jaundice
- Neonates with hemolytic jaundice

Cholestatic Jaundice: Ursodeoxycholate

Other hepatocellular disease (according to the diagnosis)

Referral (According to diagnosis)

Investigations:

- CBC: all patients
- Peripheral blood smear and reticks count
- Liver function test:
  - Bilirubin - total
    - direct
  - Alkaline phosphatase
  - Transaminases - ALT
    - AST
- Prothrombin time

- Urinalysis for:
  - Bilirubin
  - Urobilinogen

- Special tests:
  - Viral hepatitis studies
  - Antimitochondria antibody (Primary biliary cirrhosis)
  - Serum iron, transferrin, ferritin (Hemochromatosis)
    - Serum ceruloplasmin/urine copper (Wilson's disease)
    - Antinuclear and smooth muscle antibodies (Lupoid hepatitis)

- Serum protein electrophoresis (α_1 - antitypic deficiency)
- Ultrasonography (Extra-hepatic obstruction)
- C.T. scan (Extrahepatic obstruction)
- ERCP or PTC (Extra-hepatic obstruction)
- Liver biopsy
- Follow-up: According to the diagnosis

- **Prevention:**
  - If hepatitis B, A, vaccinate other family member.
  - Avoid any medication without medical advice.

Viral Hepatitis

Definition:

- Infective Hepatitis is an inflammation of the liver cells due to viral agents.
- Viral Hepatitis may be classified according to the serotypes.
- There are seven forms of viral hepatitis(A, B, C, D, E, F, G)

Epidemiology:

- Worldwide, Hepatitis B and C are the most common forms of hepatitis.
- Hepatitis-A is common in developing countries due to poor sanitation and overcrowding.
- Travelers are at high risk to get hepatitis-A.
- Hepatitis-B, C, D and G are transmitted mainly through intravenous drugs, blood transfusion, sex and hemodialysis.
- Hepatitis A and E are usually transmitted through oro-fecal route.
- In 2000, the total number of Hepatitis cases reported in Saudi Arabia were 8786. One-quarter of these cases were of hepatitis- A (2250 cases), 38% of hepatitis - B and 24% were of Hepatitis-C.
- The incidence rate of Hepatitis - A was 12.3 per 100,000 among Saudis and 7 per 100,000 among Non-Saudis
- The incidence rate of Hepatitis-B was 16.8 per 100,000 among Saudis and 15.6 per 100,000 among Non-Saudis.
- The incidence rate of Hepatitis - C among Saudis and non-Saudis was 9.8 and 12.4 per 100,000 respectively.
- Most of the Hepatitis-A cases occur among children less than 15 years old.
- Most of the Hepatitis-B cases occur among the adults (15-45 years old).
- Most of non-specific hepatitis cases occur among the age group of 15-19 years.

- Males were affected more than females in all types of viral hepatitis.

Differential diagnosis:

Most of the patients diagnosed as hepatitis usually present with jaundice, abdominal pain, nausea, vomiting and dark urine. However, the following conditions should be differentiated from viral hepatitis.

- Hemolytic anemia.
- Obstructive jaundice.
- Drug induced hepatitis.
- Congestive heart failure.
- Liver cirrhosis.
- Malignancy.

Interviewing

Aims:

- To rule out serious causes of hepatitis (Drug induced hepatitis).
- To grade the severity of hepatitis (Acute necrotic hepatitis).
- To guide the management.

Patient characteristics: age, sex, occupation, marital status.

Chief Complaints & systemic review:

- Anorexia, nausea, vomiting.
- Fatigue.
- Abdominal pain.
- Headache.
- Fever.
- Diarrhea.
- Dark urine.
- Pale stool.

Past history:

- Similar attacks.

- Liver diseases.
- Gall-bladder diseases.
- Admission to hospital.
- Blood transfusion.

Family history:

- Contact with a person suffering from jaundice
- Similar attacks among family members.
- History of jaundice and liver diseases.

Drug history:

- Current use of drugs such as Paracetamol, Aspirin, Anti-Tuberculosis drugs.
- Alcohol.
- Other illicit drugs.

Psycho-social aspects:

- Travelling outside.
- Practising unsafe sex.
- Eating uncooked vegetables and drinking un-bottled water.
- Sanitation and sewage management at home.

Physical Examination:

- General status (well, ill, toxic, in pain).
- Vital signs (blood pressure, pulse, temperature).
- Skin and mucous membrane (pallor, jaundice).
- Chest (gynecomastia).
- Gastrointestinal (tenderness, hepatosplenomegally, ascitis).
- Lower limbs (edema).

Investigations:

- Liver function test (High liver enzymes).
- Hepatitis Serology.
- Abdomen ultrasound (to rule out similar conditions and to see liver size)

Management

Hepatitis -A:

- Clarification (What type of hepatitis?)
- Reassure the patients (most of the conditions are self-limited).
- Education of the patient (nature of the problem, self-care and preventive measures).
- Rest.
- Fat – free diet.
- Carbohydrate rich diet (honey, juice).
- Avoid alcohol and hepatoxic drugs.
- Good personal hygiene.
- Do not handle food for others.
- Wash hands carefully after toilet.

Prognosis:

- Most of Hepatitis-A cases are cured without complication.
- The mortality rate <0.5%
- There is no phase of chronicity
- Admission to hospital is not necessary in most of the cases

Prevention of Hepatitis-A:

- Good sanitation and effective garbage disposal.
- Hand washing.
- Give immunoglobulin 0.03-0.06 ml/kg to contacts within 2 weeks of exposure and also to travellers going to endemic areas.
- Active immunization can be given as two doses to the following population at risk.
  - Travellers to endemic areas of HAV infection.
  - Homosexuals.
  - IV drugs abusers.
  - People who have occupational risks for infection.
  - People with Chronic liver diseases.
  - People who have clotting factor disorders.
  - Food handlers.
- Report the cases to the local health authority.

Hepatitis - B

- Clinical manifestations of acute Hepatitis – B is similar to Hepatitis – A.
- Incubation period of Hepatitis B is longer than Hepatitis –A (5 – 25 weeks).
- High liver enzymes
- Hepatitis – B serology (see the table).

Serologic findings in Hepatitis-B

HB-sAg	Anti-HBs	Anti-HBc	HBeg	Anti-HBe	Interpretations
+	-	IgM	+	-	Acute Hepatitis-B
+	-	IgG	+	-	Chronic active Hepatitis
+	-	IgG	-	+	Chronic inactive Hepatitis
-	-	IgM	±	-	Acute Hepatitis B
-	+	IgG	-	±	Recovery
-	+	-	-	-	Vaccination immunity

Treatment:

- Acute hepatitis-B is usually managed as acute hepatitis-A.
- Chronic hepatitis-B should be referred to hepatologist for further management.
- Follow up of the patient (liver enzymes every six months for observation)

Prognosis:

- Hepatitis – B is usually self-limited or sub-clinical.

- 5-10% of cases of hepatitis –B will become chronic carriers.
- About 3% of chronic carriers may develop chronic active hepatitis, cirrhosis or hepatoma

Prevention:

- Active immunization using hepatitis-B vaccine as three doses for children and for those at high risk of hepatitis-B (Intravenous drug users, renal dialysis patients, recipients of blood or blood products prior testing, sexual partners of Hepatitis-B, health care workers, garbage collector, prisoners, travellers to endemic areas).
- To non-immune persons give hepatitis-B immunoglobulin.
- Prenatal screening of all pregnant women.
- Pre-employment screening of all workers coming to Saudi Arabia for any type of work.
- Immunoglobulin to newborns of mothers with positive hepatitis-B serology and those exposed to needle sticks.

Hepatitis – C

Diagnosis:

- Most of Hepatitis-C cases are asymptomatic and only some of them show minimal symptoms.
- Most of hepatitis-C cases show fluctuating liver enzymes mainly ALT.
- Hepatitis-C is diagnosed by liver function test (high liver enzymes) and Hepatitis- C virus serology.
- Positive HCV Antibody - indicate exposure while positive HCV polymerase Chain Reaction (PCR) indicate chronic viraemia.

Treatment:

- All patients diagnosed as Hepatitis-C should be referred to the hepatologist for further care (prescribing Interferon and Ribavirin).

Prognosis:

- About 70% develop chronic hepatitis-C and about 10-25% develop liver cirrhosis over a period of 20-30 years.

Prevention:

Preventive measures include the following:

- All Hepatitis-C patients should not donate blood or body organs.
- All Hepatitis-C patients should not share needles or equipment such as toothbrush, razors, scissors.
- All Hepatitis-C should cover-up cuts and wound with adequate dressing.
- All Hepatitis-C should practise safe sex by using condoms.

Brucellosis

Definition:

Brucellosis is a zoonotic bacterial disease which is transmitted to humans from infected animals after consumption of un-pasteurized milk or milk products or raw meat.

Epidemiology:

- Brucellosis is common in many parts of the world. It is an endemic disease in Middle East and Latin America.
- Most of the cases are seen during summer.
- Infectious agents are (Brucella melitensis, B. abortus, B. suis and B. canis).
- High risk groups:
  a. Farm workers.
  b. Veterinarians.
  c. Abattoir workers.
- Males are commonly affected than females
- Reservoir: Cattle, goat and sheeps.
- Mode of transmission: By contact with tissues, blood, urine, aborted fetuses, ingestion of raw milk or eating raw liver.
- Incubation period is variable but usually ranges from 5-60 days (1-2 months) but sometimes takes several months.

Interviewing

Bio-data:

- Age, sex, occupation, place of residence.

Chief complaint:

- Nature, duration, onset, frequency, severity.

Associated symptoms:

- Fever (100%): continuous, intermittent undulant.

- Headache.
- Sweating.
- Weakness.
- Chills.
- Arthralgia (60%).
- Weight loss.
- Generalized aching (back, abdomen).
- Anorexia.

Physical examination

- High temperature.
- Arthritis "sacroillitis" (20-60%).
- Splenomegaly (20%).
- Hepatomegaly (5%).
- Lymphadenopathy.
- Epididymo-orchitis (2-20%).
- Pallor.

Management

Laboratory Diagnosis:

Blood culture:

- More likely to be negative.
- Needs three weeks time to read the results.

Serology:

- Standard Tube Agglutination Test (STAT) above 1:100 support the diagnosis
- ELISA Test for IgM antibodies if STAT is negative especially in the acute phase of brucellosis.

Treatment:

- Treatment of brucellosis should be continued for 6 – 8 weeks.
- The regimen consists of:
  - Rifampicin 600-900 mg OD.
  - Doxycyclin 200 mg OD.

- If relapse occurs re-treatment by the same regimen for eight weeks.

Prevention:

- Health education of the public, not to drink un-pasteurized milk, milk product or eat uncooked meat.
- Educate farmers, butchers about the nature of the diseases, method of transmission and risk of handling of products of the infected animals.
- Educate the farmers about the importance of immunization of animals against brucellosis.
- Report the case to the local health authority.

Tuberculosis (TB)

Definition:

Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis. The disease primarily affects lungs and causes pulmonary tuberculosis. It can also affect almost all the parts of body and the tissues.

Epidemiology:

- TB is one of the most common diseases in the world .It is estimated that eight million people are infected by TB annually.
- About 3 millions all over the world die per year.
- It is estimated that during the coming ten years, ninety million will be infected with TB.
- In Saudi Arabia, it has been reported that the incidence of pulmonary TB declined from 30.5/100,000 in 1987 to 4.9/1000,000 in year 2002.

The health reports issued by Ministry of Health in Saudi Arabia revealed that during 2000, the total number of T.B. cases was 2322. Most of them (1416) were among the age group of 15-44 years,and males represented more than 50% of cases).

Types of TB:

There are two main forms of TB:

a. Pulmonary TB: This is the most common form of TB (80%).
b. Extra-pulmonary TB (20%).

Extra-pulmonary TB affects bones, lymph nodes, meninges, skin, uro-genital organs, and gastrointestinal systems.

Clinical features:

Pulmonary Tuberculosis presents with chronic cough in addition to one or more of the following symptoms:

- Fever not responding to antibiotics
- Chest pain.
- Hemoptysis.
- Dyspnea.
- Weight loss.
- Night sweating.
- Fatigue.

Extra-pulmonary TB manifestations differ as per the affected organ:

- Enlarged lymph nodes (lymphadenitis)
- Painful and swollen joints (TB arthritis)
- Headache, fever, neck rigidity and confusion (TB meningitis)
- Infertility (TB orchitis or salpingitis)
- Paraplegia (spinal TB)
- Splenomegaly.
- Abdominal mass (Gut TB or Koch's abdomen).

Differential Diagnosis:

Clinical features of TB are not specific and many variations can be seen:

- Malignancy.
- Brucellosis.
- Typhoid fever.
- Chronic bronchitis.

Diagnosis of Tuberculosis:

Pulmonary TB:

Pulmonary TB is diagnosed if:

A. The patient has at least two sputum sample positive for Acid-Fast-Bacilli (AFB) by direct microscopy. or

B. A patient who has only one sputum sample positive for (AFB) and radiological manifestations of T.B. or
C. A patient who has at least two sets (two weeks apart) of sputum sample negative for AFB with radiological chest manifestations consistent with TB (chest X-rays should be discussed with radiologist or chest physician).

Extra-pulmonary TB:

Extra-pulmonary TB is diagnosed if:

A patient who has a fluid positive for AFB from an organ other than lung or has a positive tissue culture for AFB.

Tuberculin Testing (Mantoux Test):

- It is a purified protein derivative (PPD) derived from tubercle bacilli.
- Tuberculin injected into the skin of an infected person produce a delayed local reaction within 24-72 hours.
- The reaction is evaluated by measuring the diameter of the skin induration at the site of injection.
- Tuberculin test is negative when the diameter of the skin induration is less than 10 mm.
- An induration of 15 mm or more is considered positive in a person who had BCG.
- In HIV patients, the test is considered positive if the diameter of the induration is ≥5 mm.
- Negative tuberculin test does not exclude tuberculosis.
- A positive tuberculin test is helpful tool to diagnose TB but it is not a confirmatory test.

Treatment of Tuberculosis

Directly Observed Treatment, Short Course (DOTS)

DOTS is the optimal way for treating patients due to the following advantages:

- Rapid conversion of positive sputum to negative for AFB will result in decreasing the communicability (Transmission of infection).
- Short duration of treatment helps the patients to comply with drugs.
- High cure rate and low mortality rate.
- Low cost.
- Decrease in complications of TB.
- Decrease drugs resistance.

Phases of Treatment:

The initial phase:

- The initial phase takes two months.
- Regimen consists of four drugs.
- This regimen will help to eliminate TB from the body and decrease drug resistance.
- This phase may be extended by one month more if the sputum is still positive by the end of the second month of treatment in new cases and at the end of the third month in re-treated cases.

The continuation phase:

- This phase continues for four months
- Two drugs are used

Indications for hospitalization:

- All pulmonary cases with positive AFB sputum.
- All critical cases.
- All complicated cases.

Rules of Treatment of TB:

- The duration of therapy should not be less than six months to ensure cure and to avoid relapse.

- The patient should be followed-up regularly in order to ensure good compliance with drugs and to perform sputum examination for AFB.
- Sputum examination should be done at the end of the second month of treatment for new cases, third month, fifth month and at the end of treatment for relapse or failure cases.
- If smear remain positive by the end of the 2nd month for new cases or 3rd month for relapse or failure cases, the initial phase should be extended to another month.
- If smear remain positive by the end of the third month, the treatment should be stopped for three days and sputum sample should be examined for culture and sensitivity and then the continuation phase is to be continued to fourth month.
- If sputum remains positive by the fifth month the patient is to be registered as failure.
- If the case was negative at the beginning of treatment and converted to positive by the end of the 2nd month, it should be re-registered as failure case.
- Kidney and liver function tests should be done before initiation of Anti-TB drugs to ensure their normal function and to have base line information in case of developing side effects affecting these organs.

Anti-Tuberculosis Drugs:

Isoniazid (INH)

- Dose: 5 mg/kg.
- Adverse effects: hepatitis, and elevated liver enzymes, neurological symptoms.
- It is advised to use pyridoxine with (INH) in special situation (DM, Neuritis, epilepsy, pregnancy, uremia, malnutrition and alcohol abuse) to prevent neuritis.

Refampicin

- Dose: 10-20 mg/kg; maximum dose 600 mg/daily.
- Adverse reactions:

Hepatitis, elevation of liver enzymes, thrombocytopenia, renal failure, skin, rash, gastrointestinal disturbance, urine discoloration.

Pyrazinamide:

- Dose: 15 – 30 mg/kg daily(Maximum dose 2000 mg)
- Adverse reaction:
  - Hepatitis
  - Rash
  - Hyperuricemia

Ethambutol:

- Dose: 15-25 mg/kg daily (Maximum dose 2500 mg)
- Not recommended for children < 6 years of age.
- Adverse reactions:
  - Optic neuritis
  - Decrease visual acuity
  - Loss of red-green color perception

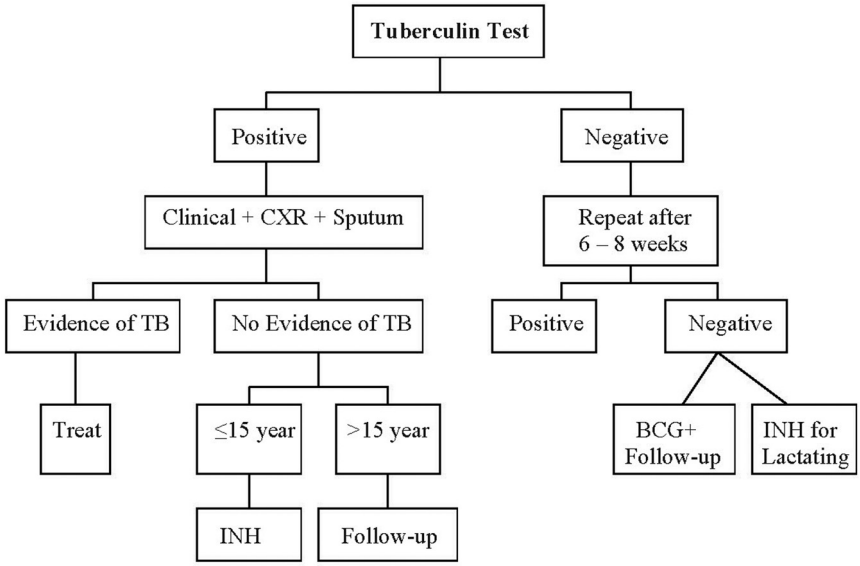
Streptomycin:

- Dose: 15 mg/kg daily (0.75 gm)
- Adverse reactions:
  - Allergy, nephro toxicity and ototoxicity
- Initial phase (intensive phase) consists of Isoniazid, Rifampicin, Pyrazinamide & Ethambutol for 2 months.
- Continuation phase consists of Isoniazid and Rifampicin for four months.
- The above regimen is administered to new cases of all types of TB.

Preventive Measures:

- All TB cases should be reported to the local health authority.
- All contacts should be investigated as illustrated in flow chart.
- All TB cases with positive sputum smear for AFB should be isolated till a negative smear is obtained.
- All patients with TB should be educated about the importance of compliance with drugs, side effects, and regular follow up.
- INH should given as mentioned in the flow chart.
- Family involvement in TB management is essential to increase the rate of compliance with drugs and appointment and to reduce the rate of defaulter and drug resistance.

Management Flow Chart for the Contacts of Tuberculosis



Note: INH should be given as a preventive therapy (5 mg/kg /day for six months)

Dosage for multi-drug therapy of active tuberculosis[+]

Drug	Dosage form	Adverse reaction	Monitoring	Once Daly Dosage	
				Adult	Children
Isoniazid	Tablets: 100 mg Syrup: 50 mg/ml	Hepatitis Peripheral neuropathy	35 years of age or older: baseline and monthly liver function tests, monthly clinical examination	5 mg/kg (maximum daily dose 300 mg)	10-20 mg/kg (maximum daily dose 300 mg)
Ethambutol	Tablets: 100 mg Tablets: 400 mg	Optic neuritis Decreased visual acuity and loss of red-green color perception	Monthly red green color discrimination testing and visual acuity testing	15-25 mg/kg (maximum daily dose 2500 mg)	15-25 mg/kg (maximum daily dose 2500 mg) NB: not recommended for children <6 years

Pyrazi-amide	Tablets 500 mg	Hepatitis Hyperuri-cemia Rash	Base-line and monthly liver func-tion tests, monthly uric acid	15-30 mg/kg (maxi-mum daily dose 2000 mg)	15-30 mg/kg (maxi-mum daily dose 200 mg)
Rifam-picin	Capsules: 150 mg and 300 mg Syrup: 10 mg/ml	Hepatitis, fever, nau-sea, vom-iting and orange colored urine	Baseline liver func-tion tests, repeat if symptoms develop	40-55 kg: 450 mg >55 kg: 600 mg (maxi-mum daily dose 600 mg)	10-20 mg/kg (maxi-mum daily dose 600 mg)
Strepto-mycin	Powder for injection	Hypersen-sitivity Nephro-toxic Impair-ment of vestibular function	Baseline renal func-tion tests and audi-tory func-tion tests	15 mg/ kg daily	15 mg/ kg daily
Refam-picin + INH	Tablets: 150 mg + 75 mg 300 mg + 150 mg	The same for in-dividual drugs	The same for individ-ual drugs	The same for in-dividual drugs	The same for in-dividual drugs

[+]National Tuberculosis Control Program, Kingdom of Saudi Arabia

Possible alternative treatment regimens for each treatment category[+]

Treatment Category	TB Patients	Alternative TB treatment regimens	
		Initial phase	Continuation phase
I	• New smear positive PTB. • New smear negative PTB with extensive parenchymal involvement. • New cases of severe forms of extra-pulmonary TB	2 EHRZ (SHRZ) 2 EHRZ (SHRZ)	6 HE 4 HR
II	• Sputum smear positive relapse. • Treatment failure. • Treatment after interruption.	2 SHRZE/1 HRZE	5 HRE
III	• New smear negative PTB (other than CATI). • New less severe form of extra-pulmonary TB	2 HRZ 2 HRZ	6 HE 4 HR

IV	• Chronic cases (still sputum positive after supervised re-treatment	Not applicable (refer to WHO guidelines for use of second-line drugs in specialized centers	

NB: Some authorities recommend a 7 months continuation phase with daily isoniazid and refampicin (7HR) for category I patients with the following forms of TB: TB meningitis, miliary TB, spinal TB with neurological signs.

[+] National Tuberculosis Control Program, Kingdom of Saudi Arabia

Formulation, acceptable daily dosages and main characteristics of anti-tuberculosis drugs available for treatment of MDR tuberculosis[+]

Drug	Formulation	Daily Dosage (mg)		Acceptability	Tolerance	Toxicity
		Min.	Max.			
1. Amino glycosides						
a. Streptomycin	Vial 1 gm	750	1000	Injection	Moderate	Medium
b. Kanamycin	Vial 1 gm	750	1000	Injection (painful)	Poor	Medium
c. Amikacin	Vial 1 gm	750	1000	Injection		
d. Capreomycin	Vial 1 gm	750	1000	Injection (painful)	Moderate	Medium
2. Thioamides						
a. Ethionamide	Tablets: 250 mg	500	750	Good	Moderate	Medium
b. Prothionamide	Tablets: 250 mg	500	750	Good	Moderate	Medium
3. Pyrazinamide	Tablets: 400 mg Tablets: 500 mg	1200	1600	Good	Moderate	Low
4. Fluourquinolones						
a. Ofloxacin	Tablets: 200 mg	600	800	Good	Good	Low

b. Ciprofloxacin	Tablets: 250 mg	1000	1500	Good	Good	Low
5. Ethambutol	Tablets: 400 mg	1000	1200	Good	Good	Low
6. Cycloserine Trizidone	Tablets: 250 mg Tablets: 300 mg	500 600	750 600	Good Good	Poor Moderate	Low Low
7. PAS	Tablets: 500 mg Granules packet 4 g	10 gm 10 gm	12 g 12 g	Bad Good	Poor Moderate	Low Low

[+] National Tuberculosis Control Program, Kingdom of Saudi Arabia

Treatment for new positive cases who interrupted treatment+

Length of treatment	Length of interrupted	Do a smear	Result of smear	Register again	Treatment
< one month	< 2 weeks	No	-	-	Continue CAT1*
	2-8 weeks	No	-	-	Start again On CAT1**
	>8 weeks	Yes	Positive	Treatment after default	Start again on CAT1
			Negative	Treatment after default	Continue CAT1
1-2 months	<2 weeks	No	-	-	Continue CAT1
	2-k8 weeks	Yes	Positive	-	One extra month intensive phase on CAT1
			Negative	-	Continue CAT1
	>8 weeks	Yes	Positive	Treatment after default	Start on CAT2
			Negative	Treatment after default	Continue CAT1

> two months	< 2 weeks	No -	-	-	Continue CAT1
	2-8 weeks	Yes	Positive	Other	Start on CAT2
			Negative	-	Continue CAT1
	>8 weeks	Yes	Positive	Treatment after default	Start on CAT2
			Negative	Treatment after default	Continue CAT1

NB*: A patient must complete all 60 doses of the initial intensive phase. For example, if a patient has to continue his previous treatment and he took one month of treatment (30 doses) before interrupting, he will have one more month (30 doses)of the intensive phase to take. He will then start the continuation phase of treatment.

NB**: A patient who must start again on CAT1 will restart from the beginning.

[+] National Tuberculosis Control Program, Kingdom of Saudi Arabia

Treatment for relapse and failure cases who interrupted treatment[+]

Length of treatment	Length of interrupted	Do a smear	Result of smear	Register again	Treatment
< one month	< 2 weeks	No	-	-	Continue CAT2*
	2-8 weeks	No	-	-	Start again On CAT2
	>8 weeks	Yes	Positive	Treatment after default	Start again on CAT2
			Negative	Treatment after default	Continue CAT2
1-2 months	<2 weeks	No	-	-	Continue CAT2
	2-k8 weeks	Yes	Positive	-	One extra month intensive phase on CAT2
			Negative	-	Continue CAT2
	>8 weeks	Yes	Positive	Treatment after default	Start again on CAT2
			Negative	Treatment after default	Continue CAT2

> two months	< 2 weeks	No -	-	-	Continue CAT2
	2-8 weeks	Yes	Positive	Other	Start again on CAT2
			Negative	-	Continue CAT2
	>8 weeks	Yes	Positive	Treatment after default	Start again on CAT2
			Negative	Treatment after default	Continue CAT2

Note: * A patient must complete all 90 dose of the initial intensive phase

+ National Tuberculosis Control Program, Kingdom of Saudi Arabia

Malaria

Definition:

Malaria is a parasitic disease caused by four species of Plasmodium (P. vivax, P. malariae, P. ovale and P. falciparum)

Epidemiology:

- Malaria is responsible for the death of 1.5-2.7 millions in sub tropical countries every year.
- About 300-500 million people are affected by malaria every year.
- Transmission of malaria occurs by the bite of an infective female anopheles mosquitoe.
- Vectors have biting peaks at midnight and early morning.
- Incubation period varies depending on the species (7-14 day for falciparum, ovale, and vivax) and (7-30 days) for P. malariae.
- Incidence of malaria increases after the rainy seasons.

Diagnosis:

Symptoms:

- Malaria patient typically presents with attacks of sequentially chills, fever, and sweating over 4-6 hours.
- Other symptoms include headache, fatigue, generalized body-ache, dizziness, nausea, anorexia and diarrhea.
- Occurrence of attack depends upon the species; every other day in P.vivax and P.ovale, or P.falciparum and every third day in P.malariae.

Signs:

- High temperature.
- Splenomegaly.
- Hepatomegaly.
- Jaundice.

- Pallor.

Laboratory Findings:

- Thick film and thin film for malaria should be requested.
- Thin film is used to identify the species of malaria.
- If diagnosis is suspected and the first result of blood film is negative, it should be repeated every eight hours for three consecutive days.

Management

Chloroquine sensitive areas:

- 10 mg/kg as starting dose.
- 5 mg/kg after 6 hour.
- 5 mg/kg after 24 hour of the initial dose.
- 5 mg/kg after 48 hour of the initial dose.

Chloroquine resistant areas:

- Quinine sulphate 10 mg/kg TID for 3-7 days plus any of the following:
  - Doxycycline 100 mg BID for seven days.
  - Clindamycin 900 mg TID for 3 days.
  - Fansidar 1500 mg once.
- Mefloquine 15 mg/kg once.

Severe Malaria:

Malaria is considered as severe if it is associated with any of the following manifestations (complicated malaria):

- Mental disturbance, neurological signs, convulsion, delirium, coma→ cerebral malaria.
- Hyperpyrexia.
- Hemolytic anemia.
- Non-cardiogenic pulmonary edema.
- Acute renal failure.
- Marked jaundice with high liver enzymes.
- Hypoglycemia.
- Arrhythmias.

- Secretary diarrhea and dysentery.
- Electrolyte imbalance.
- ≥20% parasitemia.
- Retinal bleeding.

Management of severe malaria:

- Severe malaria is a medical emergency.
- Severe malaria needs urgent hospitalization, intensive care and starting of intravenous anti-malarial medications.
- Quinine 20 mg/kg diluted in (500 ml normal saline) given I.V. slowly over 4 hours.
- 10 mg/kg after 8 hours and then 5 mg/kg every 8 hours till the patient takes medication orally.
- Start intravenous fluid.
- Monitor vital signs, electrolyte and blood sugar.

Prevention of Malaria:

Personal Preventive Measures:

- Clothing should cover all the body.
- Mosquito repellent should be applied to the exposed areas every four hours.
- Use mosquito bed nets.
- Use insecticide spray to kill mosquitoes.

Using chemoprophylaxis:

- Chloriquine sensitive areas:
  - Chloroquine 500 mg weekly, start one week before traveling till four weeks after leaving the endemic areas.

- Chloroquinne resistant areas:
  - Mefloquine 250 mg weekly one week before traveling and then weekly till four weeks after leaving the endemic areas.

  or

- Doxycyclin 100 mg OD for two days before entry into the endemic areas and continue while being there and for four weeks after leaving the endemic areas.

Reporting to the local health authority.

Encourage sanitary improvements (e.g. filling and draining areas of impounded water that will result in permanent elimination of anopheline breeding habitats.

Guidelines for Treatment of Malaria, CDC (USA)

Clinical Diagnosis/ Plasmodium species	Region Infection Acquired	Recommended Drug and Adult Dose1,7	Recommended Drug and Pediatric1,7 Dose *Pediatric dose should NEVER exceed adult dose*
Uncomplicated malaria/P. falciparum or Species not identified If "species not identified" is subsequentlly diagnosed as *P. vivax* or *P ovale*: see *P. vivax* and *P ovale* (below) re. treatment with primaquine	**Chloroquine-sensitive** (Central America west of Panama Canal; Haiti; the Dominican Republic; and most of the Middle East **Chloroquine-resistant or unknown resistance1** (All malarious region except those specified as chloroquine-sensitive listed in the box above. Middle Eastern countries with chloroquine-resistant P. *falciparum* include Iran, Oman, Saudi Arabia, and Yemen. Of note, infections acquired in the Newly Independent States of the former Soviet Union and Korea to date have been uniformly caused by P. vivax and should therefore be treated as chloroquine-sensitive infections).	**Chloroquine phosphate (AralenTM and generics)** 600 mg base (=1,000 mg salt) po immediately, followed by 300 mg base (=500 mg salt) po at 6, 24, and 48 hours Total dose: 1,500 mg base (=2,500 mg salt)	**Chloroquine phosphate (AralenTM and generics)** 10 mg base/kg po immediately, followed by 5 mg base/kg po at 6, 24, and 48 hours Total dose: 25 mg base/kg

	A. Quinine sulfate2 plus one of the following: Doxycycline, Tetracycline, or Clindamycin **Quinine sulfate:** 542 mg base (=650 mg salt) po tid x 3 to 7 days **Doxyxyxline:** 100 mg po bid x 7 days **Tetracycline:** 250 mg po qid x 7 days **Clindamycin:** 20 mg base/kg/day po divided tid x 7 days	**A. Quinine sulfate2 plus one of the following: Doxycycline3, Tetracycline3 or Clindamycin** **Quinine sulface:** 8.3 mg base/kg (=10 mg salt/kg) pot id x 3 to 7 days **Doxycycline:** 4 mg/kg/day po divided bid x 7 days **Tetracycline:** 25 mg/kg/day po divided qid x 7 days **Clindamycin:** 20 mg base/kg/day po divided tid x 7 days
	B. Atovaquone-proguanil (MalaroneTM)4 **Adult tab = 250 mg atovaquone/100 mg proguanil** 4 adult tabs po qd x 3 days	**B. Atovaquone-proguanil (MalaroneTM)4** **Adult tab = 250 atovaquone/100 mg proguanil** **Peds tab = 62.5 atovaquone/25 mg proguanil** 5 – 8 kg: 2 peds tabs po qd x 3 d 9 -10kg: 3 peds tabs po qd x 3 d 11- 20kg: 1 adult tab po qd x 3 d 21- 30kg: 2 adult tabs po qd x 3d 31- 40kg: 3 adult tabs po qd x 3d >40kg: 4 adult tabs po qd x 3d
	C. Mefloquine (LarianTM and generics)5 684 mg base (=750 mg salt) po as initial dose, followed by 456 mg base (=500 mg salt) po given 6-12 hours after initial dose Total dose = 1,250 mg salt	**C. Mefloquine (LariamTM and generics)5** 13.7 mg base/kg (=15 mg salt/kg) po as initial dose, followed by 9.1 mg base/kg (=10 mg salt/kg) po given 6-12 hours after initial dose Total dose = 25 mg salt/kg

Uncomplicated malaria/ *P. malariae*	**All regions**	**Chloroquine phosphate:** treatment as above	**Chloroquine phosphate:** Treatment as above

[1]Note: There are three options (A,B, or C) available for treatment of uncomplicated malaria caused by chloroquine-resitant P. falciparum. Options A and B are equally recommended. Because of a higher rate of severe neuropsychiatric reactions seen at treatment doses, we do not recommend option C (mefloquine) unless options A and B cannot be used. For option A, because there is more data on the efficacy of quinine in combination with doxycycline or tetracycline, these treatment combinations are generally preferred to quinine in combination with clindamycin.

[2] For infections acquired in Southeast Asia, quinine treatment should continue for 7 days. For infections acquired in Africa and South America, quinine treatment should continue for 3 days.

[3] Doxycycline and tetracycline are not indicated for use in children less than 8 years old. For children less than 8 years old with chloroquine-resistant *P. falciparum*, quinine (given alone for 7 days or given in combination with clindamycin) and atovaquone-proguanil are recommended treatment options; mefloquine can be considered if no other are available. For children less than 8 years old with chloroquine-resistant P. vivax, quinine (given alone for 7 days) or mefloquine are recommended treatment options. If none of these treatment options are available or are not being tolerated and if the treatment benefits outweigh the risks, doxycycline or tetracycline may be given to children less than 8 years old.

[4] Give atovaquone-proguanil with food. If patient vomits within 30 minutes of taking a dose, then they should repeat the dose.

[5] Tretament with mefloquine is not recommended in persons who have acquired infections from the Southeast Asian region of Burma, Thailand, and Cambodia due to resistant strains.

Clinical Diagnosis/ Plasmodium species	Region Infection Acquired	Recommended Drug and Adult Dose[1,7]	Recommended Drug and Pediatric[1,7] Dose *Pediatric dose should NEVER exceed adult dose*
Umcomplicated malaria/ *P. vivax or* *P. ovale*	**All regions**[7-] Note: for suspected chloroquine-resistant *P. vivax*, see row below	**Chloroquine phosphate plus Primaquine phosphate**[6] **Chloroquine phosphate:** Treatment as above **Primaquine phosphate:** 30 mg base po qd x 14 days	**Chloroquine phosphate plus Primaquine phosphate**[6] **Chloroquine phosphate:** Treatment as above Primaquine phosphate: 0.5 mg base/kg po qd x 14 days
Uncomplicated malaria/ P. vovax	**Chloroquine-resiatnt**[7] (Papua New Guinea and Indonesia)	**A. Quininesulfate**[2] **plus either Doxycycline or tetracycline plus Primaquine phosphate**[6] **Quinine sulfate:** Treatment as above **Doxycycline or Tetracycline:** Treatment as above **Primaquine phosphate:** Treatment as above	**A. Quininesulfate**[2] **plus either Doxycycline**[3] **or tetracycline**[3] **plus Primaquine phosphate**[6] **Quinine sulfate:** Treatment as above **Doxycycline or Tetracycline:** Treatment as above **Primaquine phosphate:** Treatment as above
		B. Mefloquine plus Primaquine phosphate[6] **Mefloquine:** Treatment as above **Primaquine phosphate:** treatment as above	**B. Mefloquine plus Primaquine phosphate**[6] **Mefloquine:** Treatment as above **Primaquine phosphate:** treatment as above

Uncomplicated malaria: alternatives for pregnant women[8,9,10,11]	**Chloroquine-sensitive**[11] (see uncomplicated malaria section above for chloroquine-sensitive *Plasmodium* species by region)	**Chloroquine phosphate:** Treatment as above	**Not applicable**
	Chloroquine resistant P. falciparum[8,9,10] (see uncomplicated malaria sections above for regions with known chloroquine resistant *P. falciparum*)	**Quinine sulfate**[2] **plus Clindamycin** **Quinine sulfate:** Treatment as above **Clindamycin:** Treatment as above	**Not applicable**
	Chloroquine-resistant P. vivax[8,9,10,11] (see uncomplicated malaria sections above for regions with chloroquine-resistant *P. vivax*)	**Quinine sulfate** **Quinine sulfate:** 650 mg salt pot id x 7 days	**Not applicable**

[6] Primaquines used to eradicate any hypnozoite forms that may remain dormant in the liver, and thus prevent relapses, in P. vivax and P. ovale infections. Because primaquine can cause hemolytic anemia in persons with G6PD deficiency, patients must be screened for G6PD deficiency prior to starting treatment with primaquine. For persons with borderline G6PD deficiency or as an alternate to the above regimen, primaquine may be given 45 mg orally one time per week for 8 weeks; consultation with an expert in infectious disease and/or tropical medicine is advised if this alternative regimen is considered I G6PD-deficiency persons. Primaquine must not be used during pregnancy.

[7] NOTE: There are two options (A or B) available for treatment of uncomplicated malaria caused by chloroquine-resistant *P. vivax*. High treatment failure rates due to chloroquine-resistant *P. vivax* have been well documented in Papua new Guinea and Indonesia. Rare case reports of chloroquine-resistant P. vivax have also been documented in Burma (Myarnmar), India, and Central and South America. Persons acquiring P. vivax infections outside of Papua New Guinea or Indonesia should be started on chloroquine. If the patient does not respond, the treatment should be changed to a chloroquine -resistant P. vivax regimen and CDC should be notified (Malaria Hotline number listed above). For treatment of chloroquine-resistant *P. vivax* infections, options A and B are equally recommended.

[8] For pregnant women diagnosed with uncomplicated malaria caused by chloroquine-resistant P. falciparum or chloroquine-resistant P. vivax infection, treatment with doxycycline or tetracycline is generally not indicated. However, doxycycline or tetracycline may be used in combination with quinine (as recommended for non-pregnant adults) if other treatment options are not available or are not being tolerated, and the benefit is judged to outweigh the risks.

[9] Because there are no adequate, well-controlled studies of atovaquone and/or proguanil hydrochloride in pregnant women, atovaquone-proguanil is generally not recommended for use in pregnant women. For pregnant women diagnosed with uncomplicated malria caused by chloroquine-resistant *P. falciparum* infection, atovaquone-

proguanil may be used if other treatment options are not available or are not being tolerated, and if the potential benefit is judged to outweigh the potential risks. There are no data on the efficacy of atovaquone-proguanil in the treatment f chloroquine resistant *P. vivax* infections.

[10]Because of a possible association with mefloxquine treatment during pregnancy and an increase in stillbirths, mefloquine is generally not recommended for treatment in pregnant women. However, mefloquine may be used if it is the only treatment option available and if the potential benefit is judged to outweigh the potential risks.

[11]For P. vivax and P. ovale infections, primaquine phosphate for radical treatment of hypnozoites should not be given during pregnancy. Pregnancy with *P. vivax* and *P. ovale* infections should be maintained on chloroquine prophylaxis for the duration of their pregnancy. The chemoprophylactic dose of chloroquine phosphate is 300 mg base (=500 mg salt) orally once per week. After delivery, pregnant patients who do not have G6PD deficiency should be treated with primaquine.

Clinical Diagnosis/ Plasmodium species	Region Infection Acquired	Recommended Drug and Adult Dose1,7	Recommended Drug and Pediatric1,7 Dose *Pediatric dose should NEVER exceed adult dose*
Severe malaria12,13,12,15	**All regions**	**Quinidine gluconate13 plus one of the following: Doxycycline, Tetracycline, or Clindamycin** **Quinidine gluconate:** 6.25 mg base/kg (=10 mg salt/kg) loading dose IV over 1-2 hrs, then 0.0125 mg base/kg/min (=0.02 mg salt/kg/min) continuous infusion for at least 24 hours. Analternative regimen is 15 mg base/kg (=24 mg salt/kg) loading dose IV infused over 4 hours, followed by 7.5 mg base/kg (=12 mg salt/kg) infused over 4 hours every 8 hours, starting 8 hours after the loading dose (see package insert). Once parasite density <1% and patient can take oral medication, complete treatment with oral quinine, dose as above. Quinine/quinine course = 7 days in Southeast Asia; = 3 days in Africa or South America. **Doxycycline:** Treatment as above. If patient not able to take oral medication, give 100 mg IV every 12 hours and then switch to oral doxycycline (as above) as soon as patient can take oral medication. For IV use, avoid rapid administration. Treatment course = 7 days. **Tetracycline:** Treatment as above **Clindamycin:** Treatment as above. If patient not able to take oral medication, give 10 mg base/kg loading dose IV followed by 5 mg base/kg IV every 8 hours. Switch to oral clindamycin (oral dose as above) as soon as patient can take oral medication. For IV use, avoid rapid administration. Treatment course = 7 days.	**Quinidine gluconate13 plus one of the following:** **Doxycycline3, Tetracycline3, or Clindamycin** **Quinidine gluconate:** Same mg/kg dosing and recommendations as for adults. Doxycycline: Treatment as above. If patient not able to take oral medication, may give IV. For children <45 kg, give 4 mg/kg IV every 12 hours and then switch to oral doxycycline (dose as above) as soon as patient can take oral medciation. For children ≥45 kg, use same dosing as for adults. For IV use, avoid rapid administration. Treatment course = 7 days. Tetracycline: Treatment as above Clindamycin: Tretament as above. If patient not able to take oral medication, give 10 mg base/kg IV every 8 hours. Switch to oral clindamycin (oral dose as above) as soon as patient can take oral medciation. For IV use, avoid rapid administration. Treatment course = 7 days.

[12] Persons with a positive blood smear OR history of recent possible exposure and no other recognized pathology who have one or more of the following clinical criteria (impaired consciousness/coma, severe normocytic anemia, renal failure, pulmonary edema, acute respiratory distress syndrome, circulatory shock, disseminated intravascular coagulation, spontaneous bleeding, acidosis, hemoglobinuria, jaundice, repeated generalized convulsions, and/or parasitemia of >5%) are considered to have manifestations of more severe disease. Severe malaria is practically always due to *P. falciparum*.

[13] Patients diagnosed with severe malaria should be treated aggressively with parenteral antimalarial therapy. Treatment with IV quinidine should be initiated as soon as possible after the diagnosis has been made. Patients with severe malaria should be given an intravenous loading dose of quinidine unless they have received more than 40 mg/kg of quinine in the preceding 48 hours or if they have received mefloquine within the preceding 12 hours. Consultation with a cardiologist and a physician with experience treating malaria is advised when treating malaria patients with quinidine. During administration of quinidine blood pressure monitoring (for hypotension) and cardiac monitoring (for widening of the QRS complex and/or lengthening of the QTc interval) should be monitored continuously and blood glucose (for hypoglycemia) should be monitored periodically. Cardiac complications, if severe, may warrant temporary discontinuation of the drug or slowing of the intravenous infusion.

[14] Consider exchange transfusion if the parasite density (i.e parasitamia) is > 10% OR if the patient has altered mental status, non-volume overload pulmonary edema, or renal complications. The parasite density can be estimated by examining a monolayer of red blood cells (RBCs0 on the thin smear under oil immersion magnification. The slide should be examined where the RBCs are ore or less touching (approximately 400 RBCs per field). The parasite density can be estimated from the percentage of infected RBCs and should be monitored every 12 hours. Exchange transfusion should be continued until the parasite density is <1% (usually requires 8-10 units). IV quinidine administration should not be delayed for an exchange transfusion and can be given concurrently throughout the exchange transfusion.

[15] Pregnant women diagnosed with severe malaria should be treated aggressively with parenteral antimalarial therapy.

Part IV

Important Related Topics

Part IV

Important Related Topics

Contents

Learning and Teaching in Family Medicine

Learning is the acquisition of *knowledge*, *skills* and *attitudes*. While *teaching* is imparting knowledge, training skills and trying to change attitude of learner. Learning is essentially an active process whereas teaching is eventually passive.

Opportunities to learn and teach in Family Medicine

Formal learning and teaching:

- Postgraduate programs.
- Courses in family medicine.
- Conferences.
- Continuing medical education.

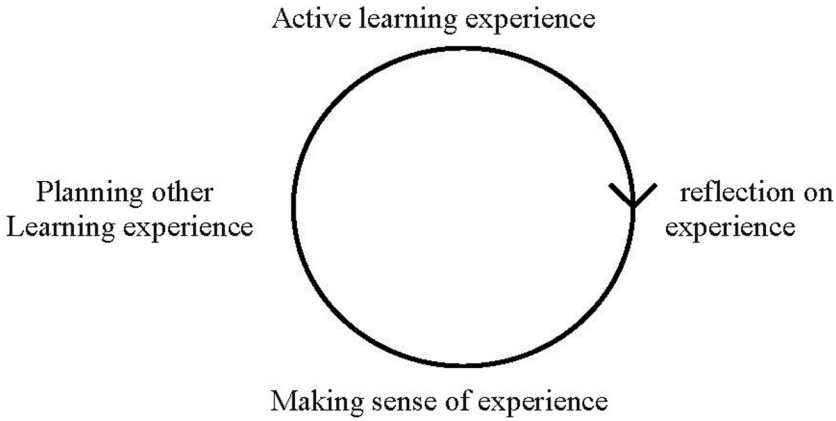
Informal learning and teaching group learning:

- Group discussion in a health center, family practice settings.
- Meetings with colleagues.
- Meeting with health team.
- Health education sessions.
- Family medicine clubs.

Individual learning in the practice:

- Consultation with patients.
- Consultation with specialist.
- Consultation with health team.
- Consultation with colleagues.
- Medical records.
- Audit.
- Prescription writing.
- Follow up of patients.
- Special procedures (ECG training).

The learning cycle in practice



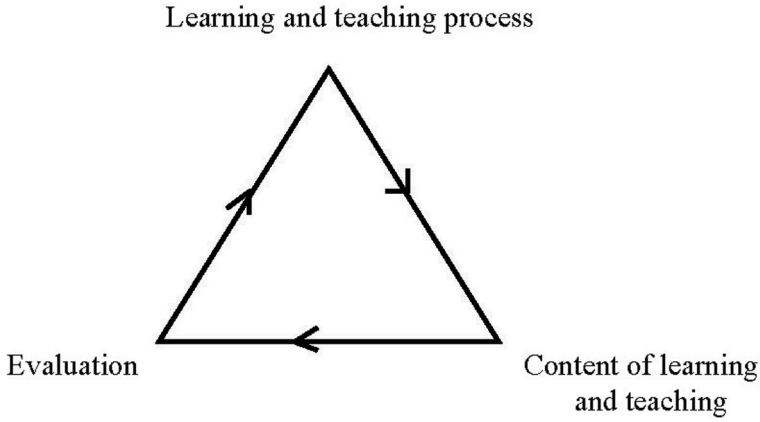
Individual learning outside the practice:

- At patient's home.
- Nursing homes.
- Family life.
- Outside interests.
- Financial status.
- Research.
- Internet facilities.

Teaching Methods

- Lecture.
- Group discussion.
- Video tapping.
- Sitting with consultants.
- Sitting of consultant with trainees.
- Audio tapes.
- Internet facilities.
- Seminar.

Arms of learning and teaching in family medicine



Outcome of learning and teaching:

- Acquisition of knowledge and updating this information continuously.
- Gaining more experience and skills in practical issues to be used in family medicine.
- Change of attitude of the learner to the one in conformity with the profession.
- Upgrading of professional values related to specialty.
- Satisfaction of both the learner and the public.
- Improvement of quality of health services.

Principles and Concepts of Epidemiology in Family Practice

Epidemiology is a medical term which means:

Epi-	= Upon.
Demos-	= People.
Logy	= Science.

Definition:

Epidemiology is defined as the study of health related phenomena concerning distribution and determinants of health related problems among human beings.

Components of Epidemiology

- Disease frequency (incidence, prevalence).
- Distribution of diseases by person, time and place
- Determinants of diseases (risk factors, causes).

Applications of epidemiology:

- Observation & description of the natural history of diseases.
- Classification of diseases.
- Community diagnosis.
- Identification of disease determinants and testing hypothesis (causes and risk factors).
- Providing essential data for planning, implementation and evaluation of health services programs.
- Providing the essential data related to availability of resources, accessibility and utilization of health services.
- Surveillance.

Objectives of epidemiology:

- To promote the health and well-being of the community as a whole.

- To eliminate or reduce the health problems and their consequences.

Sources of epidemiological data:

- Census: a periodic counting of the population of the country (size, sex, age, etc).
- Population Estimates: Using the previous census data (birth, death, migration).
- Vital Records & Registers:
  - Birth Register: (date of birth, sex, place, weight, height, gestational age).
  - Death Register: (date of death, place, age, sex, marital status, job, cause).
  - Notification of Infectious Diseases Register (NIDR).
  - Disease Registers.
  - Hospital Records. (in-patient, out-patient).
  - Morbidity Survey.

Epidemiological approaches:

There are at least two epidemiological approaches:

Question Approach:

The first group of questions should be relevant to the health events. These questions include:

- What is the problem? Name of the problem.
- What is the magnitude of the problem? Size of the problem (incidence and prevalence).
- Where did it happen? Place.
- When did it happen? Time.
- Who were affected? People or group of people affected.
- Why did it happen? (reasons, causes).

The second group of questions should be related to the action taken:

- What can be done to reduce this health problem?

- How this problem can be prevented in the future?
- What action can be done by the community and health sectors?
- For and by whom this action should be carried out?
- What resources are required and how they are organized?
- What difficulties arise and how to overcome?

Making Comparison Approach:

This approach deals with making comparisons between those exposed and those not exposed to the health problem.

Measurements in Epidemiology:

- Measurement of mortality.
- Measurement of morbidity.
- Measurement of disability.
- Measurement of presence, absence of characters (e.g. types of blood group).
- Measurement of medical needs and health care facilities.
- Measurement of health services utilization.
- Measurement of demographic variables (age, sex, marital status, occupation, educational status).

Tools of Measurement in epidemiology:

A. Rate = A/ B X 1000 or X 10,000 or 100,000.

   e.g.: A= Crude Death Rate, B= total number of population at mid-year X 1000.

Types of rates:

- Crude Rate: all and the actual observations.
- Specific Rate: used for specific diseases or age groups ... etc.

B. Ratio: Relationship between two quantities.

e.g.: Ratio of incidence of Diabetes between male and female.= A/B

C. Proportion: Relationship between magnitude of part in relation to magnitude as a whole.
e.g.: Number of children with Diabetes/total number of children at the same time X 100

Vital Indices:

A. Mortality Rates:

1. Crude mortality rate =Number of deaths during year/ mid year population X 1000.

2. Case Fatality Rate = Number of deaths due to disease /Number of affected cases X 100.

3. Crude Birth Rate = Number of births /total number of population X 1000.

4. Infant Mortality Rate = Number of infant deaths below one year / live births X 1000.

5. Maternal Mortality Rate = Total number of deaths due to pregnancy/live births or child birth X 1000.

B. Incidence Rates:

1. Incidence Rate = Number of new cases / total number at risk X 1000.
2. Prevalence Rate = Number of the current cases (old & new) / total population at risk X 1000.
3. Recovery Rate =Number of recovered cases from certain disease /affected cases X 100.

Importance of rates and ratios:

A. They are used as an index for measuring the pathogenicity or virulence of an organism such as case fatality rate.
B. They are used as an index for measuring the ease of communicability of Disease/s (Secondary Attack Rate)
C. They are used for comparing disease frequency and death frequency such as crude death rate, infant mortality rate and maternal mortality rate .
D. They are used to compute the relative risk, odd ratio and Attributable risk (RR, OR, AR).

Important terms and definitions in epidemiology of communicable diseases

Definitions:

Infection*:* is defined as the entry, development and multiplication of an organism in the body of human or animal.

Infectious Disease: is a clinically manifested disease of man or animal resulted from infection.

Contagious Disease: is a disease that is transmitted through contact.

Non-infectious Disease: is a disease that is not due to infectious agents such diabetes and hypertension.

Communicable Disease: is a disease caused by an infectious agent or its toxic product which can be transmitted directly or indirectly or through vectors from the reservoir to a susceptible host.

Contamination: It is the presence of the living infectious agent on the exterior surface of the body or on the clothes or articles of the person or on any object in the environment including food and water.

Epidemic: it is the occurrence of an illness in a community in excess of its normal expectancy.

Endemic: it is an establishment of a disease in a certain community throughout the year.

Pandemic: It is the appearance of a disease in an epidemic form affecting many countries of the world at the same time.

Outbreak: It is a more or less localized epidemic affecting certain large number of a group in the community.

Sporadic: These are scattered cases occuring irregularly and haphazardly from time to time and infrequently.

Noso-comial infection: It is a hospital acquired infection.

Opportunistic infection: it is an infection by an organism that takes the opportunity provided by a defect in the host defense mechanism.

Eradication: It is the extermination of an agent of infection from the whole world.

Period of communicability: It is the time during which the infectious disease can be transmitted from the reservoir to the susceptible host.

Incubation period: It is the interval between exposure to the infectious agents and appearance of symptoms and signs of disease.

Infectious agent: It is the agent responsible for causing infection.

Reservoir: It is the place or depot where the infective agent survives, grows and multiplies in such a manner that can be transmitted to the host.

Requisites for communicable diseases

In order to acquire a communicable disease, most of the following are needed:

- Presence of a microbial agent.
- Presence of a reservoir.
- Portal of exit.
- Mode of transmission.
- Portal of entry.
- Susceptible host.

Mechanisms of disease production (How disease occurs?):

- Invasiveness: (Invasion of tissues & multiplication).
- Toxicity: (Production of toxin).
- Hypersensitivity: (Host allergic state)

Factors affecting disease production in relation to agents:

- Pathogenesis.
- Virulence.
- Period of communicability.
- Dose of infection.
- Host specificity.
- Tissue selectivity.
- Viability of organism.
- Susceptibility of organism to treatment.

Types of reservoirs:

- Man: is the most common reservoir.
- Animals (Zoonosis).
- Plants.
- Soil.

Types of carrier:

- Permanent.
- Chronic.
- Temporary.
- Transient.

Seriousness of carrier state:

- Carriers are not aware about their carrier state.
- Carriers are not clinically manifested.
- The others are not aware about them.
- Carriers are difficult to be discovered or to be dealt with.

Portal of Exit

It is the place from where the infectious agent goes out:

- Respiratory (Measles, Pneumonia).
- Gastrointestinal (Typhoid, Ascaris).
- Uro-genital (Sexual transmitted diseases, Bilharzia).
- Skin & Mucous Membrane (Viral Conjunctivitis).
- Trans-placental (rubella, cytomegalovirus).
- Blood (HIV, Hepatitis-B and C).

Mode of Transmission:

It is the route by which the infective agent is transmitted to a susceptible person.

Importance: Very important for prevention and control of diseases.

Types:

Direct:

Transmission of the infectious agent from the infected individual to the host without third object (Sex, kissing, touching as in hepatitis-B, herpes simplex type 1).

Indirect:

Transmission of the infectious agent from the infected individual to the host through third object (tissues, toys, soiled clothes, towels as in salmonella).

Trans-placental:

Transmission of the infectious agent from the infected individual to the host through placenta (mother to fetus as in toxoplasmosis).

Droplets:

Transmission of the infectious agent from the infected individuals to the host through droplets spray into the mucous membrane of the nose and mouth by:

- Sneezing.
- Coughing.
- Spitting.
- Talking.

Vehicle of transmission:

It is the means or media for transmission of the infectious agent. It includes:

- Water.
- Milk.
- Blood.

It is introduced to the host through:

- Ingestion (Typhoid).
- Inoculation (Hepatitis -B).
- Deposition (Conjunctivitis).

Investigation of an Epidemic

Investigation of any epidemic needed to pass through the following steps:

1. Verify the diagnosis.
2. Confirm the presence of epidemic.
3. Identify the affected persons and their characters.
   a. Case history.
   b. Search for additional cases.
4. Define and investigate the population at risk.
5. Formulate the hypothesis concerning the source and spread of infection.
6. Manage the epidemic:
   a. Treatment of the cases.
   b. Prevent the spread and commence of control measures.
   c. Write report.
   d. Continue surveillance of the population.

7. Experimental verification of the agents causing the diseases and the mode of transmission.

Epidemiological Studies

Strong or weak conclusions of research depend on type of study. As a result, it is very essential for family physicians to be familiar with different types of study designs used in epidemiology.

Types of studies:

Study designs are divided into two major groups:

1. ***Observational Studies.***

2. ***Experimental Studies.***

Observational studies are those studies in which the characteristics or attributes of population are observed without any intervention.

There are four main subtypes of observational studies:

Case series or case report:

They are simple descriptive accounts of describing interesting characters observed such as case reports of patients (e.g. rash in children in a case of Chicken pox.)

Case-Control (Retrospective) Study:

In this type of studies, the investigators begin with the presence or absence of the outcome (disease) and then look backwards in time to find out the possible risk factors or causes.

The **cases** are individuals who were selected on the basis of some diseases or outcomes while the **controls** are individuals **without** disease or outcome.

The history of both Cases & Controls are explored in an attempt to identify a risk factor (e.g. two groups of people, each group consists of 1000 individuals):

The first group: (1000 cases who developed myocardial infarction).

The second group (1000 cases who did not develop myocardial infarction.

We ask all the individuals in both the groups regarding smoking habit.

Basic steps to conduct case control study:

1. Identify the study groups.

2. Write down the criteria for diagnosis and the criteria of inclusion & exclusion.

3. Select the source of cases which could be from:
   - Entire population.
   - Hospitals.

4. Identify controls, which should be:
   - Free from the diseases under the study.
   - Matched with the cases in every item (age, sex, job, etc...) except that for comparison.

5. Select the source of control:
   - General population.
   - Hospitals.
   - Friend members.

6. Analyze the outcome and calculate odd ratio (OR).

   Example: 200 individuals were asked about cough and history of smoking, 100 of them were considered as cases and 100 as controls as mentioned below, what is the odd ratio?

	Having cough	Not having cough	Total
Exposed (smoker)	90(a)	20(b)	110
Not exposed (non-smoker)	10(c)	80(d)	90
Total	100 (a+c)	100(b+d)	200

Odd Ratio (OR) = ad/bc = 90x80/20x10=36.

Cross-Sectional studies (Prevalence Study):

It is an analysis of collected data on a group of individuals at a point of time or over a period of time. These are conducted to know what is occurring now.

Applications:

- Diagnosis of diseases.
- Staging of diseases.
- Screening for diseases.
- Identification of risk factors.

Limitations:

- It is not useful in rare conditions.
- It is difficult to use this type of studies to determine what is responsible for the other (the causes or the outcomes).
- It deals with survivors but not dead individuals.

Cohort (Prospective) Study:

It is an observational study in which a group of persons exposed and a group of persons unexposed to a cause of disease are followed up in time and the incidence of the disease in one group compared with the incidence of the disease in the other group.

In this type of studies:

- Both groups are selected at the same time.

- Both groups are followed for a period of time.
- One of the groups has the risk factor or the cause of the disease while the other group does not have.

e.g: Group -1 (1000 Smokers) → Followed up for a period of time → developed angina or not.

Group -2 (1000 Non-smokers) → Followed for a period of time → developed angina or not.

This type of study is:

a. Very expensive.
b. Takes long time.
c. There is high rate of drop out.
d. Its results are more conclusive than retrospective studies.

Steps to conduct cohort study:

1. Define your study population.
2. Select the target population with the risk factor of a public health interest or importance.
3. Select the comparison group.
4. Obtain data on exposure.
   - From subjects themselves.
   - From medical records.
   - From physical examination.
   - From Lab. investigations.
5. Follow up the cohort.
6. Obtain data on outcome from
   - History.
   - Physical examination
   - Lab. Investigations.
   - Medical records.
7. Calculate the Relative Risk (RR)

Example: 1000 individuals were followed up for 50 years to see if they developed lung cancer or not. 500 out of them were non-smokers, 50

individuals of those with a history of smoking developed lung cancer as compared to 10 individuals of those who did not smoke.

Calculate the relative risk of getting lung cancer.

Exposure	Getting lung cancer	Not getting lung cancer	Total
Smokers	50(a)	450(b)	500(a +b)
Non-smokers	10(c)	490(d)	500(c+d)

Relative Risk (RR): a/(a+b) divided by c/c+d

= (50/500)/ (10/500) = 50/500 x 500/10= 5

Experimental Studies (ES):

Randomized Controlled Trial (RCT):

The most common type of the experimental study is Randomized Controlled Trial (RCT). This type of study starts with two or more groups of individuals who are similar in all aspects other than the intervention. The interventional group is assigned to receive the therapeutic or the preventive measure under the investigation while the control group does not receive any intervention.

In RCT, all the individuals are followed to assess the outcome of interest. The incidence rate of the outcome is compared in both the groups. This type of study is the best design that could minimize bias and confounding.

Types of RCT:

Clinical Trials: In this type of studies, the patients are the subjects (e.g. diabetics).

Field Trial: In this type of studies, the subjects are not patients but members of the general population.

Double Blind Randomized Controlled Trial (DBRCT): Subjects are randomly allocated to either receive the intervention under the test or placebo, and neither the subjects nor the investigators know which subject has received what.

Multi-factorial Trials: In this type of studies, two or more interventions are compared either when applied singly or combined against a comparison group.

This design allows evaluation of interaction between different interventions.

> e.g. degree of metabolic control of diabetes by diet and Glibenclamide VS diet and Metformin VS Diet only VS insulin only.

Crossover Trials: In this type of studies, each subject acts as his own control by receiving at least two treatments (e.g. drug X and drug Y) at different times during the trial.

Between the each intervention, the subject should be in washout period (the period of time
between the first intervention and the second intervention in which no treatment is given) in order to avoid the effect of each intervention on the other(spillover effects).

Before/After Studies: In this type of studies, the rates of risk are compared before the intervention is introduced with the rates after intervention. This design suffers from changes irrespective of the intervention (due to secular trend). This design is commonly used in evaluation of health care services.

Steps of conducting RCT:

1. Formulation of the hypothesis.
2. Specify the objective of the trial.
3. Define the reference and the study population.
4. Select the study population.
5. Select the suitable subjects.
6. Obtain informed consent.
7. Collect data base.
8. Allocate the subjects randomly to intervention and control groups.
9. Follow up both groups.
10. Assess the outcome either continuously or at specific time.
11. Analyze and compare the outcome between the two groups.
12. Interpretation of the results (effect or impact).
13. Give feedback to participants, relevant official bodies and general public.

Biostatistics for Family Physicians

Introduction:

Family physician is one of the medical specialists who deals with biostatistics on daily basis. For this reason, every family physician should have a good back ground of this important field.

Definition:

Biostatistics is defined as a branch of sciences which is concerned with:

a. Data collection
b. Data presentation in biological and medical fields.
c. Data analysis

Types of Data:

Constant Data: Are those observations that do not vary from person to person such as number of eyes, number of ears.
Variables: Are those observations which vary from person to person (e.g. height, weight).

Types of variables:

Continuous, quantitative variables:

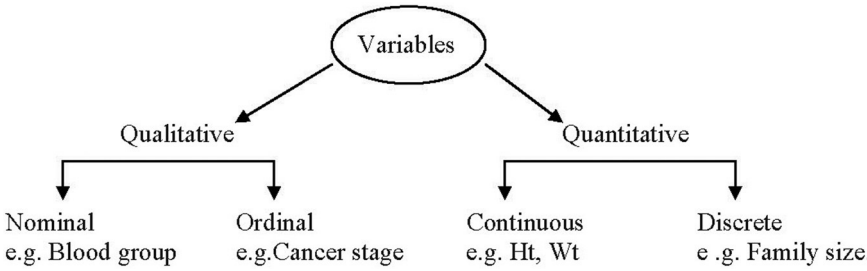
- These variables can be obtained by measurement.
- Their values could be integer or fraction.(e.g. height, weight).

Discrete discontinuous quantitative variables:

- These variables are obtained by enumeration or count.
- Their values are always integer. (e.g. respiratory rate, pulse rate, size of family).

Qualitative variables:

- These variables are expressed in quality.
- These variables can not be measured or counted.
- These variables can not be enumerated.
- These variables can be categorized.(e.g. sex, blood group, educational status).



Data Collection:

Data could be collected by using any one of the following methods:

By carrying out survey of the community through questionnaire which could be:

- Comprehensive survey.
- Sample survey.

Data collection from records which include:

- Population census.
- Primary health care center records.
- Hospital records.
- Outpatient records.
- School health records.
- Birth register and death register.

Data Presentation:

Data could be presented by one of the following methods:

Simple numerical presentation.

This method could be used for small size observations such as weight of five individuals (90 kgs, 81 kgs, 70 kgs, 77 kgs, 50 kgs)

Tabular Presentation.

This method is used for presentation of large number of data.

Types of Tables:

Simple frequency table:

- It consists of two columns (left and right).
- The left column is used for showing variable
- The right column is used for showing the frequency.
- Every table should have:

* A title which should answer three question (what, where, when).
* Source of information should be written below the table if data was obtained from any other source (Table 1).

Table 1. Frequency of patients who attended a family practice according to sex

Sex	**No. (%)**
Male	1350 (49)
Female	1420 (51)
Total	2770 (100)

Table of association:

- It consists of 2 columns and 2 rows.
- It is used to show relationship between two conditions or characters. e.g. relationship between exercise and diabetes .

Table 2. Association between performance of exercise and diabetes.

Exercise	**Diabetes**		**Total**
	Yes (%)	**No (%)**	
Yes	20 (28.5)	5(29)	25
No	50 (71.5)	12(71)	62
Total	70 (100)	17(100)	87

C x R Table:

- There is more than two columns.
- There is more than two rows.

Table 3. Effect of three different drugs on a medical condition.

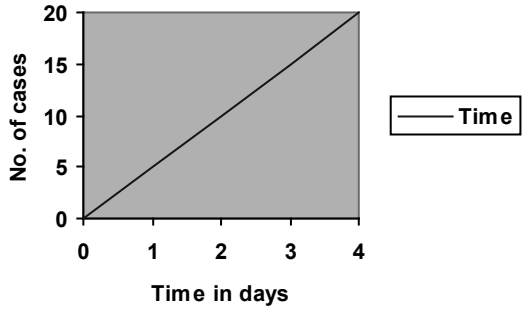
Name of Drug	Results			Total
	Cured (%)	Improved (%)	Died (%)	
X	14(33)	25(60)	3(7)	42(100)
Y	18(46)	20(51)	1(3)	39(100)
Z	18(36)	30(60)	2(4)	50(100)

Graphical Presentation:

Line graph:

- It is used when we deal with an observation in relation to time
- The time is put on the horizontal axis.
- Example of this graph is epidemic curve, temperature curve, birth and death curve.

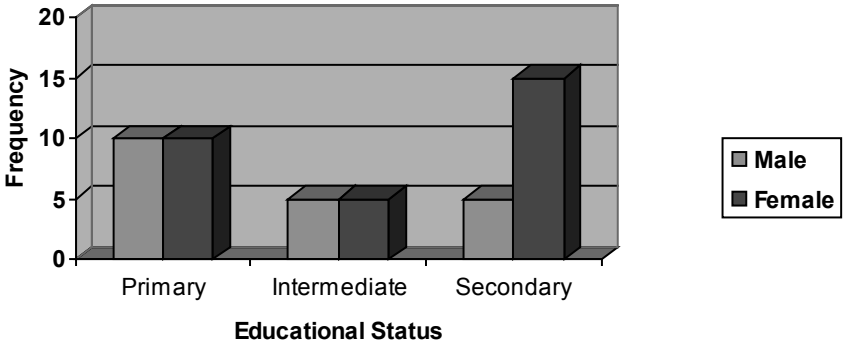
Fig. 1: Number of Hepatitis-A cases during the last four days



Bar Chart:

- It is used to represent data of two subtypes of qualitative and quantitative discrete types.
- All bars must have the same width.
- Each two consecutive bars should be separated by a space.
- The height of the bar corresponds to the frequency.

Fig. 2: Frequency of educational status in a rural area according to sex

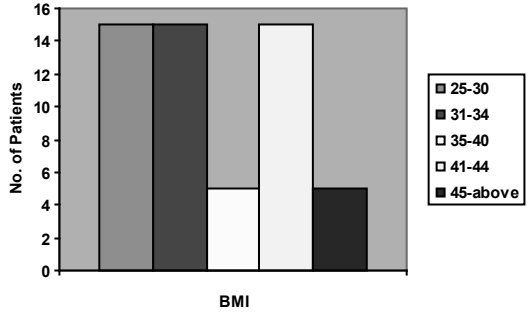


Histogram:

- It is used for continuous quantitative variables of simple table.

- Each category in the table is represented on histogram by a column.
- There is no space between consecutive columns.
- Occasionally in histogram a scale break is used when the lower limit is far from zero on the horizontal axis only.

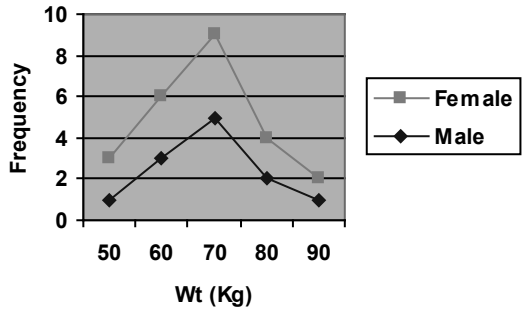
Fig. 3. Distribution of patients according to body mass index



Frequency polygon:

- It is used for continuous quantitative variables.
- Table could be simple or complex.
- Each category on the table is represented by a single pairs on "y" axis.
- Every two consecutive points are joined together by a straight line.

Fig. 4: Frequency Polygon showing weight of patients seen in a clinic according to sex

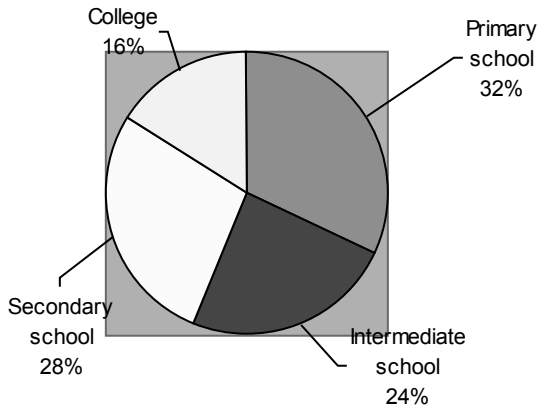


Pie Chart:

- It could be used for all types of variables.
- The circle is divided into sector equal to the number of categories in the table.
- The angle is calculated by using the following equation:

$$\text{Angle} = \frac{\text{Frequency of the interval}}{\text{Total frequency}} \text{ X } 360$$

Fig. 5: Pie chart illustrating the educational status of patients who attended diabetic clinic



Measurement of Central Tendency

Definition:

These are computed values around which most of the observations tend be allocated.These measures are:

- Arithmetic mean.
- Median.
- Mode.

Mean:

- It is the arithmetic average of a set of values.
- It represents the central value of data.
- It is calculated by the following formula:

$$\bar{y} = \sum_{i=1}^{n} \frac{yi}{n} = \frac{\text{sum of all values}}{\text{number of values}}$$

$\bar{y}$ = *mean*: n = *number of observations*; yi = *sample value*; $\sum$ = *summation*

e.g. Six patients waited at the outpatient clinic for 15, 10, 10, 6, 8, 8 minutes.

What is the mean of the time they waited?

$$\bar{y} = \frac{15+10+10+6+8+8}{6} = 9.5 \text{ min}.$$

Advantages of using mean:

- It considers all observations.
- It is the most commonly used measure of central tendency in medical research.

Disadvantages of using mean:

- It is used only in quantitative data.
- It is affected by small and large observations (extremes)

Median:

- It is the value which lies in the middle of the observations after arranging them in ascending or descending manner.

- If the total number of observations is **(Odd):**
  - Arrange the observation in ascending and choose the value in the middle.

e.g. Seven boys have the following weights in (kg):7, 5, 4, 3, 9, 8, 10
Median is (7 kgs).

- If the total number of observations is **(Even)**:
  - Arrange in ascending or descending order.
  - Choose the two observations in the middle.
  - Add these two observations together.
  - Divide the sum of these two observations by 2 to get the median.

e.g. Weight of eight students in kgs. (8, 7, 3, 4, 10, 18, 15, 2)

2, 3, 4,	7, 8,	10, 15, 18

$\frac{7+8}{2} = \frac{15}{2} = 7.5$; Median = 7.5 kgs.

Advantages of median:

- It is useful for skewed data.
- For symmetrical distributed data, it equals the mean.

Disadvantages:

- It is not sensitive to the extreme values.

Mode:

It is the observation which appears more frequently than any other observation.

e.g. Height of 5 students were as following:

135, 130, 135, 140, 120 cm

Mode is = 135 cm.

Advantages of using Mode:

- It is easy to calculate.
- It is not affected by small or large observations.
- It can be used in all types of variables.

Disadvantages of using Mode:

- Sometimes, mode can not be determined as all observations had the same frequency.
- Sometimes there is no mode or more than two modes.
- It does not take in consideration all observations.

Measurements of Dispersion

Use of central tendency measurements is not adequate to describe the data completely, one has to use additional measures that give us some idea about how much the data is scattered or spread. These measurements are known as "Measures of Dispersion".

Range:
It is the difference between the largest and the smallest value in the observations.

e.g. Weight (in kg.) of six children are:7, 8, 13, 3, 10, 4

The range = 13 – 3 = 10 kgs

Standard deviation (SD)

- It is one of the most commonly used measures of dispersion.
- It will measure to which degree (how much) the values spread (close) or (far) from the arithmetic mean.

$$SD = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

How to calculate the SD?

1. Calculate the mean of observations.
2. Find out the difference between each value and mean = $(x - \bar{x})$.
3. Calculate deviation from the mean = $(x - \bar{x})^2$.
4. Use the previous formula to calculate SD.

e.g. Four students have the following weight (kg.)(14, 16, 20, 22)

- Calculate the mean.
- Calculate the SD.

$$\text{Mean} = \frac{14+16+20+22}{4} = \frac{72}{4} = \bar{x} = 18\text{kgs}$$

X	$x-\bar{x}$	$(x-\bar{x})^2$
14	-4	16
16	-2	4
20	+2	4
22	+4	16
$\sum 2$	0	40

$$\text{SD} = \sqrt{\frac{(x-x)^2}{n-1}} = \pm 3.6 \text{ kgs}$$

Normal Distribution

Most of the continuous variables are normally distributed, these variables include height, weight, body mass index …etc. The normal distributed variables can be presented by what is known as" normal distribution curve".

Characteristics of normal distribution curve:

- It is uni-modal (only one peak).
- It is inverted bell (U shaped).
- It is symmetrical.

Hypothesis & Significance Tests

If you want to decide whether males or females have high value of weight, we formulate the hypothesis which states that "There is no difference between both sexes regarding weight".

This hypothesis is known as Null Hypothesis and denoted as H_o.

Any other hypothesis which differs from the given hypothesis is known as alternative hypothesis and denoted as H_1.

- The tests used to decide accepting or rejecting the hypothesis is called tests of significance.
- The test is considered as significant, if its (p - value) is less than 0.05 or 5%.

- The 5% means that there is a probability of 5% that we reject the hypothesis when it should be accepted.

Types of significant tests:

There are many statistical tests that are used in medical practice. The uses of these tests depend on many factors.

1. Type of variable "continuous, qualitative, and quantitative.
2. Distribution of variable (normal or not).
3. Paired or unpaired.
4. Two groups or more.

Table 4. Types of significant tests and their uses in practice

Significant Test	***When to use?***	***Examples***
Z test	When to compare two proportions (%).	Effect of drug – X and drug -Y on controlling diabetes(% who were controlled with drug –X) (and % who were controlled with drug – Y)

t –test (student test)	When to compare two means.	Mean of hemoglobin between males and females.
Paired t-test	When to compare two mean pre and post intervention.	Comparing mean of cholesterol after giving lipid lowering agents.
ANOVA	When to compare more than two groups.	Compare the mean of hemoglobin among Saudis, Yemeni and Egyptians.
Chi-square test	When to find relation or association between two categorical variables.	Relationship between type of diet and grade of obesity.
McNemar test	When to compare between two categorical pre and post intervention.	Effect of diet therapy on diabetic control "pre-diet and post diet vs. control (good or poor).

Samples and Sampling

Introduction:

In most of studies and surveys, it is impossible to make observations on the entire population being studied. So observations should be limited to a sample of individuals.

Definition:

Sample is defined as a part or a set of a defined population.

Reasons for sampling:

- It is impossible to carry out the study on the total population particularly if the number is large.
- If sampling is done properly, the results can be generalized on the entire population.
- Sampling will save time, money and staff.
- Sampling will be free of bias.

Sampling Methods

Simple Random Sampling (S.R.S.)

It is a process of selection in which every individual being studied has an equal chance to be selected.

Steps of doing Simple Random Sampling:

A. Identify all individuals from where the selection will be made:

- From census list.
- Family health records.

B. Each individual should be given a number.

C. Select a certain number by using random number table or by computer.

Systematic Sampling:

It is a process in which every n^{th} individual is selected from a list or from other order.

- Advantages of this method include:

    1. The sample can be drawn without initiating the listing of all persons from whom the selection will be made.
    2. The starting point for selection should be randomly selected.

Steps of carrying out systematic sampling:

1. Determine the total population.
2. Determine the sample size by using tables or computer.
3. Divide the total population by sample size to get N^{th}.
4. Number between 1 and N^{th} is selected randomly.
5. Select every N^{th} consecutively.

Example:

If you have 3,600 students and you want to select 200 students out of them.

$N^{th} = 3600 \div 200 = 18$

So every 18^{th} student is sampled.

So we should select every 18^{th} student

Which one will be the first one from 1-18 is determined randomly?

If by the random selection we get 14^{th}, then the systematic sampling will be 14^{th}, 32^{nd}, 50^{th}, 68^{th},… etc.

Stratified Sampling:

Stratified random sampling is one way in which the population is first divided into relevant subgroups according to one of the characteristics such age, sex, occupation …etc and a random sample is then selected from each subgroup .

Example:

There are 3600 students at school –B, 500 students are less than 10 years and 700 students are between 10-15 years while 2400 students are

between 16-18 years of age. Selection from each age group depends on percentage of each group pertaining to the total number of students. We can use random sampling method to select from each group.

Cluster Random Sampling:
It is a multi-stage process in which the population is divided into clusters and subsets of each cluster is randomly selected.

Example:
Household survey for malnutrition in country X:

↓
City block (cluster) selected randomly.
↓
Member of each households are randomly selected.
↓
X country
↓ Selected randomly.
Southern region
↓ Selected randomly.
Y- City
↓ Selected randomly.
West of Y-city
↓ Selected randomly.
Street number # 31
↓ Selected randomly.
Selected randomly.
↓ Selected randomly.
Household of street # 31
↓ Selected randomly.
Selected randomly.
↓ Selected randomly.
Individual above 15 years old selected randomly.

Writing Research Proposal

Introduction:

In medical practice, we need to do research either to fulfill the requirements for promotion or as an individual interest or for other reasons. Training in most postgraduate programs including family medicine requires every trainee to do a mini-research before appearing at a final board examination.

Definition:

Proposal can be defined as an action plan for doing a research.

Contents:

Each proposal should include the following parts:

- Title of the research.
- Name(s) of the investigators.
- Name(s) of the supervisor(s), advisor(s).
- Reason for submission.

The above items should be written on the title (cover) page.

Body of the research:

This section begins in the second page onwards and includes all the following items:

Introduction:

- Researcher should provide concise and brief informative background about the subject to be studied.
- Researcher should give details about the magnitude of the problem (mortality, morbidity, cost, etc.)
- Rationale, reasons and justifications for conducting the study should be clarified.

- Aims, general and specific objectives of the research should be written in the end of this section.

Materials and Methods:

This section of proposal should answer the following questions:

- Where the study will be conducted? (study areas)
- When the study will be conducted and for how long?(time duration & time table)
- How the study will be conducted (methods and techniques)? (study design, tools & sampling).
- Who will conduct the study (persons, teamwork)?
- How the data will be analyzed and presented?
- How the study will be funded?

The methods should provide the details regarding the following:

Study design:

- Cross sectional.
- Retrospective.
- Prospective.

Study Tools:

- Questionnaire.
- Medical records.
- Others.

Sampling technique:

- Type of sampling.
- Inclusion and exclusion criteria.

Time & Duration of study:

- Schedules.

Data Management:

- How to collect data?
- How to enter data?

- How to analyze data?
- How to present data? Figures, tables, graphs.
- What types of statistical programs and tests to be used? e.g. SPSS.

Ethical and administrative issues:

- Obtaining permission from the concerned authority.
- Obtain consents from the individuals, if needed.
- Keeping data confidential and for the study purposes only.

Budget:

- Self-funded.
- Company- funded.
- Government-funded.

References:

- They should be written in sequential order as appeared in the text.
- They should be written in accordance with Vancouver style.

Appendices:

- Questionnaire or check lists.
- To be attached with the proposal Arabic translation if derived from a foreign language is also desired.

Ten Steps for a Successful Research

1. Define the idea & establish an important question which you would like to answer?
2. Read about the subject by obtaining the relevant literature.
3. How do you want to obtain the answer for your question?
4. List all the available sources for data collection.
5. Refine your question; break down your question into small workable units.
6. Define all terms used.
7. Do pilot study to find out the expected operational problems.
8. If you intend to publish your work, revise your proposal with experts.
9. Write up your results as soon as possible.
10. Select the journal where do you want to publish your work.

Principles of Management and Administration

Definition:

Management is defined as a process of getting things done through others in order to achieve the predetermined objectives.

Characteristics of management:

- It is a social process which depends on and deals with relationship among people.
- It is a process by which the head (manager) coordinates the activities of different people.
- It is a teamwork process and effort.
- It is a system of authority.
- It is a universal process.
- It is needed at all levels of management (high, middle and lower level).
- It is a taught discipline which contains knowledge, rules and regulations.
- It is an integrated process which deals with human and non-human resources.
- It is a science and art which depends upon rules and needs skills to be learnt and practised.
- It is a profession.

Levels of management:

Generally there are three levels of management or administration:

Top (high) level: This level is responsible for planning, establishing rules, regulations and policy making. It is usually represented by the highest authority e.g. ministry.

Middle level: This level is responsible for executing plans partially and supervising the activities, carried out by the lower levels. It is usually represented by directorates.

Lower Level: This level is mainly responsible for executing orders and activities such as activities in different hospital departments and primary health care activities (diabetic care, antenatal care).

Functions of management:

There are many functions of management, some time these functions are also known as elements.

They include:

Planning = Looking ahead.

Determination in advance a line of action by which certain objectives are achieved.

Planning should answer five important questions regarding what should be done:

- What should we do?
- When should we do it?
- Where should we do it?
- Who should do it?
- How should we do it?

Components of planning:

Planning should answer the previous five questions through the following steps:

O = Objectives (determine objectives).
P = Policies (determine rules and regulations).
P = Procedures (how to do it?) (procedures that you need).
P = Programs (sequences of related actions).

S = Schedule (prescribed time tables).
S = Strategy (action plan including the alternative plans).
B = Budget (How much money do you need?).

Organization:

Organization is defined as dividing the work into sections and departments.

It involves allocation of:

- Activities and relationship between all members of the organization.
- Authority.
- Responsibility.

Staffing:

Staffing is defined as providing the organization with adequate, competent and qualified personnel at all levels of the organization.

It involves:

- Recruitment of personnel.
- Selection and replacement of personnel.
- Promotion, transfer, and retirement of personnel.

Directing:

Directing is defined as guiding and supervising the sub-ordinates.

It includes:

- Issuing orders and instructions to the subordinates.
- Interpreting such orders and instructions.
- Guiding and counseling.
- Supervising the work.
- Communicating with subordinates.
- Motivating the subordinates.
- Leading the subordinates.

Co-ordination:

Coordination is defined as unifying and arranging of all actions and efforts of all members of the organization in order to attain the same common objective.

Controlling:

Controlling is defined as guiding somebody in the direction in which one is intended to go. These are the steps that are taken to ensure that the performance of the organization conforms to the plan.

Steps of controlling:

- Establish standards.
- Measuring the work progress.
- Interpret the results.
- Taking the corrective action

Quality Assurance

Introduction:

In family practice, every family physician should perform his/her daily practice in a good way so that the patient receives high quality services with acceptable cost.

To achieve such objective, each practice should have quality assurance system.

Definition:

There are many definitions for quality assurance in health services. However, it could mean:

- Continuous monitoring of pre-determined standards for health care services.
- Doing the right things from the first attempt, and if you do it again it should be better than the first one.

Rationale of quality assurance:

- To protect the community from malpractice.
- To promote high quality health care for population.
- To improve the performance of teamwork.

Goals of quality assurance:

- To increase effectiveness of health services.
- To increase efficiency of health services.
- To maintain good standards for health services.
- To improve outcomes of health services.
- To increase the client's satisfaction.
- To improve cooperation and coordination with other health related sectors.

- To improve the morale and relationship among the members of health team.

Element (Components) of quality assurance:

- Structures: (human and non-human resources).
- Processes: (interaction between human and non-human resources).
- Outcomes: (the products or the results of the processes).

Dimensions of quality:

- Effectiveness
- Efficiency
- Acceptability
- Accessibility
- Equity
- Relevance

Common terms and definitions used in quality assurance:

Criteria:

It is the element which is precise, effective, clear, measurable, and reflect the quality of the activity.

Standard:

It is a criterion which is described by numbers or values. There are two types of standards:

- Internal standards: they are set by the health team in the health setting itself.
- External standard: they are set by another authority outside the health setting.

Characteristics of standard:

- Comprehensive.

- Practical.
- Scientific based.
- Relevant.
- Effective.
- Efficacious.
- Efficient
- Feasible.
- Measurable.

Note: Standards can be modified, substituted, deleted with time.

Outcomes/ products:

These are the changes which are observed in the individuals, community or environment.

e.g. degree of diabetic control (good, poor), degree of client satisfaction (very satisfied, satisfied, not satisfied).

Effectiveness:

It is the degree to which the outcome of the intervention is achieved under the ordinary life circumstances.

Efficacy:

It is the degree to which the outcome of the intervention is achieved under the ideal circumstances.

Efficiency:

It is the relationship between the output (result) and the resources used to deliver the intervention. It indicates the cost of the utilized resources to achieve the desired outcome.

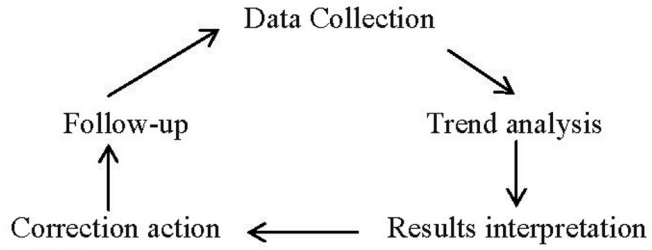
Measuring the quality of outcomes (5 Ds):

- Death rate.

- Disease prevalence or incidence.
- Distress percentage.
- Disability percentage.
- Dissatisfaction rate.

Steps for assessment of quality of health services (see diagram):

- Data collection.
- Data analysis (trends identified).
- Interpretation of results.
- Corrective action.
- Follow-up.



Data Collection includes:

- Determine what data to be collected.
- Determine the sources of data collection (medical records, registers).
- Define the indicators for data collection.

Analysis of trends:

- Identify is it resource? process? or outcome?
- Compare with other practice.
- Identify the degree of achievement of set standards.

Interpretation of results includes:

- Identify the trends.
- Identify the reason for trends.
- Determine the area of weaknesses.

Corrective action includes:

- Define the corrective action.
- Execute the corrective action.

Follow up include:

- Corrective action executed.
- Corrective action achieves the objectives.

- Find association between corrective actions and degree of success.

Clinical Audit

Introduction:

Audit was first described in medical field in 1989. It is defined as:

1. The systematic, critical analysis of the quality of medical care which includes:
   - Used procedures for diagnosis and treatment.
   - Used resources.
   - Outcomes and quality of life.

2. Looking at what do you to improve for better, making appropriate changes and then looking again to assess improvement in clinical practice.

Components of audit:

- Structure e.g. record, drugs and protocols.
- Processes: recording, referring and examining (performance).
- Outcomes: controlled, cured, improved, died, satisfied.

Planning an audit:

1. Choose the audit topic (e. g. diabetes).
2. Agree with your team on criteria and standards (diagnostic criteria, referral criteria).
3. Study the current situation (what is the current situation of diabetic care in your practice (recording, control, referral, rate of complications).
4. Analyze and compare with the standards.
5. Identify causes for not meeting the standards (e.g. poor resources, poor health education).
6. Identify with your team, the changes to be done.
7. Write a plan for implementation (specific and accepted).
8. Implementation of the changes.

9. Re-audit.

Planning for relevant changes needs:

- Team work → brain storming.
- Considering the available resources.
- Agreement on the changes you decide to do
- Write action plan for changes.

Remember that the audit is a cyclic and systematic process

Self-Management in Family Practice

Introduction:

Family physicians are in a critical position to perform many tasks and roles in their own lives and also for others. They are working as clinicians, team leaders, medical educators and sometime managers. In Saudi Arabia, like other parts of the world, family physicians have so many family and social obligations that could disturb their life unless they are good self-managers.

Definition:

Self-management is defined as a process of getting maximum benefit of your time, skills and knowledge in order to achieve your objectives depending on right and valuable system.

Criteria of self management:

- It is a continuous process.
- It depends on using personal resources.
- The objectives are valuable and comply with community values.

Steps of getting success in life:

Step 1. **Understanding of how can you control your life and yourself:**

Most of our life events can be controlled internally (by ourselves). e.g. we cannot control weather changes but we can wear light or heavy clothes.

Step 2. **Understanding the objectives:**

- Those people without clear objectives in their lives have poor feeling and lose concentration in their lives. They are confused without good decision making.

- The important point here is good concentration and clear values.
- You should determine your general objective, personal objectives and occupational objectives for the coming twenty years.
- If you do not write your objectives they remain ideas.

Step 3. **Understanding your personality:**

a. You should have good self-confidence.
   - The person should be clear and direct.
   - The person should be able to control himself if any one wants to disturb his personal plan.
   - Saying "No" when you should say "no".

b. Accept feedback from the others:
   - Do not panic when any one criticizes you.
   - Introduce criticism to others but respect them.
   - Thank people who give you real, and honest feedback.

Step 4. **Understanding of planning:**

Planning is defined as drawing the future on a paper in order to achieve your objectives in the life.

In planning, you need to answer the following questions:

- What will you do? Tasks.
- Who will do the task? Person(s).
- Where will the task be done? Place.
- When will the task be done? Time and duration.
- How the task will be done? Technique and procedures.

Step5. **Understanding the productivity:**

Productivity is the ability to achieve objectives with the best quality and least cost.

Barriers of productivity:

- Sporadic or intermittent performing of task or activity.
- Work overload.

- Ineffective communication.
- Postponing tasks.
- Inability to make decisions at appropriate time.

How to overcome barriers of productivity?

- Refuse strongly but politely to be disturbed by anyone.
- Let others to know that you have time for them, so they can come to you at the appointed time.
- Respect others time.
- Do not disturb the others in their work unless very necessary and ensure that they are not busy.
- Arrange your office, your library, keep good filing system.
- Communicate effectively.
    - Choose the right time and the right media to send your message.
    - Your message should be clear, short, and coherent.
    - Your message to be understood clearly by the receiver.

Postponing

Reason for postponing:

- Fear of failure.
- Fear of success.
- No interest.

How to avoid postponing?

- Use task list to arrange priority.
- Start with the difficult task and finish it to enjoy your day.
- Be organized.
- Consider any task as funny game.

Stages of taking action "Mentality playing)

- Be ready.
- Determine the goal.
- Strike or play the ball.

Self overload:

Self overload is defined as working more than your capability.

How to minimize self overload?

- Concentrate on the important things in your life or work.
- Let others to carry out some tasks "delegation".
- Be flexible.
- Do not change or convert your self into a machine.

Practical points:

- Keep your life easy.
- Keep your objective clear.
- Keep your technique of achieving objectives flexible.
- Keep equilibrium in your life concerning:
  - Relationship.
  - Work.
  - Personal life.
  - Vocational dimension.
  - Family dimension.
  - Value dimension.
  - Spiritual dimension.
  - Financial dimension.
  - Social and psychological dimensions.

Time Management in Family Practice

Introduction:

All of us have equal amount of time (24 hours daily), however the quality of the time depends on how to manage it effectively. Following statement highlights the importance of TIME.

"Time is the wealth, that all of us have equal part of it. We cannot store, save, return it, but we should spend it with a speed of 60 seconds per minute"

Family physicians have tasks, obligations and responsibilities to their work, to their families and community. Unless they plan to manage the time nicely, it will be lost without any benefit.

Definition:

***Time management*:** is defined as a process by which a person tries to get the maximum benefit of time in order to achieve his objectives in life.

How to control your time?

In order to control your time, it is vital to do the following:

- □ Analyze how do you spend your time daily by using a daily note.
- □ After analysis how do you spend your time, determine what are the activities carried out daily and then manage:
  - Importance of the activity weighted on ten point scale (1-10 points).
  - Suitable person to carry out each activity.
  - How the activity can be carried out (procedure)?

What are the advantages of appropriate use of time?

- Planning for future career.
- Updating yourself on your specialty.
- Developing relationship with others.
- Giving yourself time for rest.
- Giving yourself time for thinking.

What is the suitable time for better achievement?

The best time to achieve your objectives is the morning period (6 am-11 a.m.).

How to determine your priorities?

- Make a list that contains the activities that you should do.
- In front of each activity determine their priority by using 10 point scale.
- Carry-out the task according to its priority.
- Delete the task if you have finished it.
- Keep time for emergency.
- Carry out the similar tasks in the same time.
- Ask other people to do some activities which are not essential to be carried out by you.
- To use the time efficiently you should have:
  - Daily plan.
  - Weekly plan.
  - Monthly plan.
  - Annual plan.

Activities could be categorized under four headings according to the importance of their execution (Table)

Important and urgent	Unimportant and Urgent
Important and not-urgent	Unimportant and not-urgent

Factors that affect time management negatively:

Self related:

- Unable to say "no".
- Postponing today's work till tomorrow.
- Much work in order to be perfect.

Environmental related:

- Visitors.
- Telephone calls.
- Waiting for the others.
- Unproductive meetings.
- Unpredicted crisis.

Practical points for effective time management:

- Determine your weekly objectives according to their priorities.
- Establish your daily list of activities which must be done according to priority.
- Concentrate on the most important priorities.
- Deal with each paper, subject once (one time) only.
- Use the new technology for time management (computer, internet, e-mail).
- Remember that every person can save 5-6 hours weekly if he is restricted to the principles of time management.
- If you have problems with time management, please analyze how do you spend your time.
- Priorities in our lives are divided into three groups:
  a. Task must be done (very important) e.g. performing eye surgery for cataract.
  b. Task should be done (important) e.g. visiting your mother.
  c. Task I have interest to do (less important) e.g. playing football.

Stress Management in Family Practice

Introduction:

Due to many factors, family physicians are not an unexception to have stress in their lives .One of the important role of family physicians is to manage their patients who present with stress but they should also know how to manage their own stresses.

Definition:

Stress is defined as a state of personal disturbance due to external or internal factors.

Types of stress:

- Useful stress (which challenges people to produce and to achieve objectives). It could bring happiness, pleasure, etc…
- Harmful stress (bad stress which affects the health of human beings negatively, person feels dissatisfied or negative feeling towards work related issues).

We should look to the stress neutrally. Stress itself is not good or bad but our responses/ reactions to the stress are the determining factor.

Manifestations of stress:

Physiological:

- Headache.
- Backache.
- Fatigue.
- Palpitation.
- Dizziness.
- Muscular pain.

Behavioral:
- Poor concentration.
- Hostility.
- Solid mind.
- Heavy smoking.

Psychological:
- Anxiety.
- Sadness.
- Forgetfulness.
- Guilty.

Social:
- Isolation.
- Loss of relationship.
- Intolerance.
- Keep silent

Causes of stress:

Work related:
- Long working hours (doctors, managers).
- Difficult jobs (surgeons, pilots).
- Difficult supervisors.
- Difficult subordinates.
- Low income jobs.
- Bad work organization.
- Work overload.
- Frequent changes in the work.
- Bad leadership.
- Bad work distribution.
- Team conflicts.

Personality types:
- Bureaucratic.
- Unstable mood.
- Neurotic person.

- Aggressive person.

Family related:

- Caused by husbands/wives.
- Caused by children.
- Home environment.

How to manage stress?

- Identify the symptoms of stress.
- Detect,explore and find out the source/cause of stress
  - Related to work organization.
  - Related to the type of personality.
  - Related to relationship and persons.
- Decide if you are able to change/modify the causes of stress.
- Be ready for change:
  - Change the source of stress.
  - Change the person exposed to stress.
  - Change the reaction between environment and persons.
- Adopt changes.

Part V

Appendices

Part IV

Important Related Topics

Contents

Health Situation in Saudi Arabia in the year 2006 G

A- Demographic indicators:	
Estimated Total Population	23,678,849
Annual Natural increase	2.3%
Population under 5 years	11.6%
Population under 15 years	33.9 %
Population 15-64 years	64.4.18%
Population >=65 years	2.8%
B- Economic indicators	
Gross Domestic Product per capita ($)	14653
MOH budget (% government budget)	6%
MOH expenditure per capita ($)	257
C-Health Resources	
Physician / 10,000 population	20.4
Dentist /10,000 population	2.3
Nurse /10,000 population	35.4
D-Vital indices	
Crude birth rate / 1000 population	24.9 per 1000
Crude death rate /1000 population	4
Life expectancy at birth (years)	73.1
Total fertility rate	3.22
Infant mortality rate /1000 live birth	18.6

Under five mortality rate/1000 live birth	21.7
Maternal mortality rate/10,000 live birth	1.46
E-Health indicators	
Low birth weight < 2.5 kgs	5%
Incidence rate /100,000 population -Polio. -Whooping cough -Measles. -Tetanus. -Tuberculosis	 0 0.14 3.41 0.03 10.88
F-Causes of Mortality	
Non-specific & ill defined conditions	32.2%
Cardiovascular diseases	23.6%
Injury & poisoning	20.1%
Conditions of peri-natal period	6.5%
Neoplasms	2.5%
Diseases of respiratory system	3.1%
Congenital Anomalies	1.4%
Infection & parasite	3.%
Endocrine & Metabolic disorders	2.3%
Diseases of Digestive system	1.8%

The Most Common Ten Diseases among Patients Attending Primary Health Care Setting in Saudi Arabia in the Year 2006G

Rank	**Disease**	**No.**	**%**
1	Acute respiratory infection	11447525	36
2	Musclo-skeletal diseases	2560700	8
3	Gastrointestinal diseases	2426842	7.6
4	Diabetes Mellitus	1748474	5.5
5	Dental and gum diseases	1638685	5.2
6	Diseases of skin and subcutaneous tissues	1547205	4.9
7	Eye diseases	1185765	3.8
8	Hypertension	1156931	3.7
9	Bronchial asthma	871045	2.8
10	Ear diseases	688980	2.2

Laboratory Ranges

Chemistry

Analyte	MGH Unit	SI Unit
Adrenocorticotropin	6.0-76.0 pg/ml	1.3-16.7 pmol/L
Alanine aminotransferase (ALT/SGP)		
Female	7-30 units/L	0.12-0.50 µkat/L
Male	10-55 unit/L	0.17-0.92 µkat/L
Albumin	3.1-4.3 g/dl	31-43 g/L
Aldosterone (adults)		
Supine, normal-sodium diet	2-9 ng/dl	55-250 pmol/L
Upright, normal-sodium diet	2-5 times supine value with normal-sodium diet	
Alkaline phosphatase (adults)		
female	30-100 units/L	0.5-1.67 µkat/L
male	45-115 units/L	0.75-1.92 µkat/L
Alpha-fetoprotein (non-maternal)	<12.8 IU/ml	<9.92 µg/L
Ammonia	12-48 µmol/L	12-48 µmol/L
Amylase	53-123 units/L	0.88-2.05 nkat/L
Angiotensin-converting enzyme		
female	9-25 units/L	0.15-042 µkat/L
male	10-40 units/L	0.17-0.67 µkat/L

Beta2-microglobulin	1.2-2.8 mg/L	1.2-2.8 mg/L
Bicarbonate (HCO3)	22-26 mEq/L	22-26 mmol/L
Bilirubin, direct	0.0-0.4 mg/dl	0-7 µmol/L
Bilirubin, total	0.0-1.0 mg/dl	0-17 µmol/L
C-peptide (adults)	0.5-2.0 ng/ml	0.17-0.66 nmol/L
Calcium	8.5-10.5 mg/dl	2.1-2.6 mmol/L
Calcium, ionized	1.14-1.30 mmol/L	1.14-1.30 mmol/L
Carbon dioxide, partial pressure, arterial (Pa-CO2)	35-45 mm Hg	4.7-6.0 kPa
Carboxyhemoglobin	<5% of total hemoglobin	<0.05 fraction of total hemoglobin saturation
Catecholamines (adults)		
Epinephrine	2-24 µg/24 h	11-121 nmol/24 h
Norepinephrine	15-100 µg/24 h	89-591 nmol/24 h
Total (epinephrine + norepinephrine)	26-121/ µg/L h	142-660 nmol/24 h
Cerebrospinal fluid (adults)		
Albumin	11-48 mg/dl	0.11-0.48 g/L
Cell count	0-5 mononuclear cells/µL	0-5 x 106cells/L
Glucose	50-75 mg/dl	2.8-4.2 mmo/L
IgG	8.0-8.6 mg/dl	0.08-0.086 g/L
Pressure	70-8.6 mg/dl	0.08-0.086 g/L

Protein, lumbar	15-45 mg/dl	0.15-0.45 g/L
Ceruloplasmin	27-50 mg/dl	270-500 MG/l
Chloride	100-108 mmol/L	100-108 mmol/L
Cholesterol		
Desirable	<200 mg/dl	<5.17 mmol/l
Borderline high	200-239 mg/dl	5.17-6.18 mmol/L
High	>239 mg/dl	>618 mmol/L
Cortisol		
Fasting, 8 a.m. – noon	5-25 µg/dl	138-690 nmol/L
Noon – 8 p.m.	5-15 µg/dl	138-414 nmol/L
8 p.m. – 8 a.m.	0-10 µg/dl	0-276 nmol/L
Cortisol, free in urine	20-70 µg/24 h	55-193 nmol/24 h
Creatine kinase (CK)		
Female	40-150 units/L	0.67-2.50 µkat/L
Male	60-400 units/L	1.00-6.67 µkat/L
Creatine kinase isoenzyme index	05-2.5% relative index	None
Creatine kinase isoenzymes, MB fraction	0-5 ng/ml	0-5 µg/L
Creatinine		
Plasma	0.6-15 mg/dl	53-133 µmol/L
Urine	15-25 mg/kg/day	0.13-0.22 mmol/kg/day

Dehydroepiandrosterone (DHEA) (adults)		
Female	130=980 ng/dl	4.5-34.0 nmol/L
Male	180-1250 ng/dl	6.24-43.3 nmol/L
Dehydroepiandrosterone (DHEA) sulfate (adults)		
Female		
Menstruating		
Follicular phase	3.0-20.0 units/L	3.0-20.0 units/L
Ovulatory phase	9.0-26.0 units/L	9.0-26.0 units/L
Luteal phase	1.0-12.0 units/L	1.0-12.0 units/L
Postmenopausal	18.0-153.0 units/L	18.0-153.0 units/L
Male	10-619 µg/dl	100-6190 µkat/L
1.25-dihydroxyvitamin D	18-62 pg/ml	43.2-148.8 pmol/L
Follicle-stimulating hormone (FSH)		
Female		
Menstruating		
Follicular phase	3.0-20.o units/L	3.0-20 units/L
Ovulatory phase	9.0-26.0 units/L	9.0-26.0 units/L
Luteal phase	1.0-12.0 units/L	1.0-12.0 units/L
Postmenopausal	18.0-153.0 units/L	18.0-153.0 units/L
Male	10-619 µg/dl	100-6190 µg/dl
1.25-Dihydroxyvitamin D	18-62 pg/ml	43.2-148.8 pmol/L

Follicle-stimulating hormone (FSH) Female Menstruating		
Follicular phase	3.0-20.0 units/l	3.0-20.0 units/L
Ovulatory phase	9.0-26.0 units/L	9.0-26.0 units/L
Luteal phase	1.0-12.0 units/l	1.0-12.0 units/L
Postmenopausal	18.0-153.0 units/L	18.0-153.0 units/L
Male	1.0-12.0 units/L	1.02-12.0 UNITS/l
Glubulin	2.6-4.1 g/dL	26-41 g/L
Glucose, fasting	70-110 mg/dL	3.9-6.1 mmol/L
Γ-Glutamyltransferase (GGT) Female	1-70 units/L	1-70 units/L
Male	1-94 units/L	1-94 units/L
Growth hormone (resting)	2-5 ng/ml	2-5 µg/L
Hemoglobin A1c	3.8%-6.4%	0.038-0.064
High-desity lipoprotein cholesterol, --- major risk factor	<35 mg/dl	<0.91 mmol/dl
Human chrionic gonadotropin (hCG) (nonpregnant women)	<5 mIU/ml	<5 IU/L
25-Hydroxyvitamin D	8-42 ng/ml	20-105 nmol/L

Insulin	2-20 µunits/ml	14.35-143.5 pmol/L
Ketone (acetone	Negative	Negative
Lactase dehydrogenase (LDH)	110-210 units/L	1.83-3.5 µkat/L
Lipase	3-19 units/dl	0.5-3.17 µkat/L
Lipoprotein (a0	0-30 mg/dl	0-3000 mg/L
Low-density lipoprotein cholesterol	<130 mg/dl	<3.36 mmol/L
Desirable		
Borderline high risk	130-159 mg/dl	3.36-4.11 mmol/L
High risk	≥160 mmol/L	≥4.13 mmol/L
Luteinizing hormone (LH0		
Female		
Menstruating		
Follicular phase	2.0-15.0 units/L	2.0-15.0 units/L
Ovulatory phase	22.0-105.0 units/l	22.0-105.0 units/L
Luteal phase	0.6-19.0 units/L	0.6-19.0 units/L
Postmenopausal	16.0-64.0 units/L	16.0-64.0 units/L
Male	2.0-12.0 units/L	2.0-12.0 units/L
Magnesium	1.4-2.0 mEq/L	0.7-10 mmol/L
Metanephrines		
Metanephrine	45-290 µg/24 h	245-1583 nmol/24 h

Normetanephrine	82-500 µg/24 h	448-2730 nmol/24 h
Total	120-700 µg/24 h	655-3821 nmol/24 h
Microalbumin, random urine	<20 µg/ml	<20 mg/L
5'-Nucleotidase	0-11 units/L	0.02-0.18 µkat/L
Osmolality	280-296 mOsm/ kg of water	280-296 mOsm/ kg of water
Oxygen, Partial pressure, arterial (PaO2) (room air, age dependent)	80-100 mm Hg	10.7-13.3 kPa
Parathyroid hormone	10-60 pg/ml	10-60 ng/L
pH, arterial	7.35-7.45 pH units	7.35-7.45 pH units
Phosphorus, inorganic (adults)	2.6-4.5 mg/dl	0.84-1.45 mmol/L
Potassium	3.4-4.8 mmol/L	3.4-4.8 mmol/L
Prolactin Female Premenopausal Postmenopausal Male	 0-20 ng/ml 0-15 ng/ml 0-15 ng/ml	 0-20 µg/L 0-15 µg/L 0-15 µg/L
Prostate-specific antigen (PSA) Male <40 y ≤40 y	 0.0-2.0 ng/ml 0.0-4.0 ng/ml	 0-20 µg/L 0.0-4.0 µg/L

Prostate-specific antigen (PSA), free; in male 45-75 y, with PSA value between 4 and 20 ng/ml	>255 associated with benign prostatic hyperoplasia	>0.25 associated with benign prostatic hyperplasia
Protein, total	6.0-8.0 g/dl	60-80 g/dl
Renin		
Supine	0.3-3.0 ng/mL/h	0.08-0.83 ng/(L - sec)
Upright	1.0-9.0 mg/mL/h	0.28-2.5 ng/(L – sec)
Sodium	135-145 mmol/L	135-145 mmol/L
Somatomedin C		
16-24 y	182-780 ng/ml	182-780 µg/L
25-39 y	114-492 ng/ml	114-492 µg/L
40-54 y	90-360 ng/mL	90-360 µg/L
>54 y	71-290 ng/ml	71-290 µg/L
Testosterone, total		
Female	6-86 ng/dl	0.21-2.98 nmol/L
Male	270-1070 ng/dl	9.36-37.10 nmol/L
Testosterone, unbound		
Female		
20-40 y	0.-31 pg/ml	20.8-107.5 pmol/L
41-60 y	0.4-2.5 pg/mL	13.9-86.7 pmol/L
61-80 y	0.2-2.0 pg/mL	6.9-69.3 pmol/L
Male		
20-40 y	15-40.0 pg/mL	520-1387 pmol/L

41-60 y	13.0-35.0 pg/mL	451-1231 pmol/L
61-80 y	12.0-28.0 pg/mL	416-971 pmol/L
Thyroglobulin	0-60 ng/ml	0-60 µg/L
Thyroid hormone-binding index	0.77-1.23	0.77-1.23
Thyroid-stimulating hormona	0.5-5.0 µU/ml	0.5-5.0 µU/ml
Thyroxine, total (T4)	4.5-10.9 µU/dl	58-140 nmol/L
Transferin	191-365 mg/dl	1.91-3.65 g/L
Triglycerides (fasting)	40-150 mg/dl	0.45-1.69 mmol/L
Tri-idothyronine, total (T3)	60-181 ng/dl	0.92-2.78 nmol/L
Ponin I	<0.6 ng/ml	<0.6 µg/L
Urea nitrogen (BUN) adults)	8-25 mg/dl	2.9-89 mmol/L)
Eric acide		
Female	2.3-6.6 mg/dl	137-393 µmol/L
Male	3.6-85 mg/dl	214-506 µmol/L
Urinalysis		
pH	5.0-9.0	5.0-9.0
Specific gravity	1.001-1.035	1.001-1.035
Urine sediment		
White cells	0-2/hpf	0-2/hpf
Red cells	0-2/hpf	0-2/hpf
Xylose	4-9 g/5 h	4-9 g/5 h

Toxicology and Therapeutic Drug Monitoring

Analyte	MGH Unit	SI Unit
Acetaminophen, toxicity	>120 µmol/L at 2-4 h	>120 µmol/L at 2-4 h
Amikacin Trough	1.7 µg/ml	1.7 µmol/L
Peak	15-25 µg/ml	26-43 µmol/L
Carbamazepine (adults)	4-12 µg/ml	17-51 µmol/L
Digoxon	0.9-2.0 ng/ml	1.2-2.6 nmol/L
Ethanol	>1000	1 g/L
Gentamicin Trough	<2.1 µg/ml	<4.4 µmol/L
Peak	4-8 µg/ml	8.4-16.7 µmol/ml
Lithium	0.5-1.5 mmol/L	0.5-1.5 mmol/L
Phenobarbital	15-50 µg/ml	65-216 µmol/L
Phenytoin	5-20 µg/ml	20-79 µmol/L
Salicylate intoxication	>500 mg/L	>3.62 mmol/L
Theophylline	10-20 µg/ml	56-111 µmol/L
Tobramycin Trough	<2.0 µg/ml	<4.3 µmol/L
Peak	4.0-8.0 µg/ml	8.6-17.1 µmol/L
Valproic acid	50-100 µg/ml	347-693 µmol/L
Vancomycin Trough	<10.1 µg/ml	<7.0 µmol/L
Peak (2 hours postinfusin)	18-26 µg/ml	12-18 µmol/L

Immunology

Analyte	**MGH Unit**	**SI Unit**
Alpha1-antitrypsin (adults)	76-189 mg/dl	0.76-1.89 g/L
Antiglomerular basement membrane antibodies Qualitative	Negative	Negative
Quantitative	<5 units/mL	<5 kU/L
Antineutrophil cytoplasmic Autoantibodies, cytoplasmic (C-ANCA) Qualitative	Negative	Negative
Quantitative (antibodies to proteinase 3)	<2.8 units/ml	<2.8 kU/L
Antineutrophil cytoplasmic Autoantibodies, perinuclear (P-ANCA) Qualitative	Negative	Negative
Quantitative (antibodies to myeloperoxidase)	<1.4 units/ml	<1.4 k units/L
Autoantibodies Antiadrenal antibody	Negative at 1:10 dilution	NA
Anti-double-stranded (native)DNA	Negative at 1:10 dilution	NA
Antigranulocyte antibody	Negative	NA

Anti-Jo-1 antibody	Negative	NA
Anti-La antibody	Negative	NA
Antimitochondrial antibody	Negative	NA
Antinuclear antibody	Negative at 1:40 dilution	NA
Antiparietal-cell antibody	Negative at 1:20 dilution	NA
Anti-Ro antibody	Negative	NA
Anti-RNP antibody	Negative	NA
Anti-Sci-70 antibody	Negative	NA
Anti-smith antibody	Negative	NA
Antismooth-muscle antibody	Negative at 1:20 dilution	NA
Antihyroglobulin antibody	Negative	NA
Antithyroid antibody	<0.3 IU/ml	<0.3 kIU/L
Bence Jones protein	None detected	NA
Qualitative	None detected in a 50-fold concentration	NA
Qualitative Kappa	<2.5 mg/dl	<0.03 g/L
Lambda	<5.0 mg/dl	<0.05 g/L
Complement C3 (adults)	86-184 mg/dl	0.86-1.84 g/L

C4 (adults)	20-58 mg/dl	0.20-0.58 g/L
Total complement (adults)	63-145 units/mL	63-145 kU/L
--SF Agarose electrophoresis	No banding seen in an 80-fold concentration	NA
Aualitation of albumin (adults	11.0-50.9 mg/dl	0.11-0.51 g/L
Quantitation of IgG (adults)	0.0-8.0 mg/dl	0o.0-0.08 g/L
Haptoglobin	16-199 mg/dl	0.16-1.99 g/L
Immunoglobulin (adults) IgA	60-309 mg/dl	0.60-3.09 g/l
IgE	10-179 IU/ml	24-430 µg/L
IgG	614-1295 mg/dl	6.14-12-95 g/L
IgM	53-334 mg/dl	0.53-3.34 g/L
Rheumatoid factor	<30 IU/ml	<30 KIU/L
Viscosity	1.4-1.8 relative viscosity units, as compared with water	1.4-1.8 relative viscosity units, as compared with water

NA = Not applicable

Haematology

Analyte	**MGH Unit**	**SI Unit**
Activated protein C resistance (factor V leiden)	Ration >2.0	NA
Antiphoslipid-antibody panel Partial thromboplasma time-lupus anticoagulant screen	Negative	Negative
Platelet-neutralization procedure	Negative	Negative
Anticardiolipin antibody IgG IgM	0-15 GPL units 0-15 MPL units	0-15 arbitrary units 0-15 arbitrary units
Antithrombin III Immunologic Functional	22-39 mg/dl 80%-130%	220-390 mg/L 0.8-1.30 units/l
Bleeding time (adults)	2-9.5 min	2-9.5 min
D-dimer	<0.5 µg/ml	<0.5 mg/L
Differential blood count Neutrophils Bands Lymphocytes	 45%-755 0%-5% 16%-46%	 0.45-0.75 0.0-0.5 0.16-0.46

Monocytes	4%-115	0.4-0.11
Eosinophils	0%-8%	0.0-0.8
Basophils	0%-3%	0.0-0.03
Erythrocyte count (adults) Female	4.10-5.10 x 106/ mm^3	4.50-5.30 x 1012/L
Male	4.50-5.30 x 106/ mm^3	4.10-5.10 x 1012/L
Erythrocyte sedimentation rate Female	1-25 mm/h	1-25 mm/h
Male	0-17 mm/h	0-17 mm/h
Factor II, prothrombin	60%-140%	0.60-1.40
Factor V	60%-140%	0.60-1.40
Factor VII	60%-140%	0.60-1.40
Factor VIII	60%-200%	0.50-2.00
Factor IX	60%-140%	0.60-1.40
Factor X	60%-140%	0.60-1.40
Factor X	60%-140%	0.60-1.40
Factor XI	60%-140%	0.60-1.40
Factor XII	60%-140%	0.60-1.40
Factor XII screen	60%-140%	0.60-1.40
Factor-inhibitor assay	No deficiency detected	NA

Ferritin Female Male	 10-200 ng/ml 30-300 ng/ml	 10-200 µg/L 30-300 µg/L
Fibrin (ogen)-degradation products	<2.5 µg/L	<2.5 mg/L
Fibrinogen	175-400 mg/dl	1.75-4.00 µg/L
Folate (folic acid) Normal Borderline deficient Excessive	 3.1-17.5 ng/ml 2.2-3.0 ng/mL >17.5 ng/mL	 7.0-39.7 nmol/L 5.0-6.8 nmol/L >39.7 nmol/L
Hematocrit (adults) Female Male	 36.0-46.0 37.0-49.0	 0.36-0.46 0.37-.049
Hemoglobin (adults) Female Male	 12.0-16.0 g/dL 13.0-18.0 g/dl	 7.4-9.9 mmol/L 8.1-11.2 mmol/L
Hemoglobin A2	<3.5%	<0.04
Hemoglobin F	<0.025	<0.0002
Iron	30-160 µg/dl	5.4-28.7 µmol/L
Iron-binding capacity	228-428 µg/dl	40.8-76.7 µmol/l
Leukocyte count (WBC)	4.5-11.0 x 103/ mm^3	4.5-11.0 x 109/L
Mean corpuscular hemoglobin concentration (MCHC)	25.0-35.0 pg/cell	25.0-35.0 pg/cell

Mean corpuscular volume (MCV) (adults) Female Male	 78-102 µm3 78-100 µm3	 78-100 fl 78-102 fl
Partial thromboplastin time, activated	22.1-34.1 sec	22.1-34.1 sec
Plasminogen Antigen Functional	 8.4-140 mg/dl 80%-130%	 84-140 mg/L 0.80-1.30
Platelet count	150-350 x 103/ mm^3	150-350 x 109/L
Platelet, mean volume	64-11.0 µm3	6.4-11.0 fL
Protein C Total antigen Functional	 70%-140% 70%-140%	 0.70-1.40 0.70-1.40
Protein S Total antigen Functional Free antigen	 70%-140% 70%-140% 70%-140%	 0.70-1.40 0.70-1.40 0.70-1.40
Prothrombin time	11.2-13.2 se	11.2-13.2 sec
Red cell distribution witdth	11.55-14.5%	0.115-0.145
Reptilase time	16-24 sec	16-24 sec
Reticulocyte count	0.5%-2.55% red cells	0.005-0.0025 red cells

Ristocetin cofactor (functional von Willebrand factor		
Blood group O	75% mean of normal	0.75 mean of normal
Blood group A	105% mean of normal	1.05 mean of normal
Blood group B	115% mean of normal	1.15 mean of normal
Blood group AB	125% mean of normal	1.25 mean of normal
Sucrose hemolysis	<10%	<0.1
Thrombin time	16-24 sec	16-24 sec
Vitamin B12		
Normal		
Borderline		
Deficient		
Von Willebrand factor (vWF) Antigen		
Blood group O	75% mean of normal	0.75 mean of normal
Blood group A	105% mean of normal	1.05 mean of normal
Blood group B	115% mean of normal	1.15 mean of normal

Blood group AB	125% mean of normal	1.25 mean of normal
Von Wilebrand factor multimers	Normal distribution	Normal distribution

Part VI

Indexes

Indices

Part VII

References

References

Al-Ghamdi MA, Al-Shehri AM. Differences in generalist and specialist problem solving: conflict or complimentary purposes? Saudi Medical Journal 1996; 17: 422-427.

Al-hatani NH, Al-Jeffri MH. Manual of the Nacional Tuberculosis Control Program. 2nd edition. JAD Printing Press, K.S.A., 2003.

Al-Howasi M. Manual of Clinical Paediatrics. 3rd Edition. Riyadh: Medical Book House 2004.

Al-Khaldi YM, al-Jaser AM, Al- Gelban KS. Barriers to compliance among diabetes in Asir Region. Saudi Med J 1999; 20 (12): 951-953.

Allan H. Goroll, Laurence May, Albert G. Mulley. Primary Care Medicine. Office evaluation and Management of the Adult Patient. Lippincott Company, 2001.

Al-Mazrou Y, Al-Shehri S, Rao M. Principles and practice of primary health care. Ministry of Health, K.S.A, 1990.

Al-Nuaim A, Al-Mazrou Y, Al-Attas O, Al-Rubean K, Khoja T, Al-Daghari N. National Chronic. Metabolic Diseases Survey Part II. Ministry of Health and King Saud University, 1997.

Anne Stephenson. A Textbook of General Practice. Arnold Publisher, 1998.

Aram V. Chobarrian et al. Seventh Report of the Joint National Committee on Prevention, detection, Evaluation and Treatment of High Blood Pressure. Hypertnesion 2003.

Arias EA. Review for the Clinical Skills Assessment Exam. Philadelphia. Lippincott Williams & Wilkins, 2001.

Alkahtani NH, Al Jeffri MH. Manual of the National Tuberculosis Control Program, 2003, second Edition. Ministry of Health, Kingdom of Saudi Arabia.

Barker DJ, Hall AJ. Practical Epidemiology. 4th edition. Southampton U.K. Churchill Living stone. 1991.

Bazaldua OV, Schneider FD. Evaluation and management of dyspepsia. Am Fam Physician, 1999; 60: 1773-88.

Benenson AS. Control of Communicable Diseases Manual 2000. 17th edition. American Public Helath Association, Washington, U.S.A.

Borg DD. Handbook of Primary Care Medicine. 2nd Edition. Philadelphia: Lippincott – Raven Publisher, 1998.

Cartwright S, Godlee C. General Practice. 2nd Ed. London. Churchill Livingstone, 2003.

Chan PD, Johnson MT. Treatment Guidelines foe Medicine and Primary Care. Laguna ills: Current Clinical Strategies Publishing, 2002.

Chan PD, Thomas DM, Mckinley EW, and tanford EK. Outpatient and primary care medicine. California. Current Clinical Strategies Publishing, 2001.

Chartal Simon et al. Oxford Handbook of general Practitioner. Oxford, 2002.

Clinical Methods: A General Practice Approach. 3rd edition. Philadelphia: Lippincott Williams & Wilkins, 2002.

Cornel-Avendano B, Reteguiz J. Mastering the OSCE. New Cork. Mc Graw-Hill, 1999.

Courtney AU, Maccrater Df, Pollart SM. Childhood Asthma: Treatment update. American Family Physician, 2005: 1959-68.

Courtney AU, Mccaper DF, Pollart SM. Childhood Asthma: Tretament update. Am Fam Physician. 2005; 71: 1959-68.

David B. Shives, Brian K. Hennen, Donald E. Rice. Family Medicine. A Guide for Practitioner of the Art. Mac Graw Hill Hook Company, 1987.

Desai SP, IsapPratt S. Clinician's Guide to Laboratory Medicine. Hudson, Lexi-comp Inc, 2000.

E-Hazmi MA, Al-Abdul Jabbar FA, Al-faleh FZ, Al-Swailem AM, Bahakin HM, Al-Swailem AA, et al. Aspects of human haemoglobins and hemoglobinogenetics in the Arabian Peninsula-Studies of population, molecular genetics and development of clinical and control and prevention strategies. Riyadh. KACST, 2003.

Ferri F. Practical Guide to the Care of the Medical Patient. 3rd edition. Singapore: Harcourt brace Asia, 1998.

Franko JP. Outpatient Medicine Recall. Blatimore: Williams & Wilkins, 1998.

Fraser RC. Clinical Method: A General Practice Approach. 3rd ed. Oxford. Butterworth Heinmann, 1999.

Giesecke Johan. Modern Infectious Disease Epidemiology. 1st edition. Arnold, U.K. 1994.

Glaser AN. High Yield Biostatistics. Philadelphia. Lippincott Williams & Wilkins, 2001.

Goo Lee C, Cartwright S. General Practice. 2nd Edition, Edinburgh: Churchill Livingstone, 2003.

Graber MA, Jones JL, Wilbur JK. The Family Medicine Handbook. Fifth edition, Saunders Elsevier. Philadelphia,2006

Gross R. Decisions and Evidence in Medical Practice. St. Louis: Mosby, Inc., 2001.

Gupta LC, Gupta A. Differential diagnosis. 5th edition. New Delhi: Jaypee Brothers Medical Publishers Ltd. 1998.

Gupta RS, Sharma BD, Bhalla NS. Principles and practice of management. Sixth edition. India, 1997.

Hamamy H, Alwan A. Genetic disorders and congenital abnormalities: strategies for reducing the burden in the region. Eastern Mediterranean Health Journal 1997; 3: 123-132.

Khattab MS, Abolfotouh MA, Khan MY, Humaidi MA, Al-Khaldi YM. Compliance and control diabetes in family practice setting, Saudi Arabia. Eastern Mediterranean Health Journal 1999; 5 (13): 755-765.

Khoja TA, Samir ME. Saudi Arabia Family Health Survey 1996. Riyadh: Ministry of Health, 2000.

Khot A, Polmear A. Practical General Practice. 3rd Ed. Oxford: Butterworth-Heine mann 2000.

Kimmel SR, Vaccine Adverse Events: Separting Myth from Reality. Am Fam Physician 2002; 66; 2113-20.

Lipsky MS, Mitchell SK. Blueprints in Family Medicine. Malden: Blackwell Science, 2003.

Maguire P. Communication Skill for Doctors. London: ArLond, 2000.

Mallin R. Smoking Cessation: Intergration of behavioural and drug therapies. Am Fam Physician 2002; 65: 1107-14.

Mengel MB and Schwiebert LP. Ambulatory Medicine. The primary care of families. 3rd ed. Boston. Mcgraw-Hill, 2001.

Milaat W. Public Health Around the World: Saudi Arabia. Public Health Medicine, 1999; 1: 34-38.

Ministry of Health. Mortality Report of Ministry of Health Hospitals (1997-2001). Riyadh, K.S.A, 204.

Ministry of Health .Health statistical year book, 2006. Riyadh,KSA.

Mishkhas AA. Manual for vaccination Room Staff. MOH, Riyadh, Dar Alhilal, 2006.

Munro J and Campelle IW. Macleodes Clinical Examination 10th ed. Edinburgh. Churchill Livingstone 2000.

Murtagh J. General Practice. 3rd edition McGraw-Hill. Australia, 2003.

Myers A. Medicine. 3rd Edition. Blatimore: Williams & Wilkins, 1997.

Myers AR. Medicine. National Medical Series for Independent Study. 5th ed. Philadelphia-Lippincott. Williams & Wilkins, 2005.

National Chronic Metabolic Diseases Survey Part I. Prevention of Diabetes Mellitus, Obesity and Hypercholestrolemia in Saudi Arabia. Ministry of Health and King Saud University, Riyadh, K.S.A., 1995.

Nussebaum RL, McInnes RR, Willard HF and Boerkoel III CF. Thompson Genetics in Medicine. 6th ed. Philladelphia. Sauders 2004.

Patel AT, Ogle AA. Diagnosis and management of acute low back pain. Am Fam Physician 2000; 61: 1779-90.

Paulman PM, Paulman AA, Harrison JD. Taylor's Manual of Family Medicine. Lipincotte, Williams & Wilkins, third edition, Philadelphia, 2008.

Pencheon D, Guest C, Melzer D, Gray JA. Oxford Handbook of Public Health Practice. Oxford: Oxford University Press, 2003.

Plantz S, Adler JN. Emergency Medicine. Philadelphia: Lippincott Williams & Wilkins, 1998.

Polmear A, Khot A. Practical General Practice. 3rd ed. Oxford. Butterworth Heinemann, 2000.

Porland's medical Dictionary. 23rd edition. Philadelphia. WB Sau nders, 1982.

Pritchard DJ, Korf BR. Medical Genetics at a Glance. Oxford. Blackwell Science Ltd, 2003.

Provan D, Krenz A. Oxford Handbook of Clinical and Laboratory Investigation. Oxford. Oxford. Oxford University press, 2003.

Provan Drew, Henson Andrew. ABC of clinical Hematology. London: BMJ Publishing Group 1998.

Rakel RE. Essentials of Family Practice Medicine, Fundamentals and Case Studies. 3rd edition. Saunders and Elvier, Philadelphia, USA. 2006.

Reteguiz JA, Cornel-Avendano B. Mastering the OSCE. New Cork: Mc Graw-Hill, 1999.

Robert T, Blackwood R. Lecture Notes on Clinical Skills. 3rd ed. London. Blackwell Science, 1998.

Robert Taylor. Fundamental of Family Medicine. Spring-Verlag, 1983

Robert Taylor. Manual of Family Practice. Lipincotte, Williams & Wilkins, second Edition, Philadelphia, 2000.

Robins Frase. Clinical method – A General Practice Approach. Butterworth, Heinmann 2003.

Rosenthal J, Naish J, Neighbour R, Sigh S. The Successful GP Registrar's Companion. Edinburgh: Churchill Livingstone, 2003.

Rosenthal J, Naish J, Neighbour R, Singh S. The successful GP. London, Churchill Livingstone, 2003.

Rosser WW, Slawson DC, Shauhnessy AF. Evidence-Based Family Medicine. 2nd edition, Hamilton: BC Decker inc. 2004.

Rycroft RJ, Robertson SJ. A colour Handbook of Dermatology. London: Manson Publishing 2002.

Saultz JW. Textbook of Family Medicine. New York: Mcgraw-Hill, 2001.

Saunders BD, Trapp RG. Basic & Clinical Biostatistics. 2nd edition. Appleton & Lange, 1994.

Scally JH. Psychiatry. National Medical Series for Independent study 4th ed. Philadelphia. Lippincott Williams & Wilkins, 2001.

Schwartz L, Preece PE, Hendry RA. Medical Ethics: A case-Based Approach. Edinburgh: Elsevier Science Limited, 2002.

Silman AJ, Macfar GJ. Epidemiological studies. 2nd edition Cambridge University Press, 2002.

Simon C, Evertt H, birthwistle J and Stevenson B. Oxford handbook of General Practice. Oxford. Oxford University Press, 2003.

Stephenson Anne – A textbook of General Practice. 1st edition Arnold, U.K. 1998.

Stern TA, Herman JB, Salvin PL. The MGH Guide to Psychiatry in Primary Care. New York: Mc Graw-Hill, 1998.

Stevens L, Rodin Lan. Psychiatry. An illusorated colour text. London. Churchill Livingston, 2001.

Straus SE, Richardson WS, Glasziou P, Haynes RB. Evidence – Based Medicine. How to Practice and Teach EBM. 3rd Ed. Edinburgh. Elsevier, 2005.

Taylor R. Fundamentals of Family Medicine. New York: Springer-Verlag, 1996.

Taylor RB. Family Medicine: Principle and Practice. 5th Edition. New York: Springer-Verlag, 1997.

Taylor RB. Manual of Family Practice. 1st edition Little Brown. U.S.A., 1997.

Taylor RJ, McAroy BR, O'Dowd T. General Practice medicine. Edinburgh: Churchill Livingstone, 2003.

The Scientific Committee of Quality Assurance in Primary Health Care. Quality Assurance in Primary Health Care Manual. 1st edition. DAR al-Hilal Printing Press. Riyadh, K.S.A.

Warsy AS, El-Hazmi MAF. Diabetes Mellitus, hypertension and obesity. Common multi-factoriak disorders in Saudis. EMHJ 1999; 5: 1236-1242.

Weinstock MB, Neides DM. The resident's guide to ambulatory care. 5th Edition Columbus: Anadem Publishing 2005.

Wiener JM. Behavioural Science. The National Series for Independent Study. 2nd ed. Philadelphia: Harwal Publising, 1990.

Young IP, Mueller RF. Emery's Elements of Medical Genetics. 11th ed. Edinburgh. Churchill Livingstone, 2004.

FAMILY MEDICINE: A Practical Approach shares essential tools for developing a successful practice and basic clinical methods and principles that will guide medical students, residents, general practitioners, and certified family physicians through the daily routine of a family practitioner.

Beginning with a thorough definition and history of family practice, Khalid S. Al-Gelban, Yahia M. Al-Khaldi, and Mohammad M. Diab provide a comprehensive overview of a medical discipline where the family physician is a skilled clinician and the doctor-patient relationship is central. Al-Gelban, Al-Khaldi, and Diab cover a broad range of topics that include medical ethics, problem solving processes, and key areas for action to improve health while teaching specific methods for diagnosing illness, prescribing medicine, and ensuring patient compliance. Medical professionals will also learn how to interview patients with specific symptoms and conduct physical examinations that will lead to accurate diagnoses and successful treatment plans.

From anxiety disorders to insomnia to hypertension, Family Medicine: A Practical Approach will lead medical professionals of all levels and experience through a discipline that is challenging, rewarding, and focused on providing excellent care to patients throughout the world.

ISBN 978-1-4269-2440-8
90000
9 781426 924408

Trafford PUBLISHING®