



2. Why Applying Human Factors Is Important For Patient Safety

Objectives:

- Understand Human Factors And Its Relationship To Patient Safety
- Define The Meaning Of The Term Human Factors
- Explain The Relationship Between Human Factors And Patient Safety
- Identify The Principles Of Applying Knowledge Of Human Factors Into Practice

Important | **Doctors' notes** | **Extra** | **New terminology**

[Editing file](#) | [Feedback form](#) | **Lecture Handout** 

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Human Factors

also known as "Ergonomics"

make it easier For Him
to do work in the right way

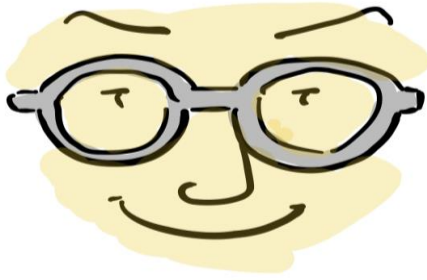


In Health Care:

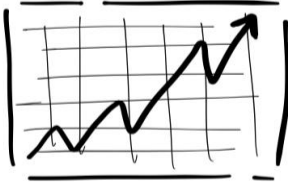
Good
Human
Factors



Low
adverse
Events

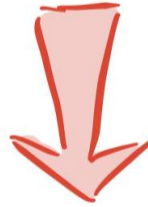



Human Factors Experts



Improvement
↳ work place } to fit
↳ equipment } limitations & capabilities

make it easier For Him to do work in the right way



decrease likelihood of Error 

Range of WORKERS

Both included



Inexperienced & Experienced

If these tasks become easier for
the Health Care provider

Then Patient safety can improve



prescribing & dispensing



medication

- ordering
online

- preparing



Hand-over
information



moving patients

TRAPS !



Look alike
sound alike
meds

complex
equipment
design



Infusion
pump

Human Factors

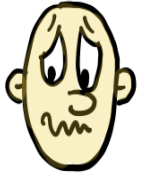
acknowledge



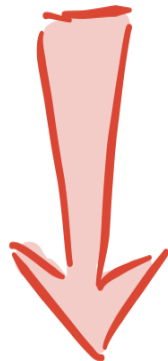
the Universal
Rule of
Human
Fallibility



Error
is
INEVITABLE



& design things in
work place to



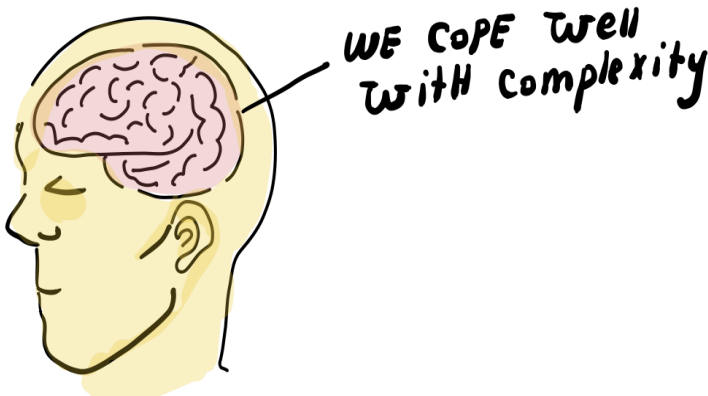
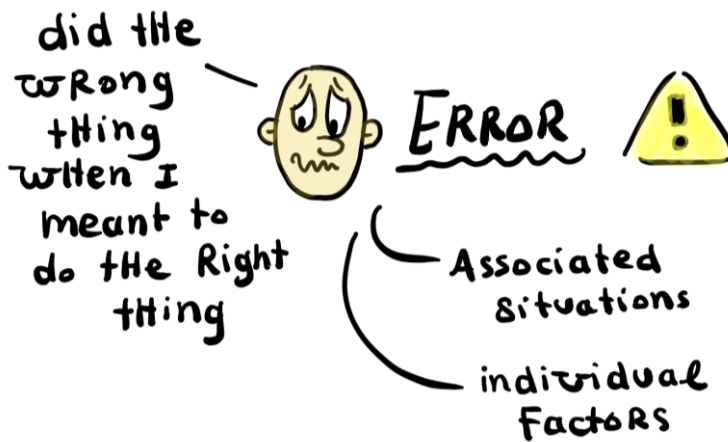
decrease
likelihood
of
Error



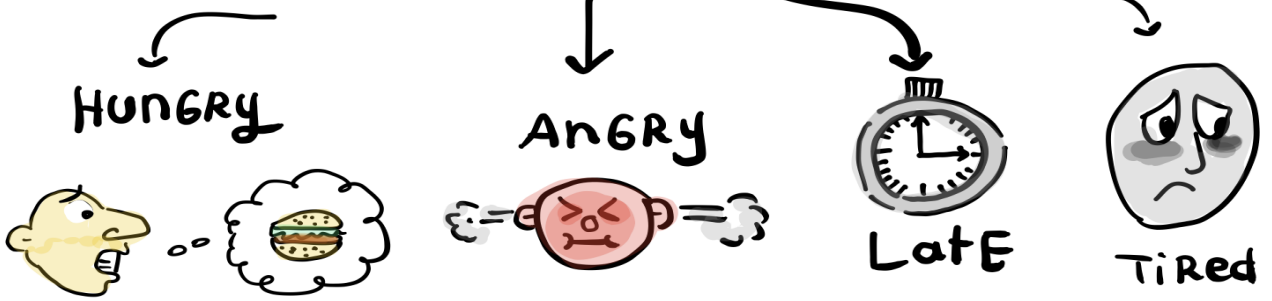
- our decisions & actions Can Be Flawed
- Human Beings make Silly mistakes



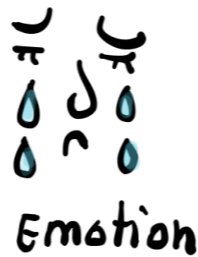
- Human Error = Human NATURE



don't approach patient if "HALT" you're?



PERFORMANCE SHAPING FACTORS "checklist"

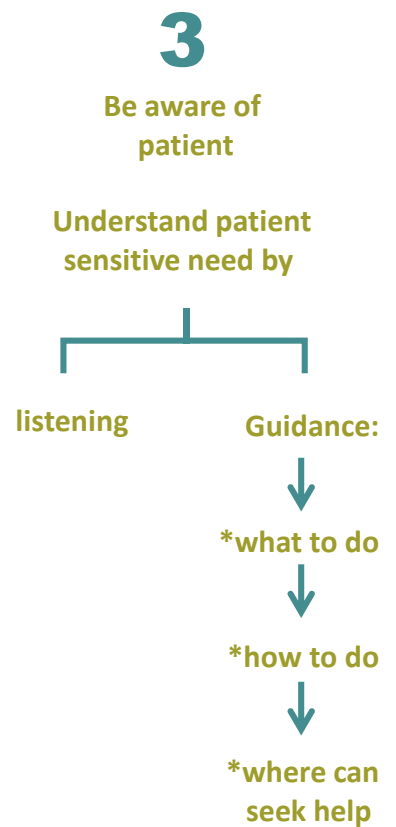
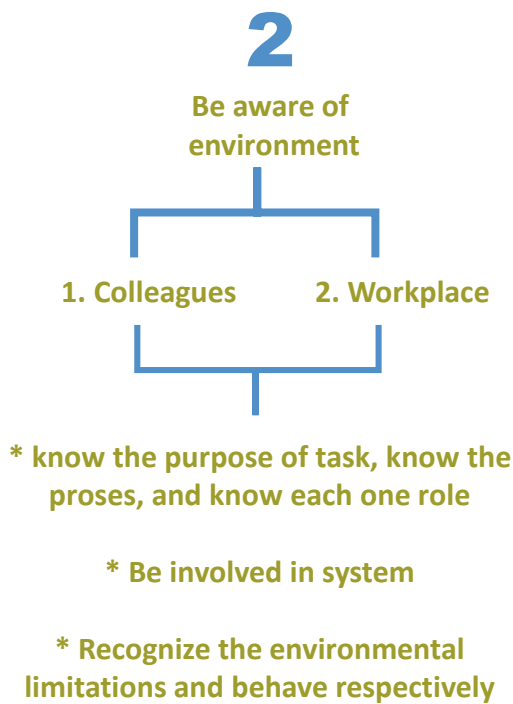


Dr. Nada's Introduction

Components of care compassion cycle is used to illustrate how to apply human factors in effective and efficient way as a healer.



components of care compassion cycle



To sum-up :

- 1) care for your self
- 2) Collaborate with others and stander the environment
- 3) Provide care for patient

1. Define the meaning of the term human factors.

Human Factors And Ergonomics Definitions

human factors or ergonomics: terms used to describe the interrelationship between individuals at work, their equipment and tools, and the environment in which they live and work. From The Handout

- It is a theory from engineering's
- The study of all the factors that make it easier to do the work in the right way.
- Apply wherever humans work. also at home.
- Also sometimes known as ergonomic.

It is about thinking in the best way → following the best method
→ meeting requirements → ending up with the best outcome

What does "human factors" mean? From The Handout

- Human factors apply wherever humans work.
- Human factors acknowledges the universal nature of human fallibility.
- The traditional approach to human error might be called the "perfectibility" model, which assumes that if health-care workers care enough, work hard enough, and are well trained, errors will be avoided.
- Our experience, and that of international experts, tells us that this attitude is counter-productive and simply untrue.

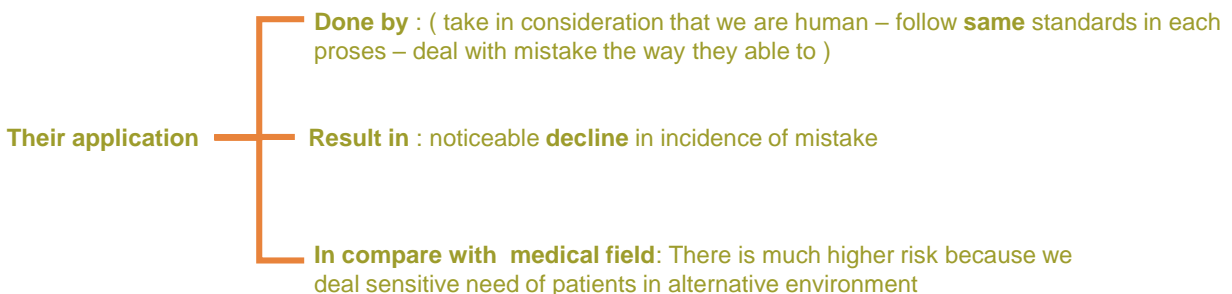
Human Factors

Importance of human factors has been recognized for a long time in :
logically who will apply human factors ?! Those fields with high risk such as:

- Aviation –i.e. the flying or operating of aircraft- so advanced¹ (Zero error)
- Manufacturing (Ex : airplanes and petrochemicals)
- Military

¹ story: there is a pilot landed into the river, no one from the passengers know that he landed into the river, how did he do that?

He was every day if he didn't go to the work he went to the simulator and practicing how to land at the river.....we wish in healthcare to have zero error.



2. Explain The Relationship Between human Factors & Patient Safety

The Importance Of Human Factors In Health Care

Why they are important? Because they make your life easy at the personal level, patient and your colleagues.

- Human factors only recently acknowledged as an essential part of patient safety
- A major contributor to adverse events² in health care
- All health-care workers need to have a basic understanding of human factors principles Why? because they are dealing with humans, so every thing can effect the patient safety

² things are unexpected: there are relationships between human factors and adverse events, if you have good human factors you will have low adverse events.

Why is the issue of human factors in health care important?

From The Handout

- Human factors issues are major contributors to adverse events in health care.
- In health care, human factors can have serious and sometimes fatal consequences.
- However, the health-care system can be made safer by recognising the potential for error, and by developing systems and strategies to learn from mistakes, so as to minimize their occurrence and effects.

Human Factors Experts

- Design improvements in the workplace and the equipment to fit human capabilities and limitations
- Make it easier for the workers to get the work done in the right way
- Decrease the likelihood of errors occurring³

³ how the error happen? If there is a gap between what I plan for and what happen.



Human Factors in Healthcare
2:31 Min
A video played by the doctor

2. Explain The Relationship Between human Factors & Patient Safety

The Range Of Workers

Good human factors design in health care accommodates the entire range of workers. Not just the calm, rested experienced clinician -*even the expert clinicians make mistakes*-. But also the inexperienced health-care workers who might be stressed, fatigued and rushing

Examples

- Prescribing and dispensing⁴ (*hand writing problems بعض الدكاترة خطهم موب واضح فيصير لخبطة اثناء الصرف*)
- Hand-over⁵/hand-off information (*on-call doctors are very tired when they hand over so they don't give good reports about the patients to the one after them*)
- Move patients (*some nurses get injured from lifting the patient, so they should use machines to carry the patient*)
- Order medications electronically
- Prepare medication

If all of these tasks become easier for the health-care provider, then patient safety can improve

⁴ صرف الدواء

⁵ the giving of control of or responsibility for something to someone else

Examples Of Traps In Health Care?

- Look-alike and sound-alike medications
- Equipment design complexity
 - e.g. infusion pumps



Avoidable confusion is everywhere...



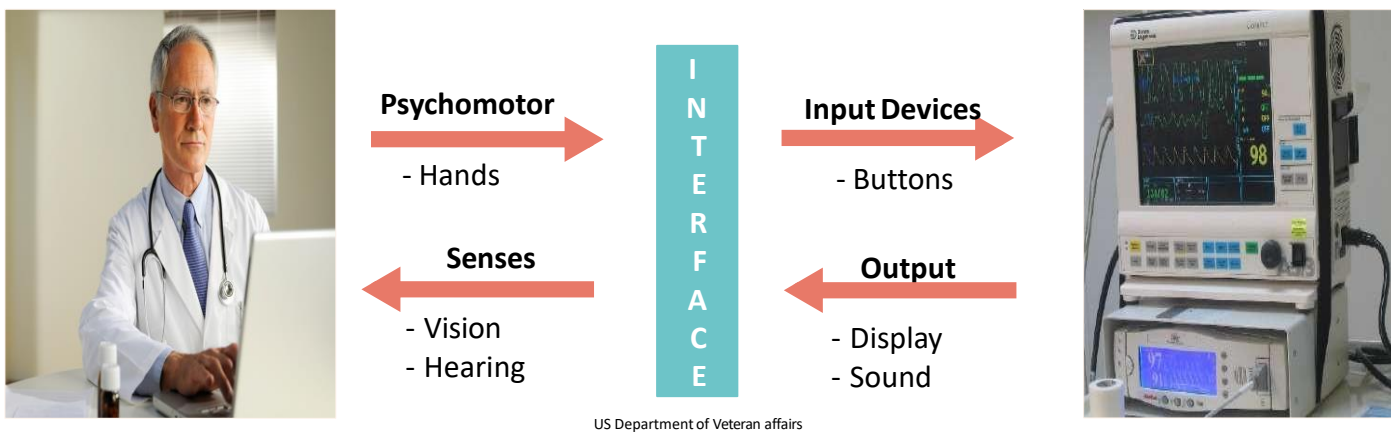
Health care is increasingly complex

3. Identify The Principles Of Applying Knowledge Of Human Factors Into Practice

Human Factors

- **Acknowledges:**
 - The universal nature of human fallibility. *That's mean we are designed to make mistakes.*
 - The inevitability (*certain to happen*) of error
- Assumes that errors will occur
- Designs things in the workplace to try to minimize the likelihood of error or its consequences

Human factors design principles



The study of human factors:

From The Handout

- **Human-machine interactions:** Advanced technologies used in health care have increased the relevance of human factors in errors because the potential for harm is great, when technology and health-care devices are mishandled.
- **Human-human interactions:** Tired health-care professionals are more prone to memory lapses and mistakes, because fatigue can impair performance.
- **Human-human interactions:** Knowledge of human factors allows better understanding of the impact of fatigue, stress, poor communication, disruption and inadequate knowledge and skills on health professionals. It helps to understand predisposing characteristics that may be associated with adverse events and errors.

We Cope Quite Well With Complexity

Health-care workers are quite good at compensating for some of the complex and unclear design of some aspects of the workplace like:

- Equipment
- Physical layouts

Because The Human Brain Is

- very powerful
- very flexible
- good at finding shortcuts (fast)
- good at filtering information
- good at making sense of things

Never ever ever in practice depend in your memory (document or write it anywhere)

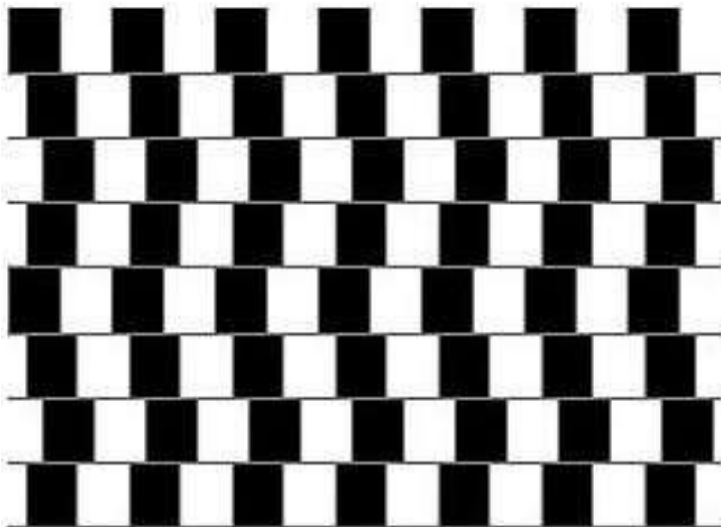
But also distractible, which is a strength and a weakness. Distractibility:

From The Handout

- helps humans notice when something unusual is happening.
- Humans are good at recognizing and responding to situations rapidly and adapting to new situations and new information.
- predisposes humans to error.

Sometimes Our Brain Can Play 'Tricks' On Us

Are the lines crooked or straight?



Optillusions.com

Look at the chart below

Say the *colour* of the word, not the word itself

YELLOW BLUE ORANGE
BLACK RED GREEN
PURPLE YELLOW RED
ORANGE GREEN BLACK
BLUE RED PURPLE
GREEN BLUE ORANGE

Source: Optillusions.com

Why Is It Hard?

3. Identify The Principles Of Applying Knowledge Of Human Factors Into Practice

Decisions And Actions Can Be Flawed

The fact that we can misperceive situations despite the best of intentions is one of the main reasons that our decisions and actions can be flawed such that "silly" mistakes are made.

Human Beings Make “Silly” Mistakes

Regardless of their experience, intelligence, motivation or vigilance, people make mistakes

Examples of contributing factors of making a mistake:

- If you have a low efficiency.
- Complicated machine.
- Not trained to use that machine.
- not focusing.

The Context Of Health Care

When errors occur in the workplace the consequences can be a problem for the patient

- A situation that is relatively unique to health care

One Definition Of “Human Error” Is “Human Nature”

Error is the inevitable downside of having a brain!

What Is An Error?

- The failure of a planned action to achieve its intended outcome
يعني خططنا لكن وصلنا لنتيجة غلط
- A deviation between what was actually done and what should have been done.
لما نخطط لكن نسوي الطريقة بشكل خاطئ

A definition that may be easier to remember is: “Doing the wrong thing when meaning to do the right thing”.

3. Identify The Principles Of Applying Knowledge Of Human Factors Into Practice

Situations Associated With An Increased Risk Of Error

- unfamiliarity with the task (Especially if combined with lack of supervision)
- Inexperience (Especially if combined with lack of supervision)
- shortage of time. *and staff*
- inadequate checking. *Check yourself and the environment.*
- poor procedures
- poor human equipment interface

Individual Factors That Predispose To Error

- Limited memory capacity
- Further reduced by:
 - Fatigue
 - Stress
 - Hunger
 - Illness
 - Language or cultural factors
 - Hazardous attitudes

Fatigue

24 hours of sleep deprivation has performance effects ~ (Similar to) blood alcohol content of 0.1%

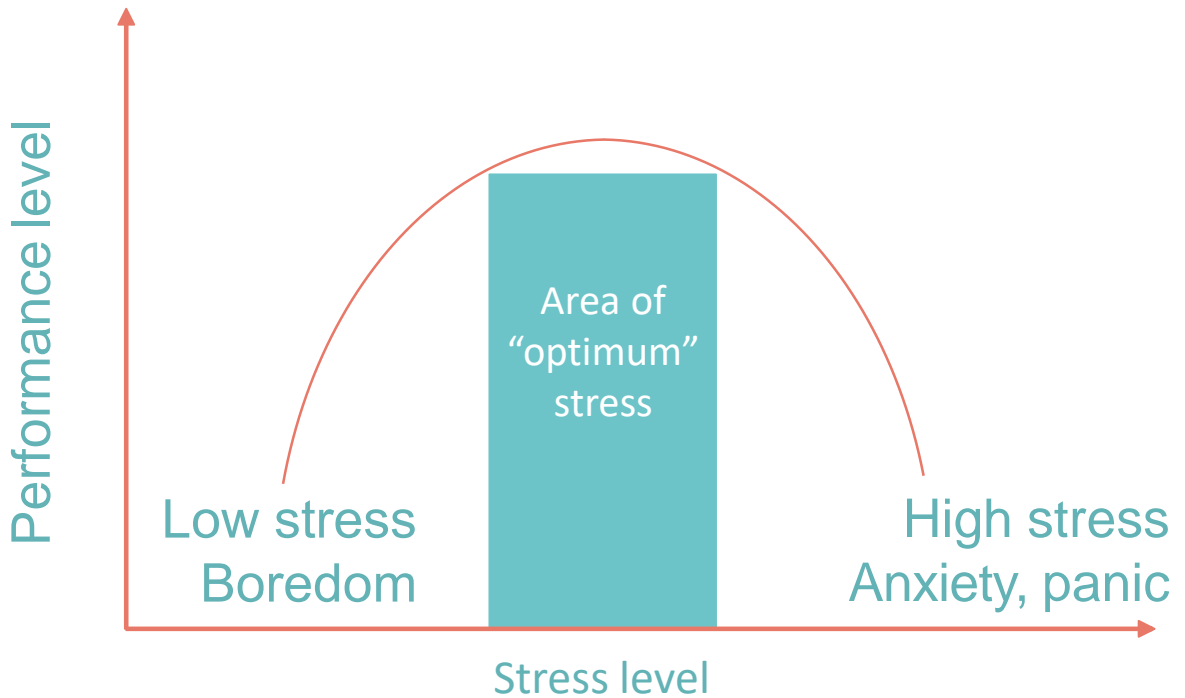
Source: D. Dawson, Nature, 1997



Just A Routine Operation
13:55 Min
A video played by the doctor

3. Identify The Principles Of Applying Knowledge Of Human Factors Into Practice

Stress And Performance



The relationship between stress and performance

Source: Yerkes, R. M., & Dodson, J. D. (1908) *The relation of strength of stimulus to rapidity of habit-formation. Journal of Comparative Neurology and Psychology, 18, 459-482*

Don't Forget if You're

H ungry	H
A ngry	A
L ate	L
T ired	T

Don't approach the patient unless you get back on track

3. Identify The Principles Of Applying Knowledge Of Human Factors Into Practice

A Performance-shaping Factors “Checklist”

- **I** : Illness
- **M** : Medication: prescription, over-the-counter & others
- **S** : Stress
- **A** : Alcohol
- **F** : Fatigue
- **E** : Emotion

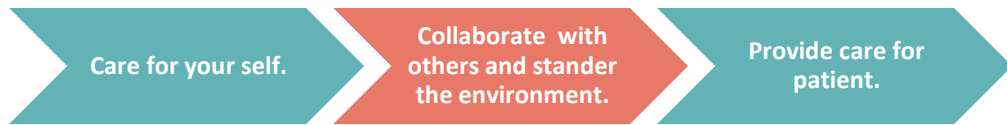
Putting Knowledge Of Human Factors Into Practice

- Apply human factors thinking to your work environment
- Avoid reliance on memory
- Make things visible
- Review and simplify processes
- Standardize common processes and procedures
- Routinely use checklists
- Decrease reliance on vigilance



Summary

- **How to apply human factors in effective and efficient way as a healer?**



- **Meaning of the term human factors:**

- The study of all the factors that make it easier to do the work in the right way.
- Apply wherever humans work.
- Also sometimes known as ergonomic.

- **Importance of human factors In Health Care:**

- A major contributor to adverse events² in health care.
- All health-care workers need to have a basic understanding of human factors principles

- **Human Factors Experts**

- Design improvements in the workplace and the equipment to fit human capabilities and limitations.
- Make it easier for the workers to get the work done the right way.
- Decrease the likelihood of errors occurring.

- **human factors:**

- **Acknowledges:**

The universal nature of human fallibility. That's mean we are designed to make mistakes.

The inevitability (certain to happen) of error.

- Assumes that errors will occur.
- Designs things in the workplace to try to minimize the likelihood of error or its consequences.

- **What Is An Error?**

Doing the wrong thing when meaning to do the right thing.

- **Putting Knowledge Of Human Factors Into Practice**



Q1: What is the meaning of the term human factors:

- The study of all the factors that make it easier to do the work in the right way.
- Apply wherever humans work.
- Also sometimes known as ergonomic.

Q2: Enumerate two examples of traps in health care?

- Look-alike and sound-alike medications
- Equipment design complexity
 - e.g. infusion pumps

Q3: Enumerate two individual factors that predispose to error?

- Limited memory capacity
- Further reduced by:
 - Fatigue
 - Hunger
 - Language or cultural factor
- Stress
- Illness
- Hazardous attitudes

Q4: Enumerate two human factors?

- Distractions
- Stress
- Poor communication
- Illness:
- Disorganize workplace:

Q5: What is HRO - High reliability organizations ?

- HRO means to reduce and even prevent harmful events near zero
How ? By : Implementation of Safety, Good system of Communication, Process Improvement

Q6: Enumerate characteristics of HRO - High reliability organizations -?

- Preoccupation with failure
- A Culture of safety
- Sensitivity to operations
- Commitment to resilience

Q7: Enumerate two Reason's "Swiss cheese" model of accident causation and defined it?

It is a model used in the risk analysis and risk management of human systems

- Patient interaction with the physician
- Clear typing for medications on reports and papers



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Lecture Overview Is Drawn By:

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References: Doctors' slides (WHO, Patient Safety Curriculum Guide) + notes.