

3rd lecture:

HYPERTENSION: AN OVERVIEW

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Objectives:

- Understand the basic concepts of hypertension
- Explain the magnitude of the problem
- Identify important risk factors for hypertension
- Identify the important complications of hypertension
- Explain important concepts of prevention and control of hypertension



Headlines

- Magnitude of the problem
- Risk factors
- Assessment & diagnosis
- Complications
- Prevention and control

Normal blood pressure is 120-140/60-90.
Less than 100/50 is considered hypotension.
Above 140/90 is considered hypertension

Magnitude

- In developed and developing countries alike, essential hypertension affects 25-35% of the adult population. Up to 60-70% of those beyond the seventh decade of life
- Each increment of 20 mmHg in systolic blood pressure or 10 mmHg in diastolic blood pressure doubles the risk of cardiovascular disease events independent of other factors.

Prevalence of Hypertension in Obese and non-Obese Saudis:

The study group: 14,805

Males: 6225

Females: 8580

The age: 14 – 70 years

Non-obese prevalence: 4.8% males
2.8% females

Obese prevalence: 8% males
8% females

Hypertension among attendants of primary health care centers in Al-Qassim region, Saudi Arabia:

Study sample: 1114

Prevalence: 30%

Higher among:

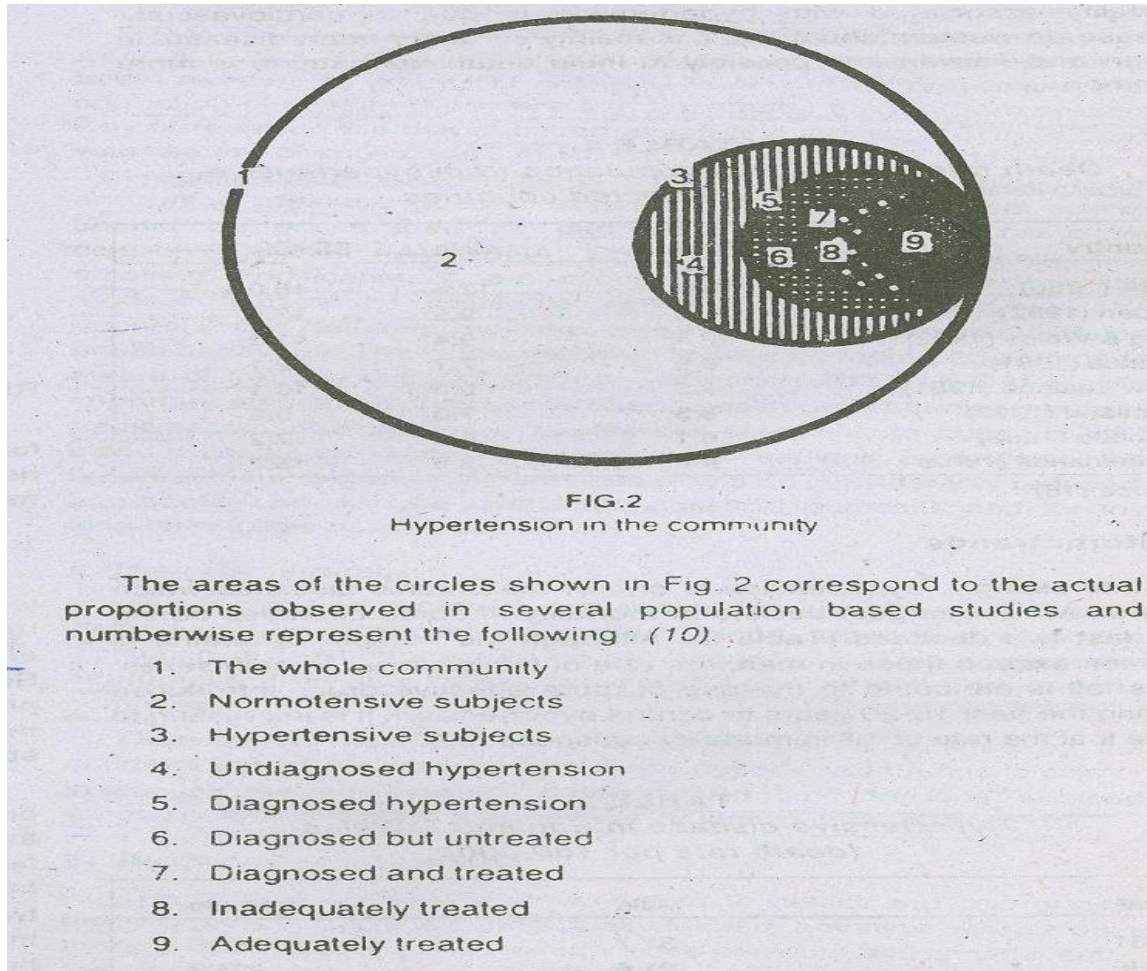
- Age > 40 years
- Overweight and obese people
- Illiteracy

Awareness: 20% of hypertensive women
25% of hypertensive men

Blood Pressure Measurement and Hypertension Diagnosis:

- 1 in 5 adult Canadians have hypertension
- Over 40% of Canadians at aged 56-65 have hypertension
- 90% of normotensive persons aged 55-65 developed hypertension in the next 20 years in the Framingham study

Hypertension in the community - Rule of halves:



- **Rule of halves** says that half of the adult community is hypertensive and half of those are undiagnosed. However, half of the diagnosed are untreated and half of the treated are inadequately treated.

Risk Factors:

- Smoking
- Dyslipidemia
- Diabetes Mellitus
- Obesity
- Age (older than **55 for men, 65 for women**). Women are more protective because of the presence of Estrogen, and this disappears after menopause.
- Gender (men or postmenopausal women)
- Family History of cardiovascular disease (men under age 55 or women under age 65)

Modifiable Risk Factors for Developing Hypertension:

- Obesity
- Poor dietary habits (high fat and low fibers)
- High sodium intake
- Sedentary lifestyle
- High alcohol consumption

Colors of Salt:

- | | |
|----------|----------------------|
| ▪ White | e.g. Table salt |
| ▪ Black | e.g. Soy sauce |
| ▪ Red | e.g. Ketchup |
| ▪ Yellow | e.g. Mustard |
| ▪ Green | e.g. Pickles |
| ▪ Brown | e.g. Soups & gravies |
| ▪ Clear | e.g. Saline |

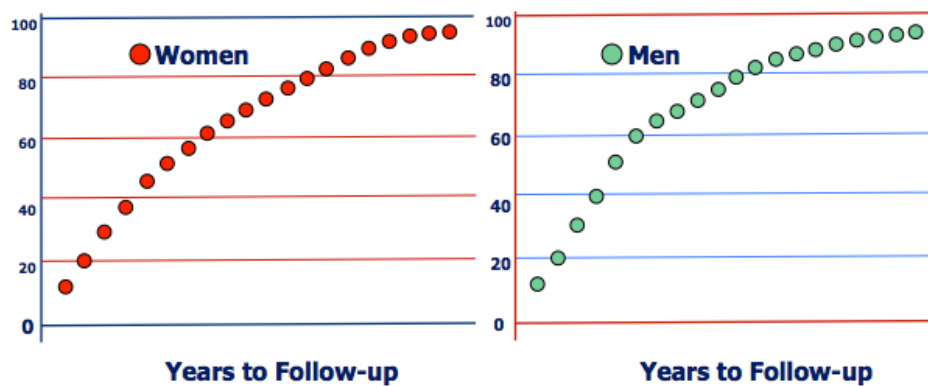


Salt is not always white in color, above are examples of non-whitish salts

High Risk Subjects:

- ▶ ≥ 180 systolic and/or ≥ 110 diastolic
- ▶ Systolic BP > 160 with low diastolic < 70
- ▶ Diabetes mellitus
- ▶ Metabolic syndrome
- ▶ ≥ 2 cardiovascular risk factors (smoking, dyslipidemia, obesity,

Lifetime Risk of Hypertension in normotensive women and men aged 65 years



Types of hypertension: 2007, USA

Essential* 92.0-95.0 %

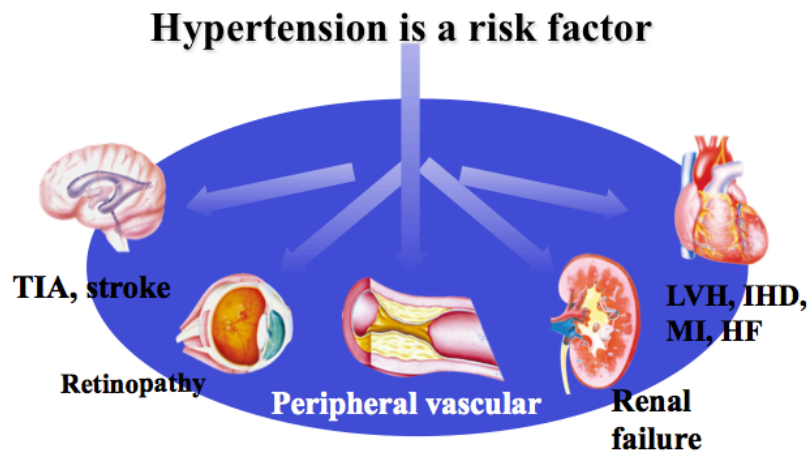
Secondary

Chronic kidney disease	3.0-6.0 %
Renovascular disease	0.2-1.0 %
Pheochromocytoma	0.1-0.2 %
Aldosteronism	0.1-0.3 %
Cushing's syndrome	0.1-0.2 %
Coarctation	0.1-0.2 %
Oral contraceptives	0.2-1.0 %

* Onset in 30s and 40s, gradual onset, family history, obesity

Essential hypertension is a hypertension without a known organic cause, and it accounts for 90% of all hypertensive patients. Nevertheless, it is diagnosed as essential hypertension **after the exclusion of all the other causes**.

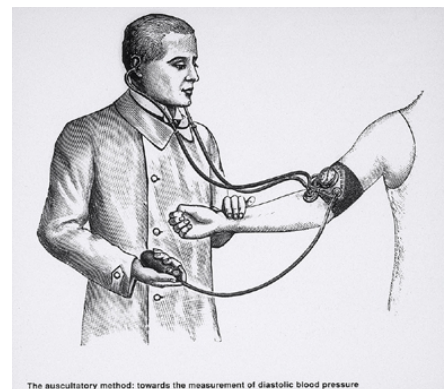
Complications of Hypertension:



TIA = transient ischemic attack; LVH = left ventricular hypertrophy; CHD = coronary heart disease; MI = myocardial infarction; HF = heart failure.

Assessment & Diagnosis:

Nikolai Korotkoff developed auscultatory method of blood pressure measurement (the sphygmomanometer) in 1905. The systole and diastole sounds you hear while taking the blood pressure are called Korotkoff sounds.



Noninvasive Blood Pressure Measurement:

- **Methodologies:**
 - Auscultatory (K sound)
 - Mercury
 - Aneroid
 - Oscillometric
- **Locations**
 - Upper arm
 - Wrist
 - Finger
- **Situations:**
 - Clinic
 - Home

Definitions and Classification of blood pressure: **IMP**.

	Systolic		Diastolic
Optimal	<120	and	<80
Normal	120–129	and/or	80–84
High normal	130–139	and/or	85–89
Grade 1 HTN	140–159	and/or	90–99
Grade 2 HTN	160–179	and/or	100–109
Grade 3 HTN	180	and/or	110
Isolated Systolic HTN	≥140	and	<90

Prevention & Control:

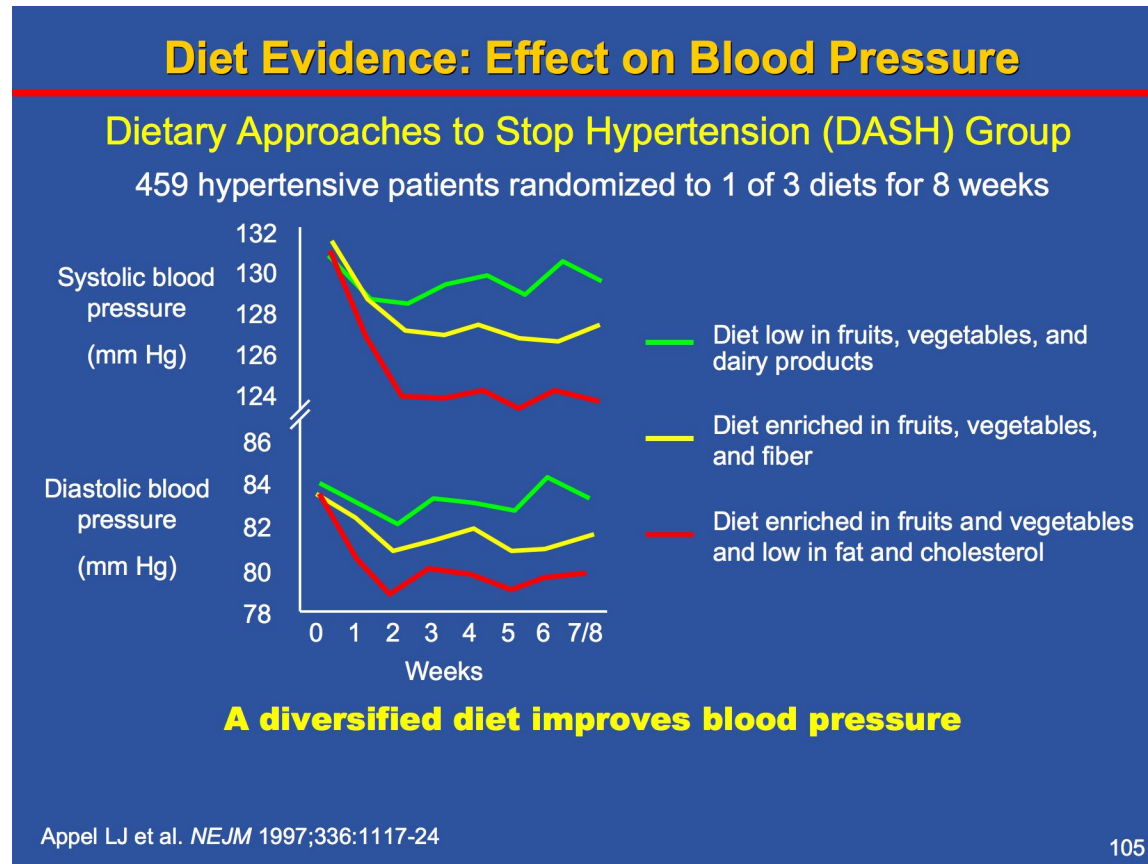
Primary Prevention – Population Strategies:

- ▣ **Reduce sodium intake**
- ▣ **Healthy diet:** high in fresh fruits, vegetables, low fat dairy products, dietary and soluble fiber, whole grains and protein from plant sources, low in saturated fat, cholesterol and sodium.
- ▣ **Regular physical activity:** 30-60 minutes of moderate intensity cardiorespiratory activity (e.g. a brisk walk); 5-7 days/week
in addition to routine activities of daily living
- ▣ **Low risk alcohol consumption** (≤ 2 standard drinks/day and less than 14/week for men and less than 9/week for women)
- ▣ **Maintenance of ideal body weight** (BMI 18.5-24.9 kg/m²)

■ Waist Circumference	Men	Women
■ - EMR, Europe, Sub-Saharan African	<94 cm	<80 cm
■ - South Asian, Chinese	<90 cm	<80 cm
- ▣ **Prevention / cessation of tobacco use**
- ▣ **Health Education**
- ▣ **Behavioral change**

Primary Prevention- High Risk approach

- Tracking of blood pressure from childhood, in high risk families



Secondary prevention

- Timely diagnosis and adequate control of BP
- Compliance with treatment

Indications for Pharmacotherapy:

Usual blood pressure threshold values for initiation of pharmacological treatment of hypertension.

Condition	Initiation
	SBP or DBP mmHg
• Systolic or Diastolic hypertension	≥140/90
• Diabetes • Chronic Kidney Disease	≥130/80

Benefits Of Lowering Blood Pressure:

- The Clinical Trials had shown:
 - Reduction in:
 - **STROKE**: 35 – 40 %
 - **MI**: 20 – 25 %
 - **HEART FAILURE** > 50%

Conclusion:

- **ASSESS AND MANAGE CARDIOVASCULAR RISK IN HYPERTENSIVES**
 - High dietary sodium intake, smoking, dyslipidemia, dysglycemia, abdominal obesity, unhealthy eating, and physical inactivity.
- **LIFESTYLE MODIFICATION**
 - Sustained lifestyle modification is the cornerstone for the prevention and control of hypertension and the management of cardiovascular disease. Encourage patients to reduce their sodium intake.
- **TREATING TO TARGET BP**
 - Treat blood pressure to less than <140/90 mmHg.
 - In people with diabetes or chronic kidney disease target to <130/80 mmHg and more than one drug is usually required including diuretics to achieve BP targets.

Global initiatives:

World Health Day 2013

Local hypertension initiatives:

- Saudi societies working in the hypertension field:
 - **Saudi hypertension management society**
 - **Saudi heart association**
- Related databases:
 - **HEARTS database**: <http://www.hearts-ksa.com/home.html>
 - **SPACE registry project in Saudi Arabia**: <http://www.space-ksa.com/>
 - **Saudi Hypertension management guidelines**