BLOCK L

Important points for ospes and vivas

By Fatima Haider

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KGMC

Paper-L (Renal-2, and Endocrine and Reproduction-2)

Table-5: MCQs

Subject	Renal-2	Endocrine and Reproduction-2	Total MCQs
Community medicine	11	6	17
Pharmacology	02	07	09
Pathology	11	12	23
Forensic medicine	01	06	07
Surgery	06	03	09
Gynaecology	01	39	40
Medicine	05	05	10
Pediatrics	02	01	03
Family medicine	01	01	02
Total	**40**	**80**	**120**

Table-6: OSPE/OSCE

Subject	Viva stations	OSPE/OSCE stations	Total
Pharmacology	2	1	3
Pathology	2	2	4
Forensic medicine	2	1	3
Community medicine	2	4	8
Research viva	2**	x	
Gynecology	1	2	3
Medicine (Endocrinology/DM)	0	1	1
Total	11	11	22

* A minimum of 22 stations will be used in final exams. The total marks will be 120 (6 marks for each station).

**there will be 2 allocated stations for research viva (one internal and one external) at one time for which the number of marks for each station will be 10 (with a total of 20 marks) allocated for research viva plus 15 marks for conducting research). A total of 35 marks have been allocated for the thesis (research project).

FORENSIC MEDICINE

Rape

An unlawful sexual intercourse by a man with a woman against her will, without her consent, or with her consent when it has been obtained by unlawful means, e.g. fraud, putting her in fear of death or hurt, drugging, or impersonation.

Rape Examination

* Informed consent should be obtained
* Examination should be made in presence of a third person
* Female examination should be done by or under the supervision of a female doctor
* A full examination include

1–preliminary data
2–statement of victim and others separately
3–signs of struggle on clothes and body
4–examination of genitals, urethra, mouth and anus
5–collection of lab specimens
6–inference
7–advice on follow up

Examination of Genitals, urethra, mouth and anus

* should take place in good light
* lithotomy position, if possible
*presence of blood stains noted
Dry blood–scraped with clean blunt scalpel
Matted hair– cut off and kept for examination
plucked hair preserved for lab examination
* Vulva, hymen, perineum examined for injuries
*Degree of hymen rupture examined with Glaister Keene Rod warmed at body temperature and if possible, transilluminated
* signs of Recent rupture are ragged tears in the hymen with lack of epithelial heating, but with edema and hemorrhage
*Gait is observed. when genital injury is present, gait is broad based and painful
* Distensibility of vagina– If it can admit two fingers easily, sexual interourse has occured

Specular examination

- It should be performed in sexually experienced women only.
- An appropriate size speculum is introduced into the vagina to inspect the condition of the vaginal mucosa, its rouginess and to locate any bleeding, injury or any other condition of the vaginal mucosa.

- The cervical part of the uterus can also be inspected during this stage.
- The examination may be painful in cases of recent injury.
- This examination allows the inspection of vaginal mucosa.
- The bruises of the vaginal mucosa appear as dark brown areas mostly on the anterior wall in the upper third.
- Laceration of vagina usually does not occur.

List of specimen from victim

1. Clothes entire lot (bearing stains and soiling)
2. Loose and matted hair
3. Swabs

    i) from the body

        a) seminal stains (areas other than vagina)

        b) salivary stains from bite marks

- ii) from the vagina

    a) from introitus, perinium

    b) from lower vagina (passing a swab just into the area above to hymenal boundary)

    c) from high vagina

    iii) from anal margins

    iv) from the posterior fornix

4. Scrapings from undersurface of the nails.
5. urine for screening of drugs and venereal diseases.

6. Control specimen

    i) Blood

    ii) Plucked hair (2 each)

        a) head hair

        b) pubic hair

    iii) Saliva

List of Specimen from victim

- Clothes entire lot (bearing stains and soiling)
- Loose and matted hair
- Swabs from the body
  - Seminal stains (areas other than vagina)
  - Salivary stains from bite marks
- Swabs from the vagina
  - From introitus, perineum
  - From lower vagina
  - From high vagina
- Swabs from anal margin
- Swabs from posterior fornix
- Scrapings from undersurface of nails
- urine for screening of drugs and venereal diseases
- Control Specimen
  - Blood
  - Plucked hair → 2 each head hair, pubic hair
  - Saliva

Medicolegal Aspects of Pregnancy:

1. A woman in advanced pregnancy may avoid attending the court as a witness
2. A pregnant woman is entitled to the estate left by her husband on behalf of prospective heir
3. When a convicted woman pleads to be pregnant, as a bar to hard labor or execution
4. When a woman blackmails a person and accuses him that she is pregnant because of him
5. When a woman asks for termination of pregnancy after rape
6. When a woman claims for more money after divorce on account of being pregnant

Medicolegal Aspects of Delivery:

After deliver:

- Vagina is wide roomy and lochia is seen
- Vagina is lacerated
- Signs of episiotomy etc.

signs of Pregnancy in Dead

1. Presence of ovum or fetus/placenta/membranes/other – products of conception
2. Uterine changes – uterus thickened in size, presence of chorionic villi
3. Presence of corpus luteum in ovary

causes of Impotence and sterility in female

1. Age
2. Malformations
3. Local and general diseases
4. Injuries and addictions
5. Psychic causes
6. Operations

Causes of impotence in the female

(1) Age- Not much effect on potency (passive agent)

Sexual desire is lost in old age

Fertile- from puberty to menopause

(2) Developmental defects and acquired defects

(3) Local diseases→

may not produce impotence but may cause sterility

eg: ovarian diseases, endometritis

(4) General diseases: do not cause impotence (passive agent)

(5)Psychic factors: it is of active nature called 'vaginismus'

Medicolegal Importance of Pregnancy

Medicolegal Importance

- Court proceedings may be suspended in advance pregnancy provided delivery is imminent or the child is likely to suffer from such attendence
- Bar to hard labour or execution.Execution may be postponed or the sentence may be commuted to life sentence
- Feigned pregnancy after husband's death so that she may be entitled to assets left by late husband on behalf of the prospective heir
- Woman blackmails person and accuses him of impregnating her,to compel for marriage
- Unmarried woman,widow,or wife living away from husband is defamed/blamed to be pregnant
- Woman alleges pregnancy to claim greater compensation from person/persons , who are responsible for her husband's death
- Woman claims more alimony,in case of divorce,on account of responsibility of perspective child
- Pregnancy suspected to be motive for suicide or murder
- Woman accused of criminal abortion,infanticide, concealment of birth or pregnancy.

Montgomery's Tubercles

Enlarged sebaceous glands that appear as raised spots in areola by the end of second month of pregnancy

Striae/Silver Lines

seen in pregnancy on breast due to stretching of skin and resultant scar formation in the Cutis due to rupture of deeper layers of skin

Linea Nigra (Dark Lines)

Vulva becomes darker in color and a dark line extends from pubis to beyond the umbilicus

Quickening

At about 4 to 4 and half months

Mother's subjective sensation of movement of fetus

Jackquemier's Sign or Chadwick's Sign

mucus membrane of vagina gradually changes from pink to violet and then deepens to blue

Striae Gravidarum or Linea Albicantes

seen on abdominal wall

Arbor Vitae

Mucosal folds in canal of uterine cervix that extends from internal os to external os

Heger's sign

6th week of pregnancy
Lower uterine segment become soft and compressible

Goodell's Sign

Softening of cervix from below upwards from 2nd month onwards due to increased vascularity
Cervix is felt as soft as lips

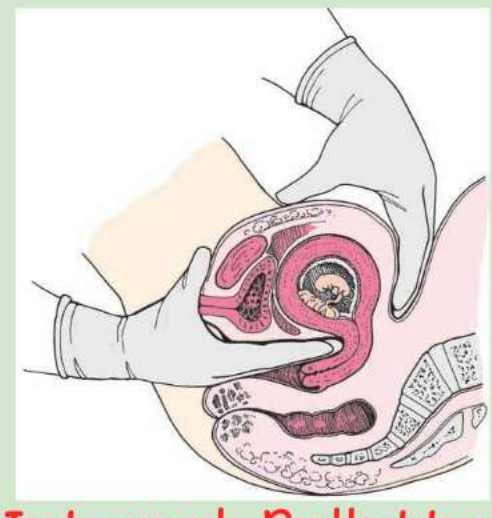
Braxton Hick's Sign

Intermittent uterine contractions and relaxations felt by palpation of abdomen after 4th month of pregnancy

Ballottement

A test to elicit the presence of fetus floating in the liquor amnii from the fourth to seventh months.

External Ballottement



Internal Ballottement

Uterine Souffle

Soft blowing murmur heard on either side of uterus by auscultation just above The inguinal ligament
from about fourth month onwards
corresponds to maternal pulse

Fetal Heart Sounds

heard from 4th – to 5th months

Superfecundation

fertilization of two separate ova which have been discharged from ovary at The same period of ovulation by two separate acts of coitus

Superfoetation

fertilization of two separate ova discharged from The ovary at different point of ovulation

occur in cases of double uterus or uterus didelphis

Atavism

Child resembles grandparents instead of parents

Sexual offences

Acts of illegal sexual intercourse with a second person or with an animal to obtain sexual gratification

Natural sexual offences

- Rape
- Incest
- Adultery

Unnatural Sexual offences

- Sodomy
- Buccal Coitus
- Tribadism
- Bestiality

Rape

Unlawful sexual intercourse by a man with a woman against her will, without her consent, or with her consent when it has been obtained by unlawful means eg fraud, putting her in fear of death or hurt, drugging, or impersonation

Incest

sexual intercourse by a man with a woman with a certain degree of blood relationship

Sodomy/Buggery

Homosexual Sodomy – Anal Intercourse between two males
Heterosexual Sodomy–Anal intercourse been male and female
Gerontophilia –when passive agent is adult
Paederasty–when passive agent is young boy (boy being known as catamite)

Buccal coitos

fellatio–oral stimulation or manipulation of penis by either male or female
Cunnilingus – oral stimulation of female genitals

Tribadism/Lesbianism

female homosexuality

Bestiality/zoophilia

sexual intercourse by human with a lower animal, either through anus or vagina

Sexual Perversions

Acts intended to result in sexual gratification without sexual intercourse

Sadism

Infliction of pain is necessary and sometimes the sole factor for sexual gratification

- Lust murder
- Necrophilia
- Necrophagia

Masochism

obtain sexual enjoyment when they receive a painful Stimulus from women

may lead to autoerotic deaths

Bondage

combination of sadism and masochism

fetichism

Sexual gratification is associated with contact and sight of certain parts of female body or even clothing, or other articles known as fetish objects

Exhibitionism

sexual desire consist principally of exhibison of genitals with or without performance of mastubatory acts in the presence of women and young girls

Transvestism/Eonism

Personality is dominated by desire to be identified with opposite sex

uranism

Sexual gratification by fingering, fondling, fellatio, cunnilingus

Voyeurism/Scoptophilia

peeping toms

Frotteurism

Compassion to rub The genitalia against another person, usually in lift or crowds

Urolagnia/Coprophilia

Sexual excitement is provoked by sight or odour of urine or feces

Pedophilia

sexual abuse of a child by an adult

Abortion

Expulsion of the products of conception at any period of gestation before full term

Legal or Justifiable Abortion

Therapeutic grounds–continuance of pregnancy would involve risk
Eugenic Grounds – Risk of child abnormalities
Humanitarian–pregnancy caused by rape
Social Grounds

Abortificent Drugs

Drugs Acting Directly on uterus

Ecbolics

increase uterine contractions
Ergot, Quinine, Cotton root bark, Pituitary extract

Emmenagogues

increase menstrual flow
Synthetic estrogens, oil of savin, borax, apiol

Drugs Acting Indirectly on uterus

Emetics
Drastic purgatives
Essential oils
Metals such as lead

Mechanical Violence for Abortion

General Violence

severe exercise, cycling, jumping from heights, rail travel
Cupping

Local Violence

1–self instrumentation
2– Abortion stick
3– syringing fluids into uterus under pressure
4–dilatation of cervix
5–rupture of membranes
6–curettage
7–use of electricity

Estimation of gestational period in dead

1-Weight of uterus

2-Length of uterus

Gestational period (Months)	Length of uterus (inches)
4	6
5	7
6	9
7	10
8	12
9	13

3- Hess formula

- **length Before the 5th month = (month)2**
  Ex. length of fetus in centimeters = (4M)2 =16cm
- **After 5th month = month x 5**
  Ex. length of fetus in centimeters = (7M) x 5 =35 cm

signs of Delivery in Dead

* The uterus is larger, thicker and heavier than the nulliparous uterus
* The walls are concave from inside forming a wider and rounded cavity (walls of nulliparous uterus are convex on inner aspect and form a cavity which is smaller in capacity and triangular in Shape
* In a parous woman, the top of the fundus is convex and on a higher level than that of the broad ligaments (in a nulliparous woman, it is at level with broad ligaments
* In a parous woman, the body is twice the length of cervix (in nulliparous woman they are about same size)
* Arbor vitae have disappeared
* The external os is enlarged and the internal os is not so well defined as that in a virgin
* The placental site is elevated and tinged with blood pigment for 6 months, and on cutting sections Endarteritis obliterans can be seen in blood vessels for years afterwards

Lochia is vaginal bleeding after childbirth. It consists of blood, mucus and uterine tissue and lasts about six weeks.

* Lochia → Last 14-15 days

* Lochia Rubra → In first 3-4 days, it is red due to fresh blood and clots

* Lochia Serosa → In next 3-4 days, it changes from red to pale or serous in nature

* Lochia alba → In next 4-5 days, the color changes to yellowish grey or slightly greenish

Impotence Quoad Hanc

A man may be potent with one particular woman but not with another

Artificial Insemination

Deposition of semen in the vagina, the cervical canal, or the uterus by instruments to bring about pregnancy which is not attained or is unattainable by sexual intercourse

Artificial Insemination Homologous

Semen fluid of husband

Artificial Insemination Donor

Seminal fluid from donor

Signs of virginity

* An intact hymen
* A normal condition of fourchette and posterior commissure
*A narrow vagina with rugose walls (wrinkled)

False Virgins

Sexual connection has taken place without rupture of hymen

Table 30.1: Distinguishing features of natural and criminal abortions

	Natural abortion	*Criminal abortion*
1. Cause	Predisposing diseases	Pregnancy in unmarried women and widows
2. Genital injuries	Not usually present	May be present
3. Foreign body in genital tract	Nii	May be present
4. Sepsis	Not usually	Frequent
5. Signs of violence on abdomen	Nil	May be present
6. Toxic drug effects	Nil	May be present
7. Foetal injuries	Nil	May be present

Station 09

Write the features of a Full term baby.
(6)

Full term baby features
Crown heel length 48–52cms
Weight is 2.5–3.5kgs
Lanugo present only over the shoulders
Vernix caseosa covers joint flexures and neck folds
Tests descended to scrotum or labia covering vulva
Umbilicus is midway between xhiphisternum and pubis symphysis

Community Medicine

S No.	Risk Factors	Related diseases
1	Outdoor air pollution	Respiratory infections, selected cardiopulmonary diseases, lung cancer
2	Indoor air pollution from solid fuel use	COPD, lower respiratory infections, lung cancer
3	Lead	Mild mental retardation, CVDs
4	Water, sanitation & hygiene	Diarrhoeal diseases, trachoma, schistosomiasis, ascariasis, trichuriasis
5	Climate change	Diarrhoeal diseases, malaria, selected unintentional injuries, protein-energy malnutrition
6	Noise	Hearing loss

Sustainable Development goals (SDGs) related to environment

- Goal 6 : Clean Water & Sanitation
- Goal 7 : Affordable & Clean energy
- Goal 13 : Climate Action

Water Pollution

- Any biological, chemical, or physical change in water quality that has a harmful effect on living organisms or makes it unsuitable for desired uses.
- Causes:

Sewage, industrial, trade & agricultural pollutants, physical pollutants and radioactive substances.

Criteria Air Pollutants

Six common air pollutants (also known as “criteria air pollutants") can harm our health and the environment. These are:

- carbon monoxide
- lead
- ground-level ozone
- particulate matter
- nitrogen dioxide
- sulfur dioxide

Water Pollution – caused by different kinds of Water impurities

1. **Natural impurities-** Comprises of
   i. **Dissolved gasses** - **Nitrogen, Carbon dioxide, Hydrogen sulphide**
   ii. **Dissolved minerals** - salts of **Calcium, Magnesium, Sodium**
   iii. **Suspended impurities** - **Clay, Silt, Sand & Mud**
   iv. **Microscopic organisms**
2. **Water pollution caused by human activities**
   i. **Urbanization & Industrialization**
   ii. **Sewage** - Contain **Organic matter & Pathogenic agents**
   iii. **Industrial waste** - Contains toxic agents like **Metal salts**
      - ***Most common cause of pollution of drinking water***
   iv. **Agricultural pollutants** - **Fertilizers & Pesticides**
   v. **Physical pollutants** - **Heat & Radioactive substances**

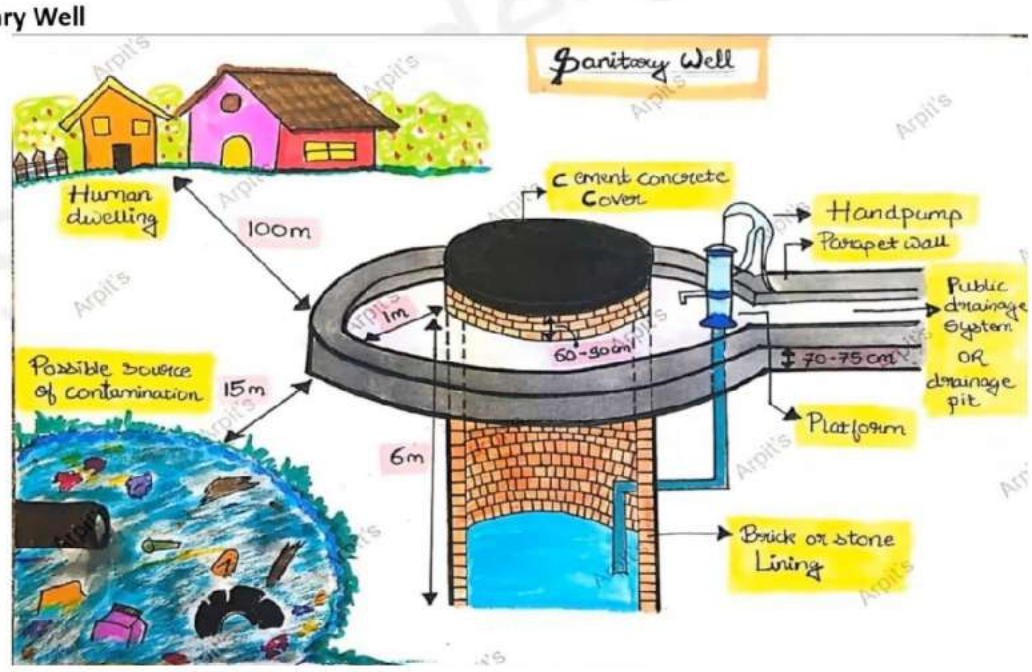
- **Indicators of Water pollution**
  i. **Total Suspended Solids (TSS)**
  ii. **Biochemical Oxygen Demand (BOD)**
  iii. **Concentration of Chlorides, Nitrogen & Phosphorus**

Sanitary Well

- one that is **Properly located**, **Well-constructed**, and **Well protected** from possible locations of contamination, so as to ensure supply of **safe water**

- **Points kept into consideration before building Sanitary Well**

1. **Location**
2. **Lining / Stone wall**
3. **Parapet wall**
4. **Platform**
5. **Drain**
6. **Covering**
7. **Hand Pump**



Diseases of Water

1. **Water Borne diseases**
   - i. **Viral**
   - ii. **Bacterial**
   - iii. **Protozoal**
   - iv. **Helminthic**
   - v. **Leptospiral**
2. ***Water Washed diseases***
3. **Water Based diseases**
4. ***Water Related diseases*** **(Water Breeding Disease)**
5. **Others**
   - **Heavy metals, Dyes, Bleaching agents, Solvents** etc.
   - **Fluoride**
   - **Hardness of water**

1. Water Borne diseases

- Occur due to **drinking contaminated water**
- Transmitted by **Faeco - Oral route**
- **Example-**

  i. **Viral**- ***Hepatitis A*** & E

  ii. **Bacterial**- ***Typhoid*** & Paratyphoid fever, ***Cholera***

  iii. **Protozoal**- Amoebiasis, Giardiasis

  iv. **Helminthic** – Roundworm, Threadworm

  v. **Leptospiral** – Weil's disease

[w.A.t.E.r]

2. *Water Washed diseases*

- Infection of **outer body surface** due to improper hygiene & inadequate use of water
- **Example- *Scabies, Trachoma***, Typhus, ***Conjunctivitis***, ***Shigellosis*** etc.

3. Water Based diseases

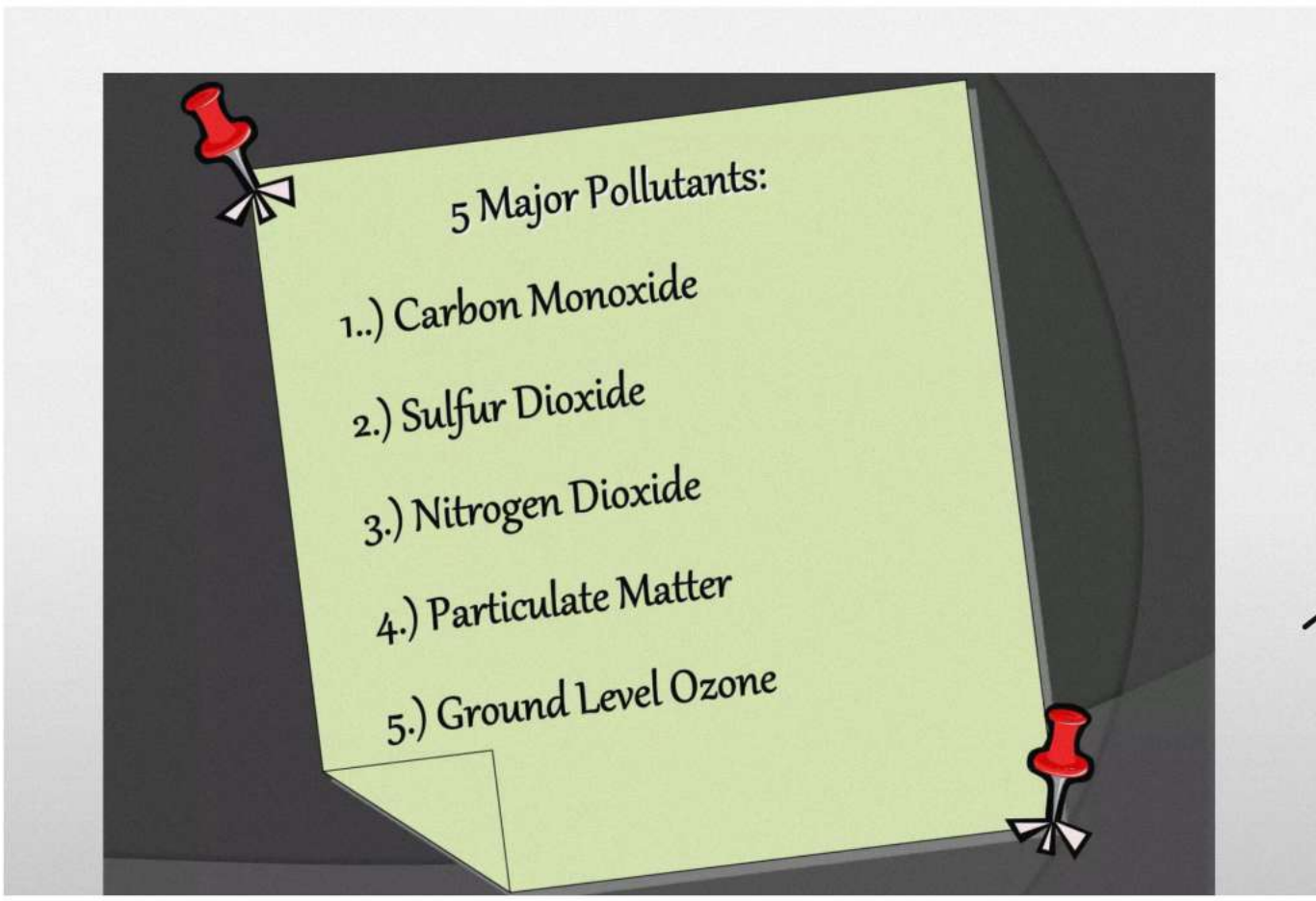
- Infection transmitted through an **Aquatic invertebrate**
- **Example-** Shistosomiasis, Dracunculiasis (Guinea worm disease)

4. *Water Related diseases* (Water Breeding Disease)

- Infections spread by **insects that depends on water**
- **Example**- Malaria, Filariasis, Dengue, ***Yellow fever***, Onchocerciasis etc.

5. Others

- **Heavy metals, Dyes, Bleaching agents, Solvents** etc.
- **Fluoride - 1mg/L Protect** against **Dental Caries** but **high-level cause mottling of Dental Enamel**
- **Hardness of water -** is beneficial against **CVD**



SMOG

- Smog is made up of mixture of those pollutants in the atmosphere .
- Combination of words smoke and fog.
- There are two types : reducing smog characterized by sulpher dioxide and particulate.
- And photochemical smog characterized by ozone and other oxidants.

Classification of Hospital Waste:

WHO CLASSIFICATION

Non-Hazardous:

Hazardous:

Waste Categories	Description and Examples
1.General Waste	No risk to human health eg:office paper,wrapper,kitchen waste,general sweeping etc.
2.Pathological Waste	Human Tissue or fluid eg:body parts,blood,body fluids etc.
3.Sharps	Sharp waste eg:Needle,scaples,knives,blades etc.
4.Infectious waste	Which may transmit bacterial,viral or parasitica disease to human being,waste suspected to contain pathogen eg:labrotory culture,tissues(swabs)bandage etc.
5.Chemical waste	Eg:Labrotory reagent,disinfectants,Film Developer
6.Radio-active waste	Eg: unused liquid from radiotherapy or lab research,contaminated glasswares etc.

Infectious Sharp Liquid General

Treatment and Final Disposal of Hospital Waste

Principles are:

- Incineration (Destruction) (Temp over 850 degree Centigrade)
- Chemical disinfection
- Render inert

TREATMENT & DISPOSAL TECHNOLOGIES

1. Incineration
2. Chemical Disinfection
3. Wet and dry thermal treatment
4. Microwave irradiation
5. Land disposal
6. Inertization

GSC TT DM

Management of solid waste

- Generation: Solid waste is generated from households, industries, and commercial establishments.
- Segregation: Waste is segregated into recyclable, non-recyclable, and hazardous categories.
- Collection: Waste is collected from different sources using trucks or collection centers.
- Transportation: Waste is transported to treatment or disposal facilities.
- Treatment: Waste is treated through recycling, composting, or waste-to-energy processes.
- Disposal: Non-recyclable waste is disposed of in properly managed landfills.
- Monitoring and Regulation: Waste management activities are monitored to ensure compliance with regulations and environmental protection.

TYPES OF DISASTER

- **Natural Disasters**
  - Meteorological
  - Topographical
  - Environmental
- **Man-made Disasters**
  - Technological
  - Industrial accidents
  - Security related

What is Disaster Management

Preparedness -- activities prior to a disaster.
Examples: preparedness plans; emergency exercises/training; warning systems.

Response -- activities during a disaster.
Examples: public warning systems; emergency operations; search and rescue.

Recovery -- activities following a disaster.
Examples: temporary housing; claims processing and grants; long-term medical care and counseling.

Mitigation - activities that reduce the effects of disasters.
Examples: building codes and zoning; vulnerability analyses; public education.

TRIAGE

- Rapid classification of the injured is done on the basis of severity of injury
- Four color code system is used

RED for high priority patients

YELLOW for medium priority

GREEN for ambulatory patients

BLACK for dead patients

Disaster Management

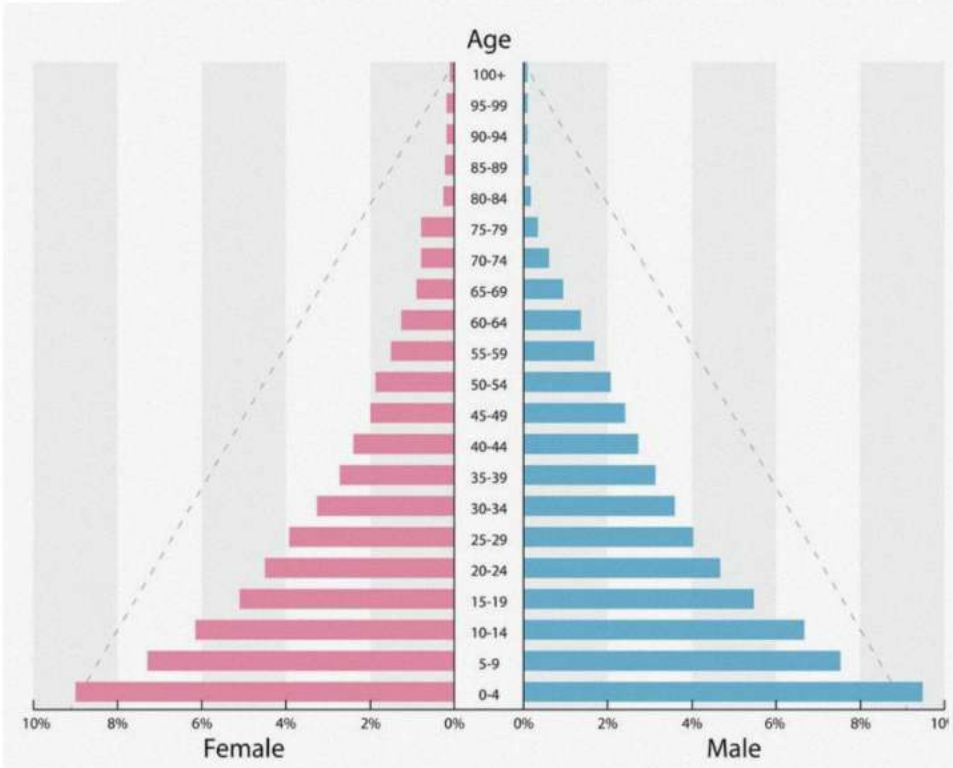
1) Prevention and Mitigation
2) Disaster preparedness
3) Disaste Response
   (a) Search, Rescue and First Aid
   (b) Evacuation measures
   (c) Field care
   (d) Triage
   (e) Tagging
   (f) Taking care of dead
4) Relief Phase

Population pyramid

Definition: a graphical representation of age and sex distribution in a population [1]

Overview of population pyramids

	Expansive pyramid	Stationary pyramid	Constrictive pyramid
Population	• Growing (e.g., rapid growth)	• Stable (e.g., slow population growth)	• Declining (e.g., zero population growth)
Age distribution	• Higher percentage of young people	• Remains constant over time	• Higher percentage of older people
Life expectancy	• Low	• Increasing	• High
Birth rate	• Very high	• Low	• Very low
Mortality rate	• High	• Low	• Low

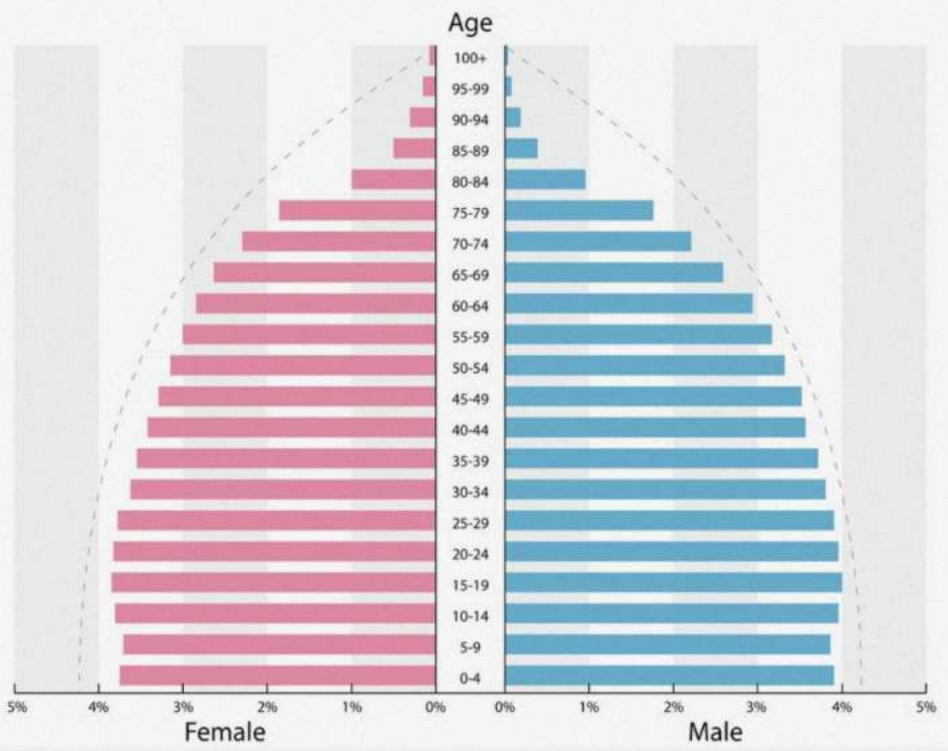


Youthful population

Expansive population pyramid - This population pyramid has a wide base, which indicates a greater proportion of individuals in younger age categories than in older age categories. This distribution reflects a population with high birth rates and low life expectancy, which indicates rapid population growth.

Expansive Pyramid

Stationary Pyramid



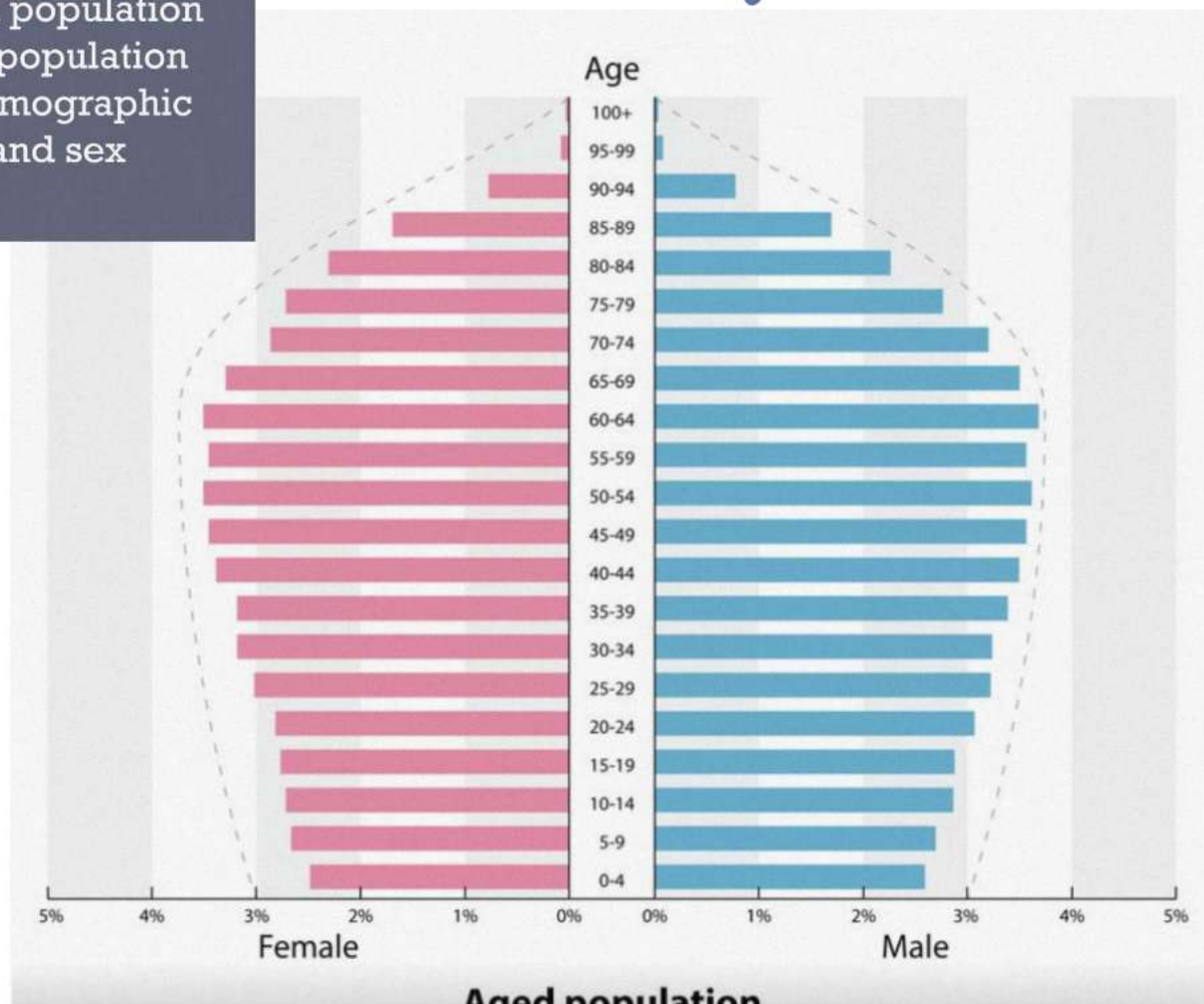
Aging population

Stationary population pyramid - This population pyramid has convex sides, with a slight narrowing at the base, indicating a slightly smaller proportion of individuals in the youngest age categories compared to those in the middle age categories. This distribution reflects a population with a decreasing birth rate and a decreasing or stable death rate, indicating slow population growth.

Population pyramid

The age-sex composition of a population is typically represented by a population pyramid which provides a demographic statement of the current age and sex distribution of a population.

Constrictive Pyramid



Aged population

Constrictive population pyramid - This population pyramid has a narrowed base, indicating a smaller proportion of individuals in the younger age categories relative to those in older categories. This distribution reflects a population with a low birth rate and high life expectancy, which indicates zero population growth or population decline.

Population pyramid

Definition: a graphical representation of age and sex distribution in a population [1]

Overview of population pyramids

	Expansive pyramid	Stationary pyramid	Constrictive pyramid
Population	• Growing (e.g., rapid growth)	• Stable (e.g., slow population growth)	• Declining (e.g., zero population growth)
Age distribution	• Higher percentage of young people	• Remains constant over time	• Higher percentage of older people
Life expectancy	• Low	• Increasing	• High
Birth rate	• Very high	• Low	• Very low
Mortality rate	• High	• Low	• Low

Endemic, epidemic, and pandemic diseases

Diseases can be classified according to their pattern of occurrence across time and geographic area.

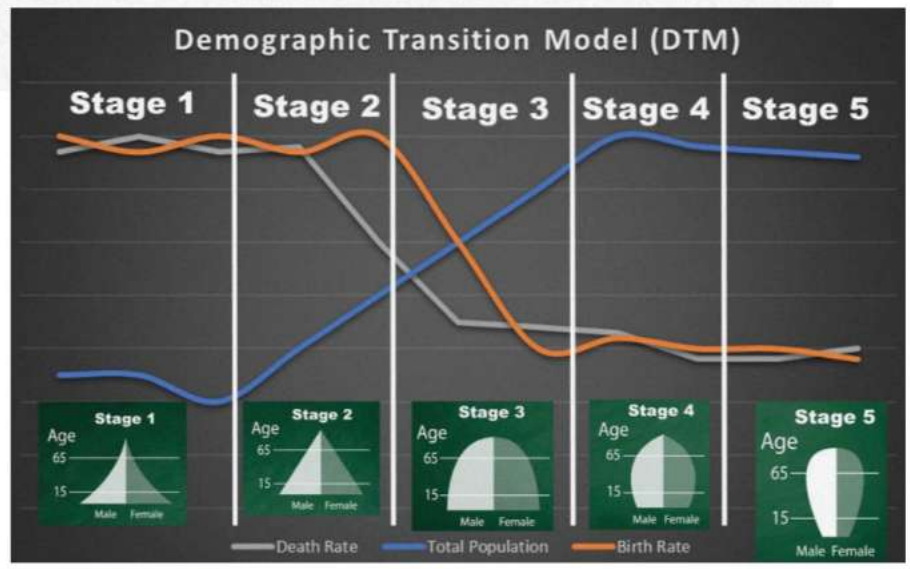
Types of diseases

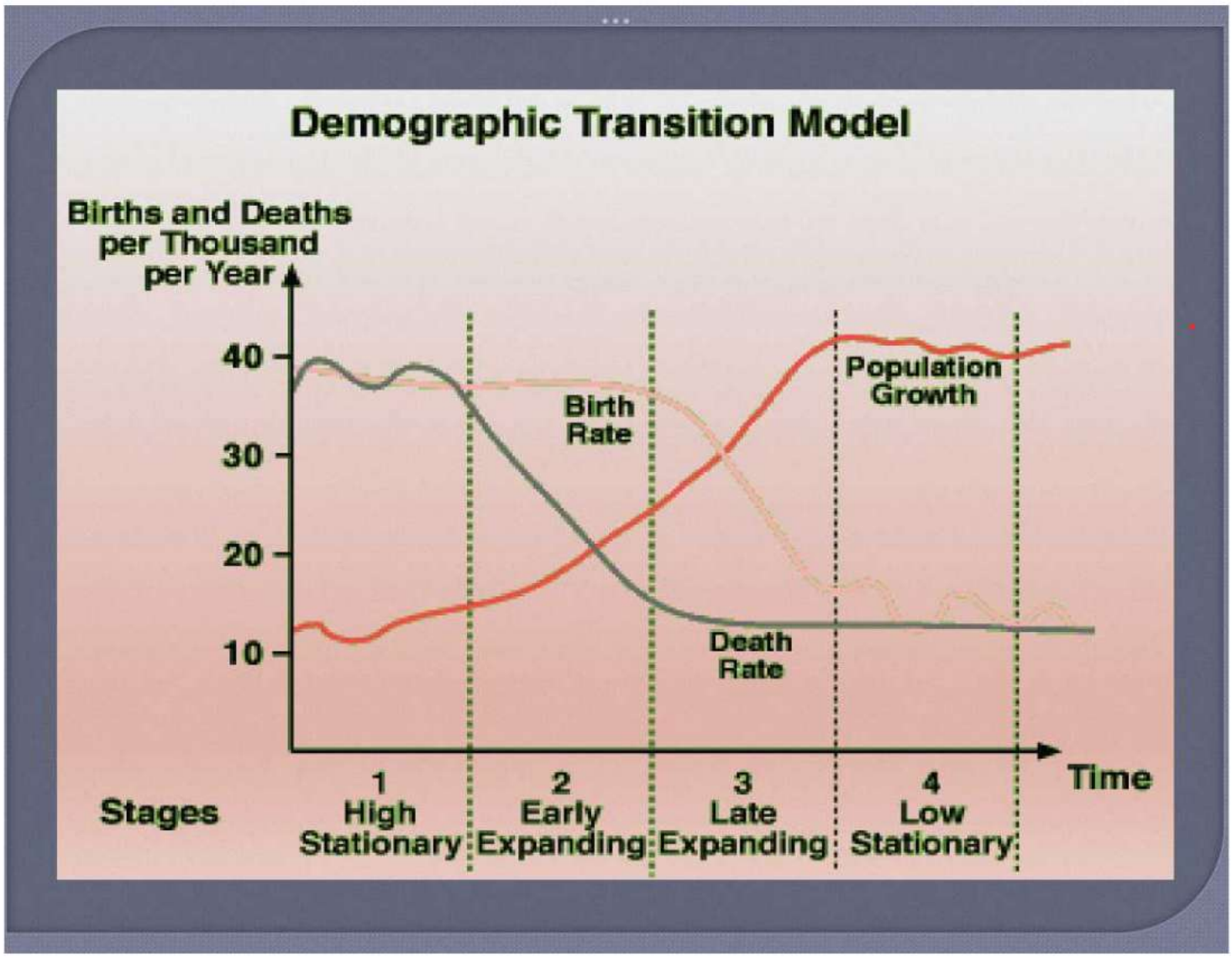
	Endemic	Epidemic	Pandemic
Definition [2]	• A disease that affects individuals at a relatively constant rate within a specific population in a given region	• A disease that affects individuals at a rapid rate within a specific population in a given region	• A disease that affects a wide geographic area, e.g., multiple countries or continents
Time	• Unlimited	• Limited	• Limited
Area	• Limited	• Limited	• Unlimited
Examples	• Malaria in parts of Africa • Yellow fever in parts of South America and Africa	• Ebola fever in West Africa (2014) • Seasonal influenza	• Spanish flu (1918/19) • COVID-19
Possible contributing factors	• Spread of disease vectors and pathogen reservoirs • Geographical conditions • Climate • Living conditions (e.g., sewage systems, housing, work)	• Infectivity of a pathogen: increased ability to multiply in a host • Living conditions (e.g., living in crowded areas) • Spread/introduction of the pathogen to a new geographical area	• Global trade and travel • Increased infectivity of a pathogen (e.g., antigenic shift)

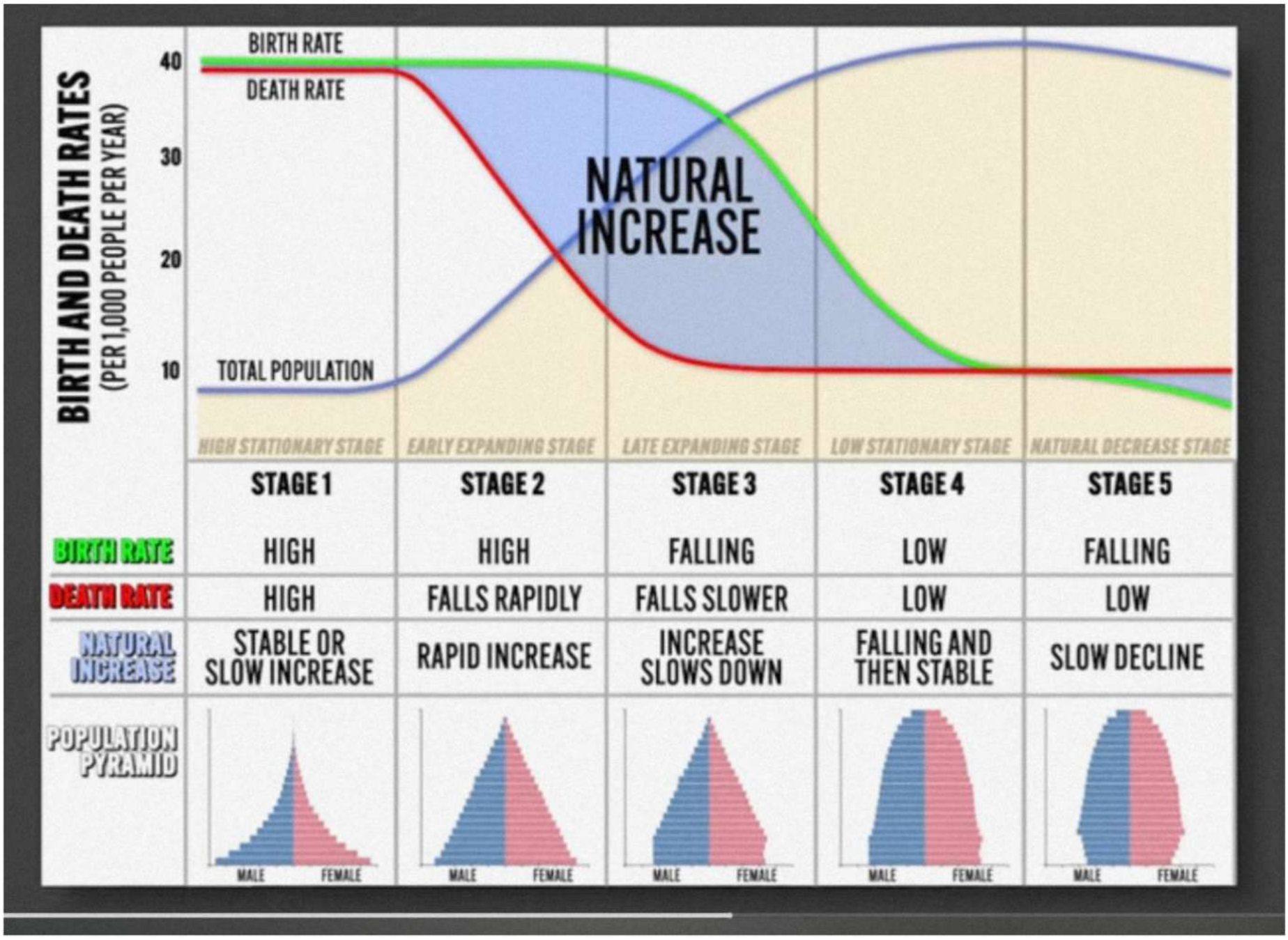
Demographic transition

- **Definition**: changes that occur in a population that goes from having high birth rates and high death rates to having low birth rates and low death rates [1]
- **Demographic Transition Model**: describes, in stages, the evolving relationship between birth and death rates in a population over time [1]
  - Stage I: high birth rates and high death rates (low or no population growth)
  - Stage II: high birth rates and decreasing death rates (high population growth)
  - Stage III: decreasing birth rates and low death rates (slowed population growth)
  - Stage IV: low birth rates and low death rates (low or no population growth)

The goal of healthy demographic transitions is to lower death rates, lower birth rates, and ensure a healthy aging population.







Stage 1 → High Stationary ↑ ↑

2 → Early Expanding ↑ ↓ (D)

3 → Late Expanding ↓(D) ↓

4 → Low Stationary ↓ ↓

5 → Declining ↓ ↓ (D)

Topic: Disaster Management

For the last few decades Pakistan is facing terrorism in all shapes. Keeping in mind terrorism is a manmade disaster.

a. What four main causes are usually present behind a manmade disaster? [2]
b. Beside terrorism what are the other types of manmade disaster? [3]
c. Give proper definition of terrorism? [2]

a. Man-made disasters are caused by human intent, negligence, error, or a failure of a man-made system

(b) 1- Terrorism
2- Nuclear, Biological, Chemical warfare
3- Vehicular Accidents
4- Deliberate explosive Attacks
5. Toxic Gas leaks, chemical/poisoning

(C) Violent acts which are intended to create fear
- They may be done for a religious, political, or ideological goal and uses illegal violence

TERRORISM

- Violent action targeting civilians exclusively
- Use /threatened use of violence for the purpose of creating fear in order to achieve a political, religious or ideological goal

DEPTT OF COMMUNITYMEDICINE **OSPE EXAMINATION**

Question no 13 **Time 4 min**

Time 4 min

A **B**

1. Name disease in seen in picture A & B (1)
2. Identify the pictures A and B and name the disease. (2)
3. Give at least two causes for the above disease. (1)
4. Write down the preventive measures. (3)

2- (A) Bowing of legs
(B) Rickettsia
3.- Vit D and Ca^{++} deficiency
4 - Vit D supplements
calcium supplements

Topic: Occupational Health

Picture 1: shows a famous industry in District Charsadda

A man 40 years of age is working in the above industry for the last 20 years, reported to you with complaint of breathlessness, cough and hemoptysis. X. ray chest shows mottling in lung shadow.

1. What is the likely diagnosis and cause of the disease? 01
2. Enumerate the two most common complications of this condition 02
3. What particular measures would you recommend for prevention of this condition in industrial workers? 04

• Man working in sugar cane industry and has mottle appearance of lungs

1- Bagassosis (can fiber / dust)

2- Complications:
- Emphysema
- Bronchiectasis

3. Preventive Measures
- Dust Control measures
- Personal protective equipment (PPE)
- Regular medical checkups
-

Dept of Com Med KGMC

Annual OSPE 2015

Topic: Nutrition

(Total marks 7)

Question:

(Time 4 min)

a) Identify the abnormal finding in the above eye? (1.5)

b) State which micronutrient deficiency causes this condition? (1.5)

c) State which age group is most vulnerable? (01)

d) Write down WHO recommendations to prevent this condition? (03)

a- Xerophthalmia with Bitot spots and conjunctivitis

b- Vitamin A deficiency

c- Children

d- WHO Recommendation → A high dose Vit A Supplementation every 4-6 months for all children between ages of 6 and 59 months living in areas where Vit A Deficiency is a public health problem

Topic: IMNCI

Rania, a 24-month old girl was brought to a health facility by her mother. The mother told that she is was very irritable and was crying, coughing and rubbing her ears for the last 3 days.
The mother told that Rania was breastfeed 3 – 4 times in 24 hours; she also gives her diluted cow's milk by feeding bottle 2 times per day.
The mother also told that she gives no other food and her feeding has not changed during the illness.

On examination she weighs 7 kg, her temperature is 36.2°C.
She has no GENERAL DANGER SIGNS. Her respiratory rate is 37 breaths per minute, no chest in drawing, no stridor and no wheeze. She does not have diarrhea, throat problem. She has no swelling behind the ears and no pus draining from the ear. She has visible severe wasting but no oedema on both feet. Her palms appear very pale, almost white.

1. **State how you will classify Rania's cough?** (1)
2. **Write down classification for Rania's ear problem?** (1)
3. **Write down your classification for Rania's nutritional status?** (1)
4. **What is your classification for Rania's anaemia?** (1)
5. **Which of the following should be included in the treatment plan for Rania?** (2)

Weight → 7 kg
Temp → 36°
RR → 37 breaths per min

Question no;
Key:

1. NO PNEUMONIA: COUGH OR COLD
2. NO EAR INFECTION
3. SEVERE MALNUTRITION
- VERY LOW WEIGHT
4. SEVERE ANAEMIA
5.
- Ask mother to breastfeed Rania to prevent low blood sugar
- Vitamin A
- Urgent referral to hospital

6
- Infrequent breastfeeding
- Giving no other food
- Feeding by bottle
- Using cow's milk
- Giving no other fluids

Topic: Communicable disease

The ongoing **Haiti cholera outbreak** is the worst epidemic of cholera in recent history. It had killed at least 8,231 Haitians and hospitalized hundreds of thousands more while spreading to neighboring countries.

1. Define cholera? [1]
2. Write a few lines about cholera vaccine? [2]
3. Which type of complication and its treatment is shown in the above picture. [1]
4. How can cholera be prevented? [2]
5. Is cholera vaccination part of national immunization programme? [1]

1- Cholera is a highly infectious and often fatal diarrheal disease caused by bacterium vibrio cholera.

2- Two Types of oral Cholera vaccines are Available
(a) Dukoral → A two dose vaccine that provides protection for 2-3 years
(b) Sanchol → A two dose vaccine that provides protection for 3-5 years

3- Fluid loss leading to dehydration
Mildly Dehydrated patient → ORS
severely Dehydrated patient → IV Fluids

4- (Cholera prevention on next page)

5- No

Cholera Prevention

Individual Precautions

- Drink safe water
- Wash hands frequently
- Use proper sanitation
- Avoid close contact
- Avoid eating raw or undercooked seafood

Community Based Interventions

- Improve access to safe water
- Improve sanitation
- Promote hygeine
- Implement waste management
- Conduct public awareness campaign
- Get vaccinated

...KGMC

Annual OSPE 2(

Topic: Disaster Management

Question: 4

(Total marks 7)

(Time 4 min)

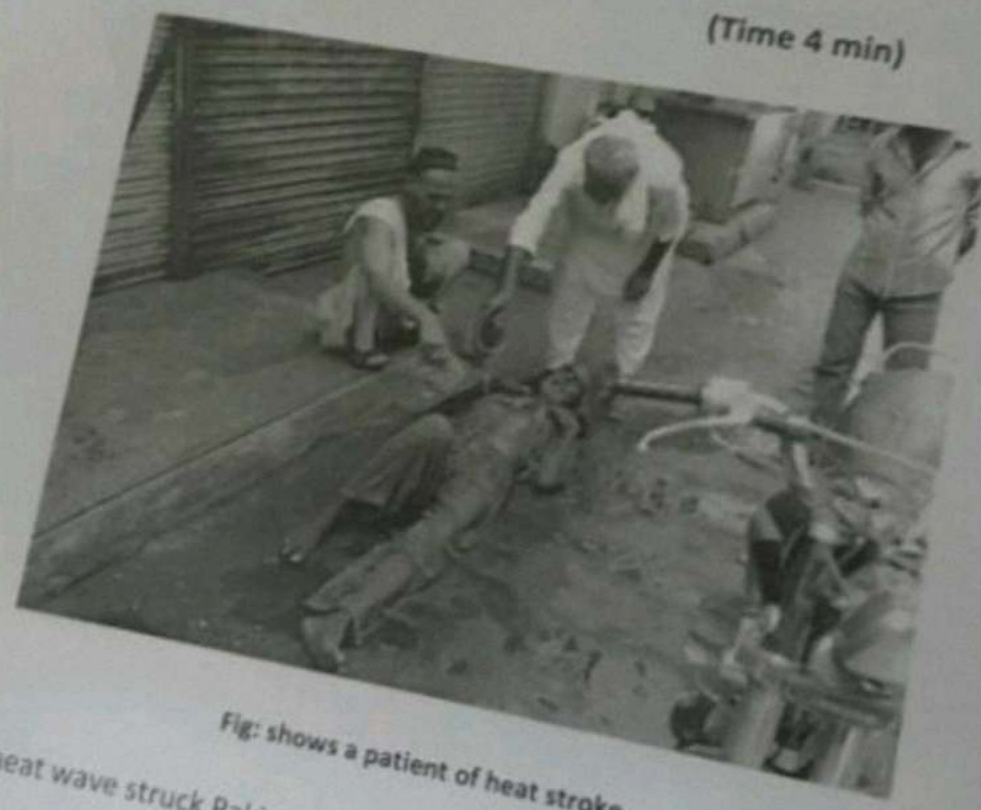


Fig: shows a patient of heat stroke

A severe heat wave struck Pakistan in June 2015, mostly affecting Karachi and Sind, causing more than 3,000 deaths.

a) State the probable causes of this heat wave

b) Describe briefly why so much causalities had occurred (03)

c) Write down the most appropriate way for the awareness of general public. (03)

(01)

a- Global climate change aggravated by deforestation, rapid urbanization and expansion of super highways

b. 1. Lack of management
2- Lack of mass education

c- Mass education through electronic media

OSPE Station

Community Medicine

Time; 05 min

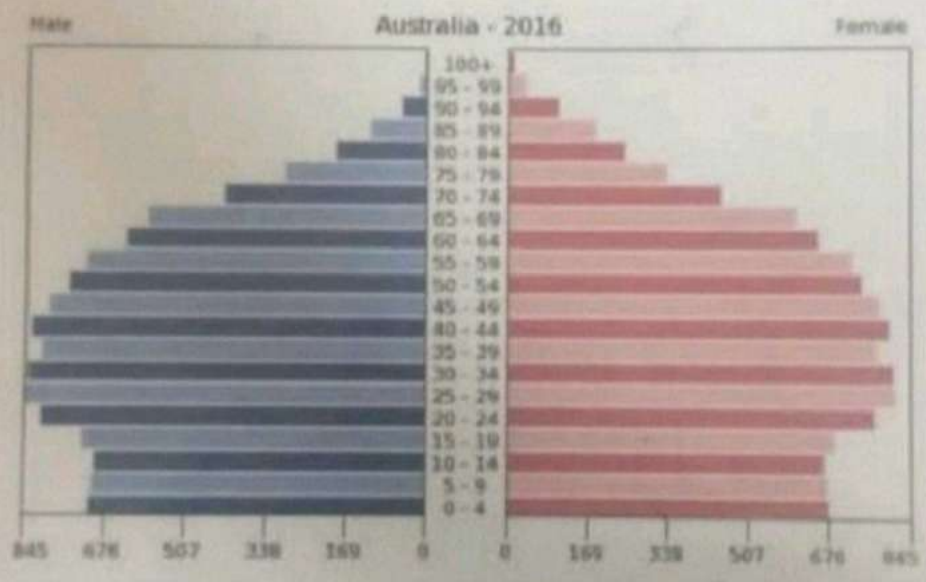
Total marks; 07

Question no;

Topic: Demographic Transition

Question

This figure below shows population pyramid of Australia.



Source: CIA World Factbook https://www.cia.gov/library/publications/the-world-factbook

Your task is to:

1. Describe four demographic features of this population? (04)
2. Draw different phases of demographic transition, and identify in which stage Australia is falling below the cycle/range demographic transition? (03)

This is a Constrictive Pyramid

A. 1- Population: Declining
2. Age Distribution → higher % of older people
3- Life Expectancy → High
4- Birth Rate → very Low
5. Mortality Rate → Low
6- Male and female population almost the same

A lady of age 28 years had 3 daughters and one son, her last baby is of 06 months and is breast fed. She does not suffer from any metabolic disorder. She wants no more children but her husband does not agree with her, now

a) What possible method of contraception you will advise her? (02)

b) What methods of contraception are absolutely contraindicated? (02)

c) Enlist clinical methods of contraception? (03)

1- IUD or barrier methods

2. Tubal Ligation
   Hormonal methods

3. • Hormonal → pills, injectables, patches
   • Barrier → Condoms, Diaphragm, Spermicide cream jellies
   • IUD Devices
   • Tubal Ligation, Vasectomy
   • Natural methods → Calendar method, Temperature method, cervical mucous method

Topic: Disaster Management

The above picture is taken after a disaster which took about 86000 human lives and an economical loss of about 5 billion us dollars?

1. Which type of disaster is shown in the above picture? [1]
2. What mitigation measures should be taken in an area after such a disaster? [2]
3. Which factors might have caused such a huge human loss? [2]
4. What psychological effects did the survivors of that incident suffer? [2]

4- • PTSD
- Flashbacks
- Fear of aftershocks
- Generalized anxiety
- Survivor's guilt
- Sleep disturbances

1- Natural Disaster: Earthquake

2- • Search and Rescue
- Assess building safety
- Provide medical assistance
- Establish communication networks

3- • High Magnitude of earthquake
- Urban areas with poorly constructed buildings and inadequate infrastructure
- Poor building design
- Geological faults
- Lack of early warning signs

Interactive station

Topic: Non-Communicable Diseases

A 58 years old gentleman presented to you with a 2 days history of headache. He is a businessman with a stressful and sedentary lifestyle. He smokes 20 cigarettes a day. He has a strong family history of hypertension and cardiovascular diseases. On examination he is obese with a body mass index (BMI) of 32Kg/m2, a blood pressure of 140/90 mmHg. He is not on any treatment. He wants treatment for hypertension as he has some concerns.

Question:

Your tasks are to: counsel the patient and address his concerns. (7)

Life Style modifications
- Regular physical activity
- Maintain a healthy weight
- Manage stress

Dietary Changes
- Reduce sodium intake
- increase potassium intake
- Limit alcohol consumption
- Follow the DASH diet

Regular Monitoring of BP
Quit Smoking
Low caffeine intake

Total marks: 07

Question no;
Topic: Reproductive Health

Answer the following questions by using the pictures provided to you.

1. A lady of 45 years having 04 sons and 03 daughters is hypertensive wants to go for contraception, her husband is not willing for undergoing any procedure, which method is best suitable for her.
2. A lady of age 28 years have 3 daughters and one son, her last baby is of 06 months and is breast fed, she does not suffer from any metabolic disorder. Which methods of contraception you will advise her.
3. A lady of age 23 years is a working woman; having one son who is breast fed. She wants to go for contraception for at least 03 years; her husband is willing for this. What method you will advise her.
4. A young lady of 27 years of age with two sons and 01 daughter, she is scared of oral contraceptive pills but is rich enough and can afford expensive methods of contraception. Which method you will advise her.

1- IUD, TAH-BSO

2- Progestin only pill

3- IUD

4- IUD

Topic: Reproductive Health

Instructions: Interpret the graph in the light of questions mentioned below.

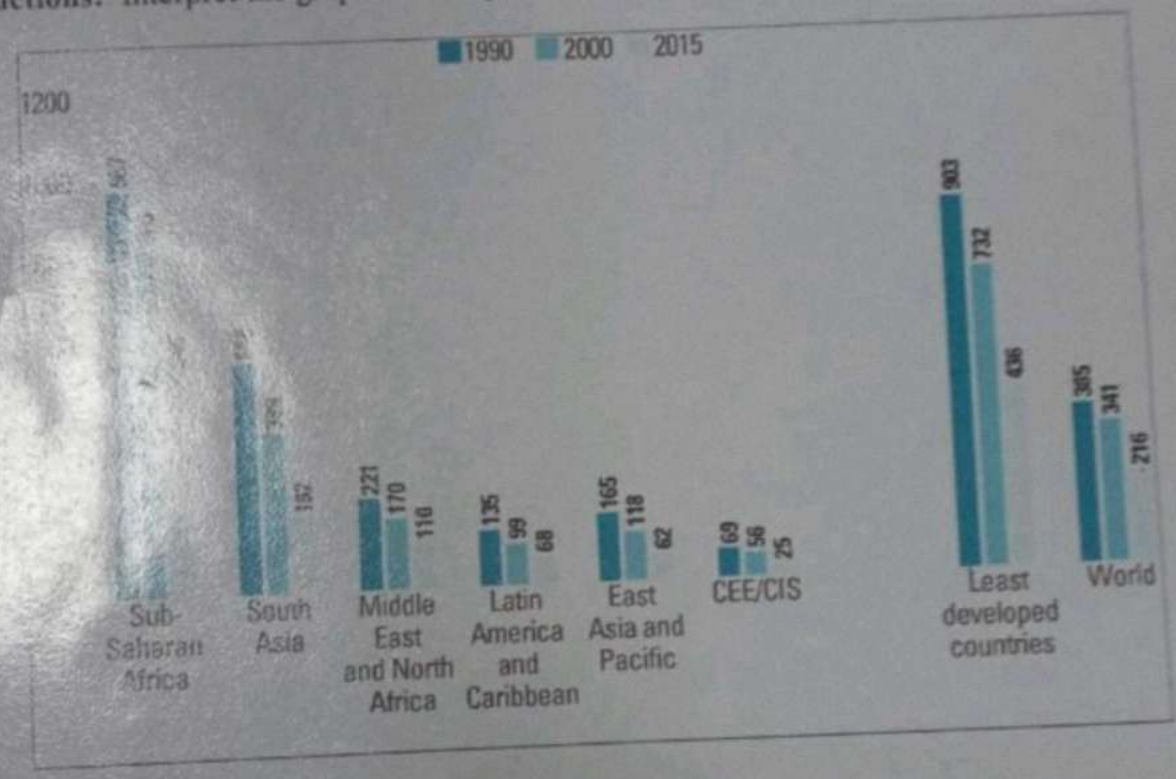


Figure: UNICEF Data of Maternal Mortality

Source: World Health Organization, UNICEF, United Nations Population Fund and The World Bank, *Trends in Maternal Mortality: 1990 to 2015*, WHO, Geneva, 2015.

Questions:

1. What does the given graph indicate? 01
2. Which country has the highest maternal mortality? 01
3. Which country has the least maternal mortality? 01
4. Mention the years in which the data was taken? 01
5. How much the maternal mortality has reduced worldwide? 02

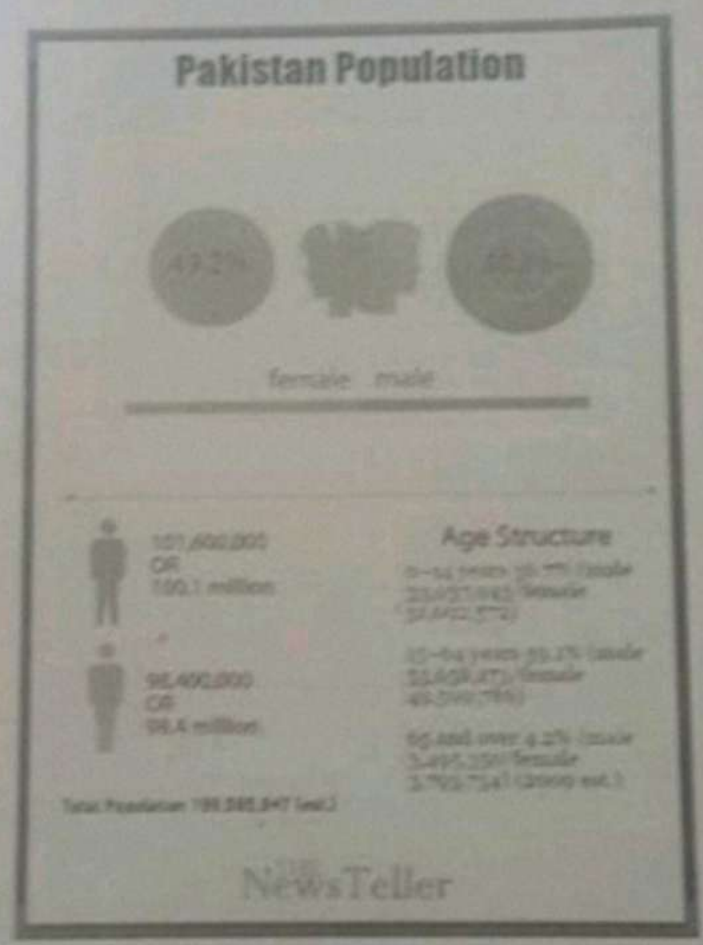
Final professional exam 2019

1. Graph indicates MMR rates in different areas throughout the years
2. Sub Saharan Africa
3. CEE/CIS
4. 1990 2000 2015

Topic: Medical Demography

Following picture is showing the population demographic profile of Pakistan' (2009). Based on this data;

1. Calculate sex ratio? 03
2. Calculate dependency ratio? 04



Sex Ratio

The overall sex ratio is simply the ratio of males to females in the population and is calculated by taking the number of males in a population and dividing it by the number of females in the same population. It is usually expressed as the number of males per 100 females:

$$\text{Sex Ratio} = \frac{\text{number of males}}{\text{number of females}} \times 100$$

No. of males per 100 females

Sex Ratio

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$$\text{Sex Ratio} = \frac{\text{number of males}}{\text{number of females}} \times 100$$

Dependency Ratio

Dependency ratio is an index summarizing an age distribution.
Strictly, this is the ratio of population who are economically not active. However, due to the difficulties in defining economic activity in many countries especially when international comparisons are to be made, a ratio of age group is used instead, such as:

$$\text{Dependency Ratio} = \frac{\text{Pop. of children} \downarrow 15 + \text{Elderly 65 \&} \uparrow}{\text{working age population 15-64 yr}} \times 100$$

Topic: Nutrition

Mr. Khalid is a bank manager who visits a nutritionist because he is concerned about his physical health. His mother has recently passed away of heart disease. On enquiring about his daily habits Mr. Khalid explained that he spent most of his watching television and using a mobile phone/computer for much of the day. He loves to eat fried things, sweets, dessert, and fizzy drinks and very little vegetables and fruits. He is a smoker and has been smoking for the last 6 years. His height is 1.60 meter & weight is 80 Kg.

a. Calculate body mass index (BMI) of Mr. Khalid. (02)
b. Interpret the result. (01)
c. Devise a healthy lifestyle plan for Mr. Khalid using healthy food pyramid as reference. (04)

	Food groups & personal habits	Quantity Per day	Recommendations
1.	Grain	5-6 Serving	Choose whole grains like brown rice and whole wheat bread
2.	Vegetables	3-5 serving	↑ intake of leafy greens, carrots and bell peppers
3.	Fruits	2-4 Serving	Eat fresh fruits like apples, berries, oranges instead of sugary snacks
4.	Milk	2-3 Serving	opt for low fat or skim milk or dairy products
5.	Meat and beans	2-3 serving	Eat lean meats like chicken and fish
6.	Oils/ fat	Limited intake	Use healthy fats like olive oil
7.	Sugar and sweets	Very Limited	Reduce intake of desserts, soft drinks
8.	Salts	Limited	Reduce salt intake to lower risk of HTN
9.	Exercise	30-35 min/day	Engage in activities like walking, jogging
10.	Smoking	Quit Completely	seek medical help or counselling to quit smoking

Pre-Prof Exam 2019, Department of Community Medicine, KGMC.

- $BMI = \frac{\text{Weight (in kg)}}{\text{Height (in m}^2\text{)}} = \frac{80}{(1.6)^2} = \frac{80}{2.56} = 31.25$

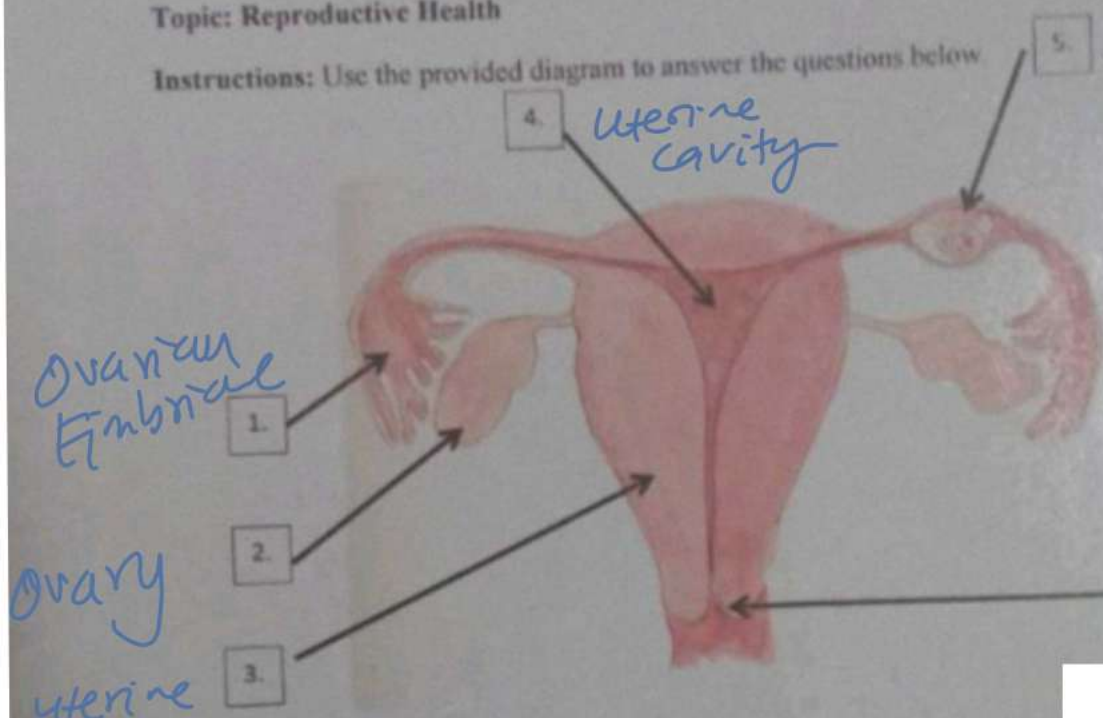
Time: 05 min

Total marks: 07

OSPE Station

Topic: Reproductive Health

Instructions: Use the provided diagram to answer the questions below



→ Ectopic pregnancy

Uterine cavity

Ovarian Embrace

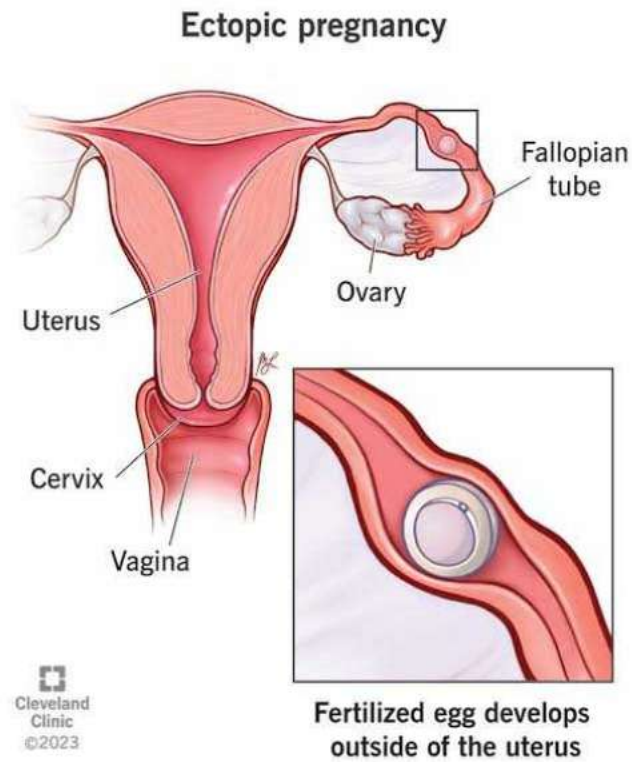
Ovary

uterine wall ?

cervix

Questions:

1. Label the above diagram (as shown by arrows)
2. What is the likely diagnosis?
3. What is the management for this condition?



2- Ectopic pregnancy ?

3- Management on next page

Managent of ectopic pregnancy

Supportive Care for All patients

Pain management
Prenatal and contraceptive counseling once treatment is complete
Anti-D immunoglobulin for Rh-negative patients who present with bleeding

Stable Patients

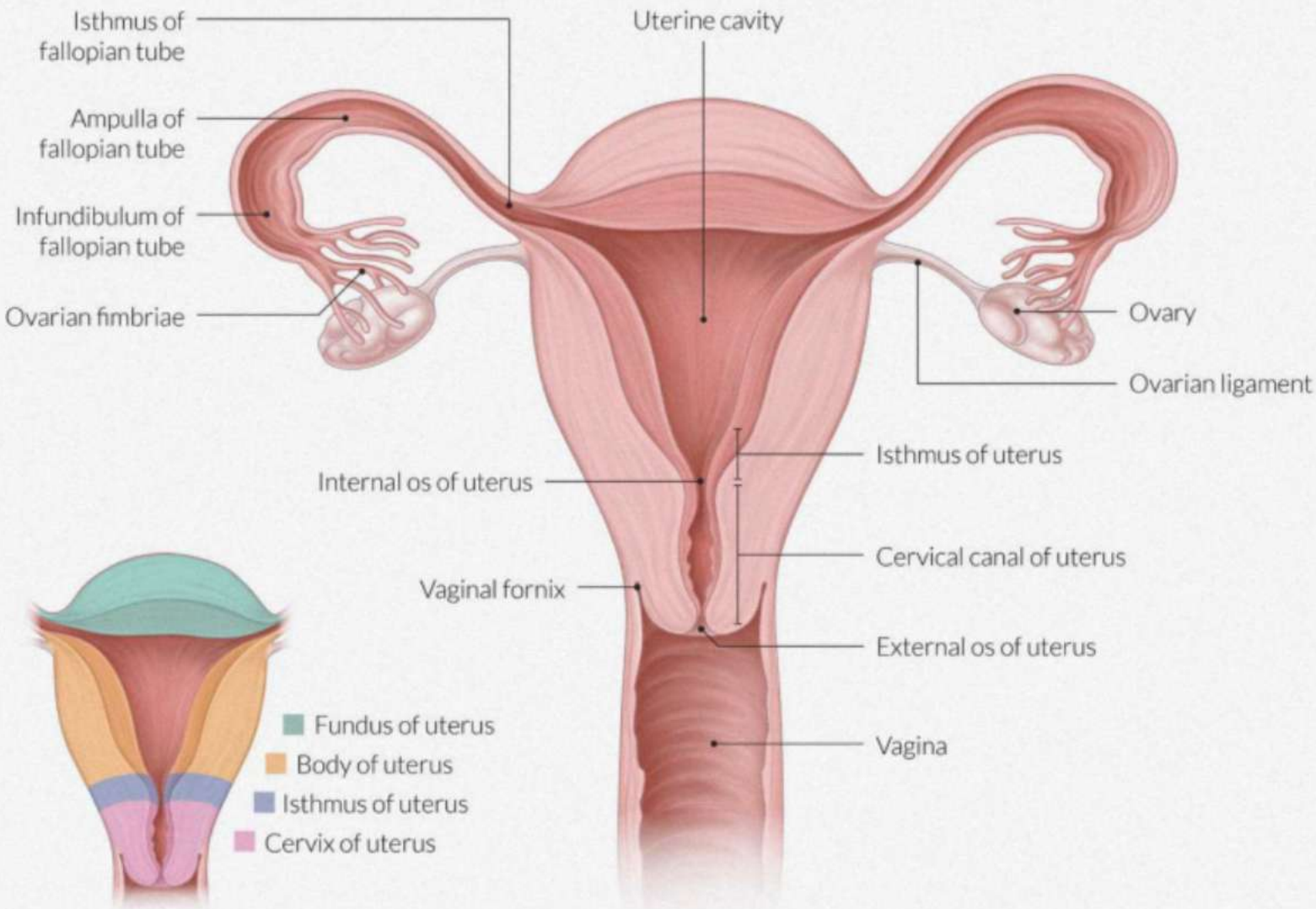
- Medical Therapy → Methotrexate
- Non Surgical managent → Laparoscopy

Unstable Patients

- Salpingectomy i.e partial or complete removal of affected fallopian tube

If the patient desires future pregnancies: Evaluate the status of the contralateral fallopian tube before salpingectomy.

If the patient does not desire future pregnancies: Bilateral salpingectomy may be performed.


Isthmus of fallopian tube
Ampulla of fallopian tube
Infundibulum of fallopian tube
Ovarian fimbriae
Uterine cavity
Ovary
Ovarian ligament
Isthmus of uterus
Internal os of uterus
Cervical canal of uterus
Vaginal fornix
External os of uterus
Vagina
Fundus of uterus
Body of uterus
Isthmus of uterus
Cervix of uterus

Time: 05 min

Total marks: 07

OSPE Station

Topic: IMNCI

Instructions: Read the following scenario carefully. (You have been given an empty Performa). Your task is:

Anwar is a 24 months old child has been coughing for 7 days and having trouble breathing and diarrhea for 3 days. His weight is 13 kg and temperature 37.5 C.
Anwar is not able to drink, has not been vomiting. He is not having convulsions during this illness but seem unusually sleepy. He also does not look at his mother when she talks. Anwar stare blankly and appear not to notice what is going on-around him.
His breathing rate is 42 breaths per minute. There is no chest in-drawing and stridor.
Anwar has a diarrhea for 3 days but there is no blood in it. His eyes were sunken and skin pinch goes back slowly.

Questions/ Tasks:

1. Fill this Proforma — 01
2. Classify this sick child according to given IMNCI guidelines in this scenario — 02+02+02

ic: IMNCI (Role play) (Total marks 7)

: 1 Weight age

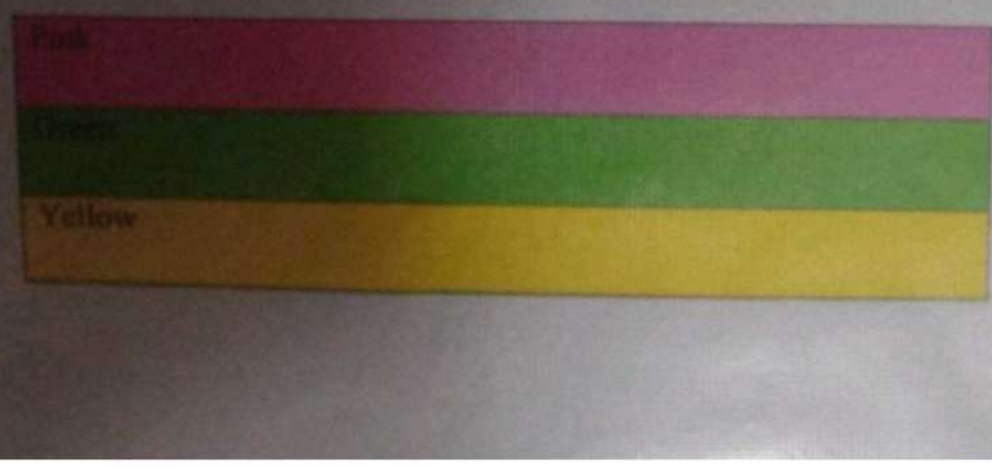
	Counsel the mother on the 3 Rules of Home Treatment:	
.	GIVE EXTRA FLUID (ORS or clean water as much as the child will take)	
	- Teach mother how to prepare and give ORS	0.5
	- Give the mother 2 packets of ORS to use at home	0.5
	- Show the mother how much fluid to give in addition to usual fluid intake. (2years or more 100 – 200 ml after each motion	0.5
	- Tell mother give sips from a cup, if the child vomits continue , but more slowly	0.5
	- Continue giving extra fluid till the diarrhea stops.	0.5
	- Give zinc suspension 1tsf OD for 10 days	
2.	Continue breast feeding. Fluid based foods like soup, rice, yoghurt	02
3.	When to return:	
	- Drinking poorly or not able to drink	0.5
	- Becomes sicker	0.5
	- Develops fever	0.5
	- Blood in stool	0.5
	Total marks obtained	

Topic: IMNCI

Instruction: Two case scenarios has been provided, apply the correct color code category to each child from the two scenarios provided. (3.5 marks each)

Case scenario 1:
Ali a 4 months old child is brought to Basic Health Unit Regi Lalma by his mother. The mother complains that he has a fever for the last 2 days and since this morning he is not able to breastfeed.

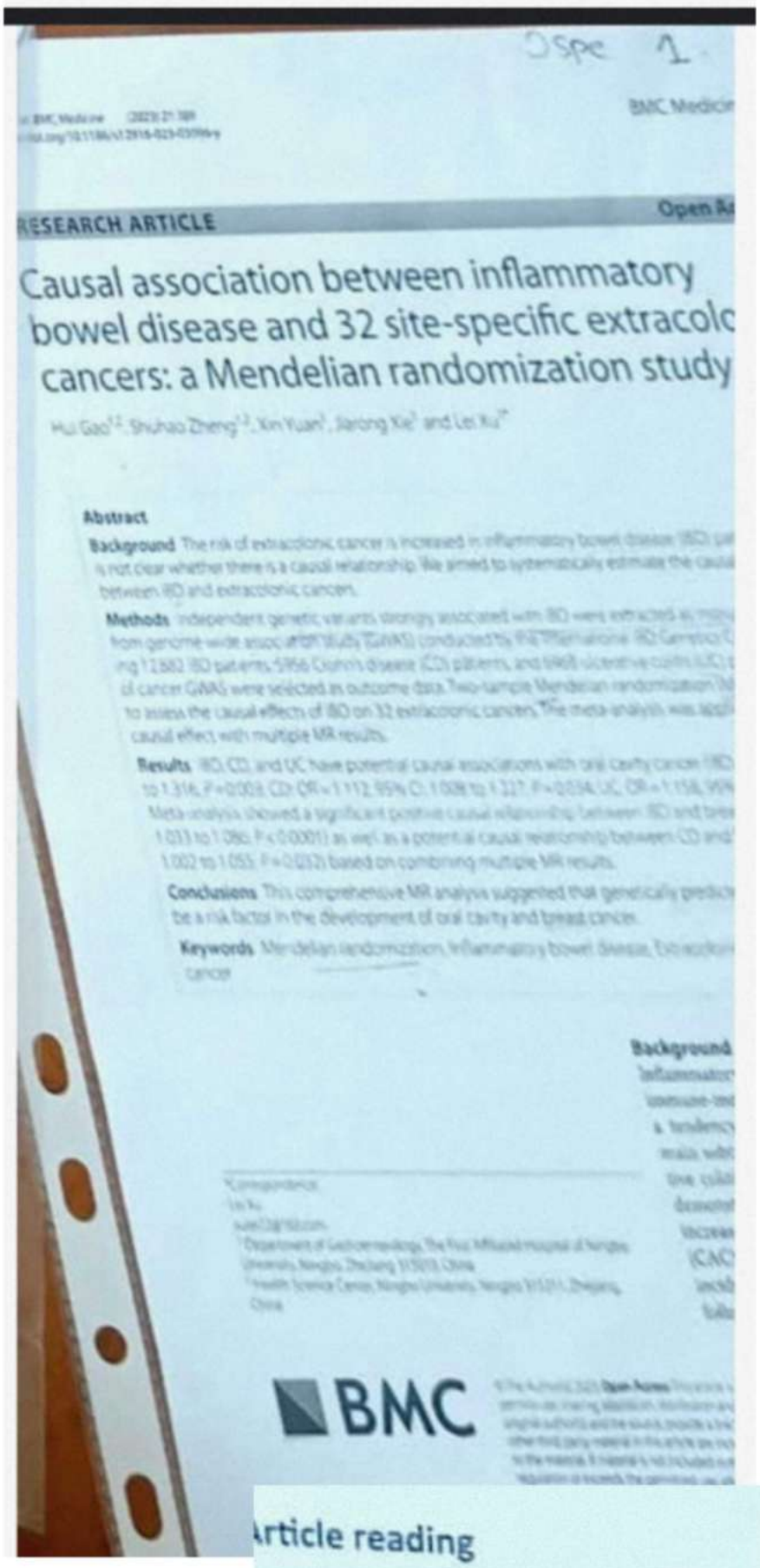
Case scenario 2:
Shabir a 10 months old child is brought to Basic Health Unit Regi Lalma by his mother. The mother complains that he has a cough for the last three days. On examination his breathing rate is 46 breaths per minute and chest is indrawn.



Principles of integrated care (Contd. .)

A combination of individual signs leads to a child's classification(s) rather than diagnosis.

- *needs urgent hospital referral or admission (classifies as and colour coded pink)*
- *needs specific medical Rx or advice (classified as and colour coded yellow)*
- *can be managed at home (classified as and colour coded green)*



RESEARCH ARTICLE

Causal association between inflammatory bowel disease and 32 site-specific extracolc cancers: a Mendelian randomization study

Abstract

Background

Methods

Results

Conclusions

Keywords

Background

BMC

* Corresponding Author are The one communicating with journals for publishing the article.

Generally marked with asterisk (*) and their email is also provided

Article reading

Module: Research (PRIME)

ve been given first page of a research article. Go through it and answer following
n.

Identify the objective of the study? (2)
Identify MESH terms in this abstract? (2)
Which one from authors listed is corresponding author? (2)
What study design was used? (2)
What was the conclusion of the study? (2)

Schedule of administration of Tetanus Toxoid

for women of childbearing age

Dose	When to give	Expected duration of protection
TT 1	at first contact or as early as possible in pregnancy	none
TT 2	at least 4 weeks after TT 1	1 - 3 years
TT 3	at least 6 months after TT 2	5 years
TT 4	at least one year after TT 3 or during subsequent pregnancy	10 years
TT 5	at least one year after TT 4 or during subsequent pregnancy	All childbearing years

Tetanus Toxoid

TT1	At first contact, or as soon as possible during pregnancy
TT2	At least four weeks after TT1
TT3	At least six months after TT2 or during subsequent pregnancy
TT4	At least one year after TT3 or during subsequent pregnancy
TT5	At least one year after TT4 or during subsequent pregnancy

Department of Public Health & Community Medicine (Block L; year 2022)

OSPE # 2

Q 1: Deficiency of which essential vitamin leads to development of the conditions shown in the above image? (1)

Q 2: What are the sources of the above said vitamin? (2)

Q 3: What are the functions of this vitamin? (2)

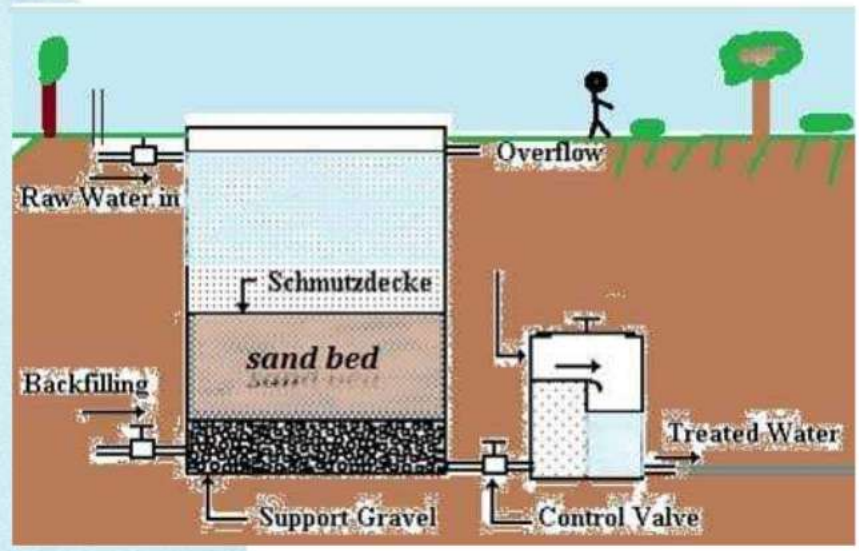
Q 4: Name the above shown conditions (1)

1- Vitamin K deficiency

2- Spinach, kale, liver (esp chicken liver), egg yolks

3- Production of clotting factors in liver

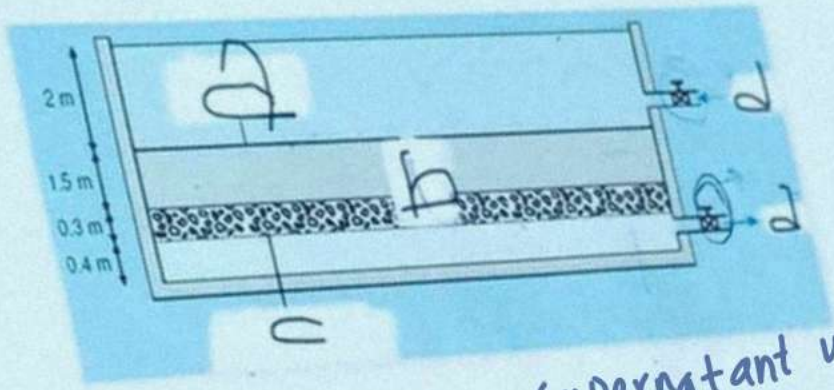
4. Ecchymoses



artment of Public Health & Community Medicine (Block L; year 2022)

OSPE # 14

A. Label the diagram



a. (1 mark) Supernatant water

b. (1 mark) Vital Layer

c. (1 mark) Sand bed

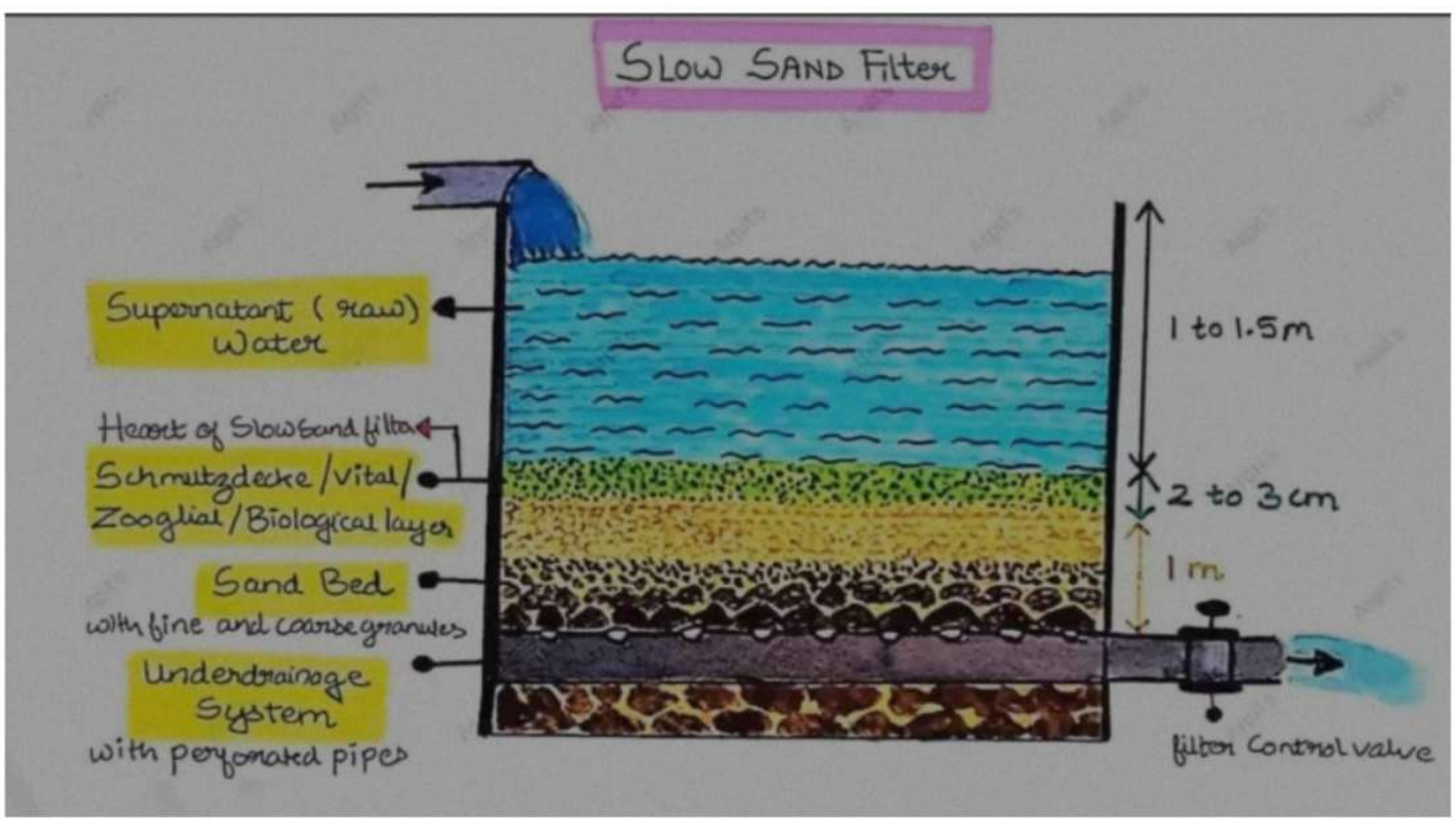
d. (0.5+0.5 mark)

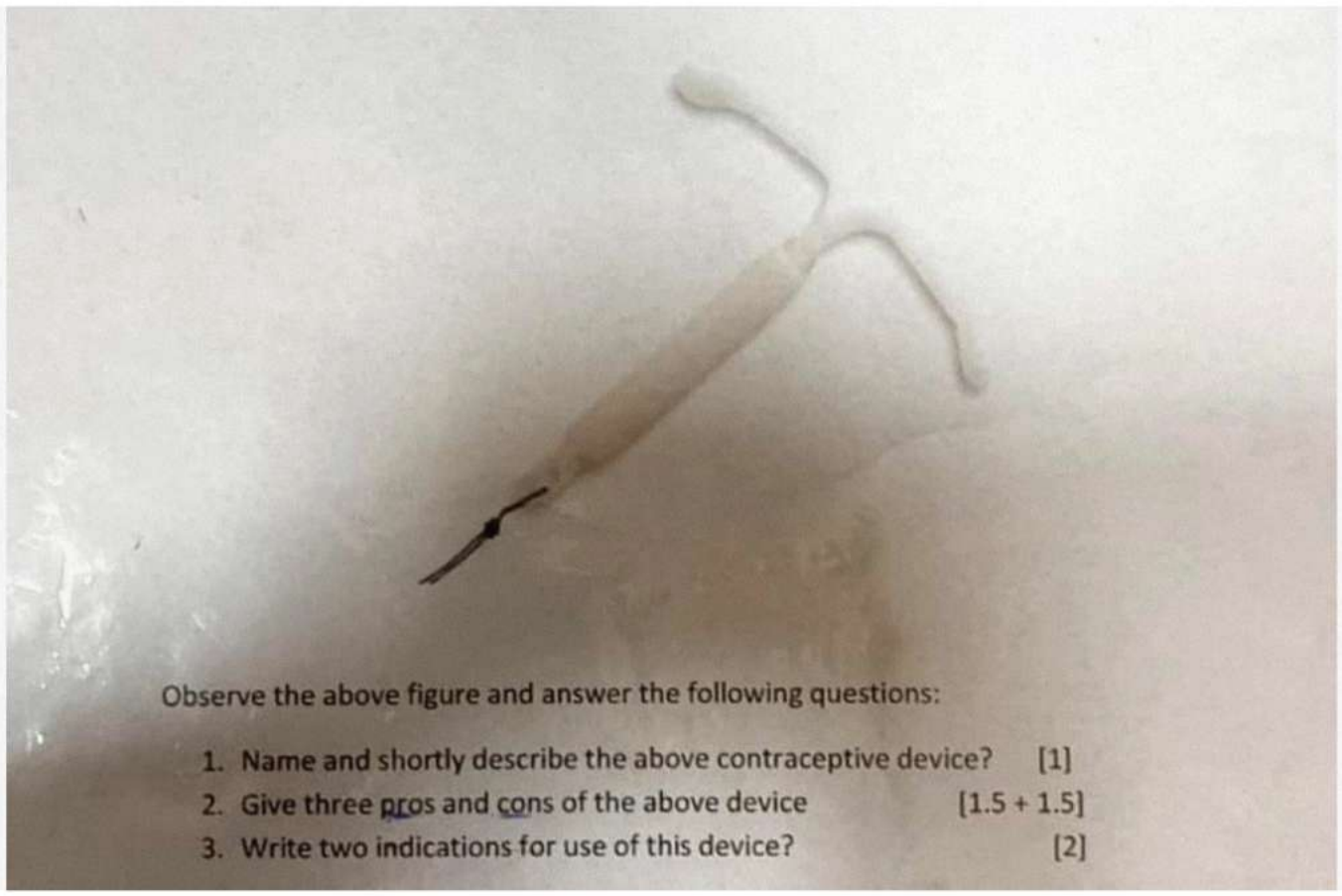
B. Write advantages and disadvantages of slow sand filter? (2 marks)

Disadvantages
- occupy large area
- Rate of filtration is low

Advantages

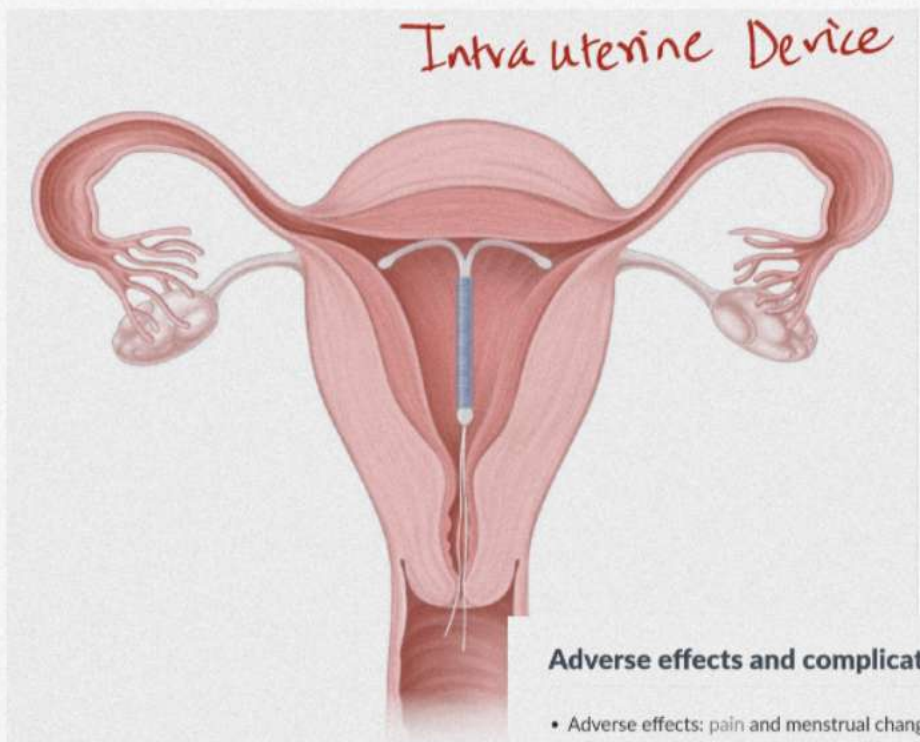
- **Simple & Cheap** to construct
- Physical, chemical & biological quality of filtered water is very high
- ***Removes total bacteria count by 99.9%***





Observe the above figure and answer the following questions:

1. Name and shortly describe the above contraceptive device? [1]
2. Give three pros and cons of the above device [1.5 + 1.5]
3. Write two indications for use of this device? [2]



Adverse effects and complications of IUDs [6]

- Adverse effects: pain and menstrual changes (typically resolve within 3–6 months) [6][8]
  - All IUDs: temporary cramping and discomfort
  - Hormonal IUD: abnormal uterine bleeding (e.g., spotting, irregular menses), amenorrhea
  - Copper IUD: heavy menstrual bleeding, dysmenorrhea
- Complications [5][32]
  - Expulsion [5]
  - Uterine perforation [5]
  - If pregnancy occurs, there is an elevated risk of it being ectopic, but the absolute risk of an ectopic pregnancy is extremely low. [5][6]

Long-acting reversible contraceptives (LARC) [5][6][7]	• IUD (copper or hormonal) • Progestin implant	• Long-lasting (3–12 years) [6][7][8] • Highly effective; the progestin implant is the most effective form of contraception [2]	• IUDs can be used as emergency contraception • Requires placement by a trained provider

IUD

Advantages

The IUD has many advantages : (a) simplicity, i.e., no complex procedures are involved in insertion; no hospitalization is required (b) insertion takes only a few minutes (c) once inserted IUD stays in place as long as required (d) inexpensive (e) contraceptive effect is reversible by removal of IUD (f) virtually free of systemic metabolic side-effects associated with hormonal pills (g) highest continuation rate, and (h) there is no need for the continual motivation required to take a pill daily or to use a barrier method consistently; only a single act of motivation is required. However, as with most contraceptive methods, the IUD can produce side-effects such as heavy menstruation and/or pain.

Contraindications

ABSOLUTE : (a) suspected pregnancy (b) pelvic inflammatory disease (c) vaginal bleeding of undiagnosed aetiology (d) cancer of the cervix, uterus or adnexia and other pelvic tumours (e) previous ectopic pregnancy *(50)*.

RELATIVE : (a) anaemia (b) menorrhagia (c) history of PID since last pregnancy (d) purulent cervical discharge (e) distortions of the uterine cavity due to congenital malformations, fibroids (f) unmotivated person *(45)*.

Hormone Contraceptives

Contraindications

(a) *Absolute* : Cancer of the breast and genitals; liver disease; previous or present history of thromboembolism; cardiac abnormalities; congenital hyperlipidaemia; undiagnosed abnormal uterine bleeding.

(b) *Special problems requiring medical surveillance* : Age over 40 years; smoking and age over 35 years; mild hypertension; chronic renal disease; epilepsy; migraine; nursing mothers in the first 6 months; diabetes mellitus; gall bladder disease; history of infrequent bleeding, amenorrhoea, etc. *(63)*.

Progestin Injectables

Contraindications

These include cancer of the breast; all genital cancers; undiagnosed abnormal uterine bleeding; and a suspected malignancy. Women usually should not start using a progestin-only injectable if they have high blood pressure (systolic ≥ 160 mm Hg or diastolic ≥ 100), certain conditions of the heart, blood vessels, or liver including history of stroke or heart attack and current deep vein thrombosis. Also, a woman breast-feeding a baby less than 6 weeks old should not use progestin-only injectables *(82)*.

The particular advantage of DMPA and NET–EN is that they are highly effective, long-lasting and reversible contraceptives. Check-lists have been developed for auxiliaries primarily for the screening of women who can be given injectable contraceptives without being examined by the physician; they can also be utilized in follow-up visits.

MACROMINERAL	FUNCTIONS	DEFICIENCY
Sodium	-Principal extracellular cation -buffer constituent -water and acid base balance -cell membrane permeability -uptake of glucose, galactose and amino acids	-dehydration -acidosis -excess leads to edema and hypertension
Potassium	-principal intracellular cation -buffer constituent -water and acid base balance -neuromuscular irritability	- muscle weakness - paralysis and mental confusion - acidosis
Chloride	-principal extracellular anion -electrolyte -osmotic balance -acid base balance -gastric HCl formation	- deficiency secondary to vomiting and diarrhea
Calcium	-constituent of bone and teeth -blood clotting -regulation of nerve, muscle and hormone function	- tetany - muscle cramps - convulsions -osteoporosis and rickets
Phosphorus	-constituent of bone and teeth, nucleic acids, NAD, FAD, ATP etc. -required for energy metabolism	- growth retardation - skeletal deformities - muscle weakness - cardiac arrhythmia
Magnesium	-cofactor for phosphate transferring enzymes -constituent of bones and teeth -muscle contraction -nerve transmission	- muscle spasms - tetany - confusions - seizures
Sulfur	-constituent of proteins, bile acid, GAG, vitamins like thiamine, lipoic acid -involved in detoxication reactions	Unknown

MICROELEMENT	FUNCTION	DEFICIENCY
Chromium	Potentiate the effect of insulin	Impaired glucose metabolism
Cobalt	Constituent of Vitamin B_{12}	Macrocytic anemia
Copper	-constituent of oxidase enzymes e.g. tyrosinase, cytochrome oxidase, ferroxidase, ceruloplasmin - iron absorption and mobilization	-microcytic hypochromic anemia -depigmentation of skin, hair - excessive deposition in liver in **Wilson's disease**
Fluoride	-constituent of bone and teeth -strengthens bone and teeth	Dental caries
Iodine	-constituent of thyroid hormones (T_3 and T_4)	- **Cretinism** in children - **goiter** in adults
Iron	-constituent of heme and non-heme compounds -transport and storage of O_2	Microcytic anemia
Manganese	Cofactor for number of enzymes e.g. arginase, carboxylase, kinase etc.	Not well defined
Molybdenum	Constituent of xanthine oxidase, sulfite oxidase and aldehyde oxidase	**Xanthinuria** (excess urinary excretion of xanthine)
Selenium	-antioxidant -cofactor for glutathione peroxidase -protects cell against membrane lipid peroxidation -found as selenocysteine in selenoproteins	Cardiomyopathy
Zinc	-cofactor for enzymes in DNA, RNA and protein synthesis -constituent of insulin, carbonic anhydrase, carboxypeptidase, LDH, alcohol dehydrogenase, alkaline phosphatase	- growth failure - impaired wound healing - defects in taste and smell - loss of appetite

VITAMIN	ACTIVE FORM	SOURCES	FUNCTIONS
Vitamin B_1 (Thiamine)	Thyamine pyrophosphate (TPP)	Cereals, meat, nuts, green vegetables, eggs	-carbohydrate metabolism -normal functioning of nervous system
Vitamin B_2 (Riboflavin)	Flavin mononucleotide (FMN) and Flavin adenine dinucleotide (FAD)	Yeast, germinating seeds, green leafy vegetables, milk, eggs, liver, meat	Work with other B vitamins to promote healthy growth and tissue repair, and helps release energy from carbohydrates -electron transfer
Vitamin B_3 (Niacin)	NAD^+ and $NADP^+$	Yeast, legumes, liver, meat	-work with other B vitamins to help release energy from carbohydrates - plays a role in DNA repair -electron transfer
Vitamin B_5 (Pentothenic Acid)	Coenzyme A and Acyl carrier protein (ACP)	Wheat germs, cereals, yeast, liver, eggs	-synthesis of cholesterol -energy production -fatty acid synthesis -acyl carrier
Vitamin B_6 (Pyridoxine)	Pyridoxal phosphate (PLP)	Yeast, unrefined cereals, pulses, vegetables, meat, fish, egg yolk	-maintain healthy brain function -formation of RBCs -breakdown of proteins -synthesis of antibodies
Vitamin B_7 (Biotin)	Biocytin (enzyme bound biotin)	Liver, kidney, egg yolk, vegetables	-coenzyme of carboxylase reactions
Vitamin B_9 (Folic Acid)	Tetrahydrofolic acid	Green leafy vegetables, liver, yeast	-transfer one-carbon units -synthesis of methionine, serine, purine nucleotides, and thymidine monophosphate - work with B_{12} and Vitamin C to help the body digest and utilize proteins
Vitamin B_{12} (Cobalamin)	Methylcobalamin, Deoxyadenosyl-cobalamin	Only animal origin, meat, egg, liver, fish	-coenzyme for reactions: Hemocysteine → methionine Methylmalonyl CoA → succinyl CoA - formation of RBCs - maintenance of CNS
Vitamin C (Ascorbic Acid)	Ascorbic acid	Citrus fruits, amla, leafy vegetables, tomatoes	-collagen biosynthesis - bone and dentin formation - wound healing - acts as antioxidant
			- prevents atherosclerosis and coronary heart disease by preventing oxidation of LDL - converts folic acid to its active form - absorption of iron from intestine
Vitamin A (Retinol)	Retinoids i.e. Retinol, Retinal, Retinoic acid	-Fish liver oil - animal liver - milk and dairy products -dark green leaves e.g. spinach - yellow and red fruits and vegetables e.g. carrots, tomatoes, peaches	- vision - cell differentiation and growth - mucus secretion - maintenance of epithelial cells - β-carotenes have antioxidant function -maintenance of reproduction
Vitamin D (Cholecalciferol)	1,25dihydroxy Cholecalciferol (calcitriol)	Cod liver oil, sunlight induced synthesis of vitamin D_3 in skin, egg yolk	-regulation of calcium and phosphorus metabolism -calcification of bone
Vitamin E (Tocopherol)	α-tocopherol	Soya and corn oils, germ oil, fish oil, eggs, alfalfa	- natural antioxidant -protects cell membrane and tissues from damage by oxidation -required for normal reproduction and prevents sterility
Vitamin K	Phylloquinone (Vitamin K_1), Menaquinones (Vitamin K_2)	Green leafy vegetables, tomatoes, cheese, meat, egg yolk	-important role in blood coagulation - required for activation of clotting factors prothrombin II, factor VII, IX and X - γ-carboxylation of glutamate residues in clotting

VITAMIN	DAILY REQUIRE-MENTS	DEFICIENCY	TOXICITY
Vitamin B1 (Thiamine)	1.0 – 1.5 mg	Beriberi (four types) 1.Dry beriberi (peripheral neuritis) 2.Wet beriberi (cardiac manifestation) 3.Cerebral beriberi (Wernickle Korsakoff syndrome) 4.Infantile beriberi	No established toxic level (Toxicity with water-soluble vitamins are not common as any excess amount will leave through the urine)
Vitamin B2 (Riboflavin)	1.3 – 1.7 mg	Cheilosis (fissures at angle of mouth), Glossitis (inflammation of mouth), dermatitis, vascularization of cornea	None
Vitamin B3 (Niacin)	15 – 20 mg	Pellagra characterized by 4 D's Dermatitis, Diarrhea, Dementia, Death	-Vasodilation and flushing - Liver damage
Vitamin B5 (Pentothenic Acid)	5 – 10 mg	Burning feet syndrome	None
Vitamin B6 (Pyridoxine)	1.6 – 2 mg	Neurological disorders (depression, nervousness, irritability), Epileptic convulsions, dermatitis, hypochromic microcytic anemia	Pyridoxine seems to be safe at levels 100 to 150 mg/day. Women, self medicating for PMS taking 500 to 5000 mg/day have shown peripheral neuropathy within 1 to 3 years
Vitamin B7 (Biotin)	150 – 300 µg	Deficiency is uncommon as biotin is synthesized by intestinal microorganisms in large quantities Experimentally induced symptoms are nausea, anorexia, glossitis, dermatitis, alopecia (loss of hair), depression, muscle pain	None
Vitamin B9 (Folic Acid)	200 µg	Megaloblastic or macrocytic anemia, neural tube defects, promotes birth defect spina bifida	None
Vitamin B12 (Cobalamin)	3 µg	Pernicious anemia (intrinsic factor deficiency), megaloblastic anemia (functional folate deficiency), neuropathy (dementia), Methylmalonic aciduria	None
Vitamin C (Ascorbic Acid)	60 – 70 mg	Scurvy (bleeding tendency, muscle weakness, swollen bleeding gums, loosening of teeth, osteoporosis, poor wound healing)	Severe diarrhea and deficiency of oxalate stones in kidneys

Vitamin A	800 – 1000 retinol equivalents	Night blindness, xerophthalmia, formation of Bitot's spots, dry, rough and scaly skin, retardation of growth in children, infertility	Nausea, vomiting, alopecia (loss of hair), scaly and rough skin, bone and joint pain, teratogenic effect on fetus
Vitamin D (Cholecalciferol)	200 – 400 IU	Rickets (in children), Osteomalacia (in adults)	Nausea, vomiting, anorexia, increased thirst, loss of weight, hypercalcemia, formation of kidney stones
Vitamin E (Tocopherol)	8 – 10 mg	Hemolytic anemia, Retrolental fibroplasia in premature infants	None
Vitamin K	70 – 140 µg	Hemorrhagic disorder, Increased clotting time	-hemolytic anemia and kernicterus in infants with low birth weight

Ospe # 3

1. The above picture shows a condition, caused by Iron Deficiency. Name the condition. (1)

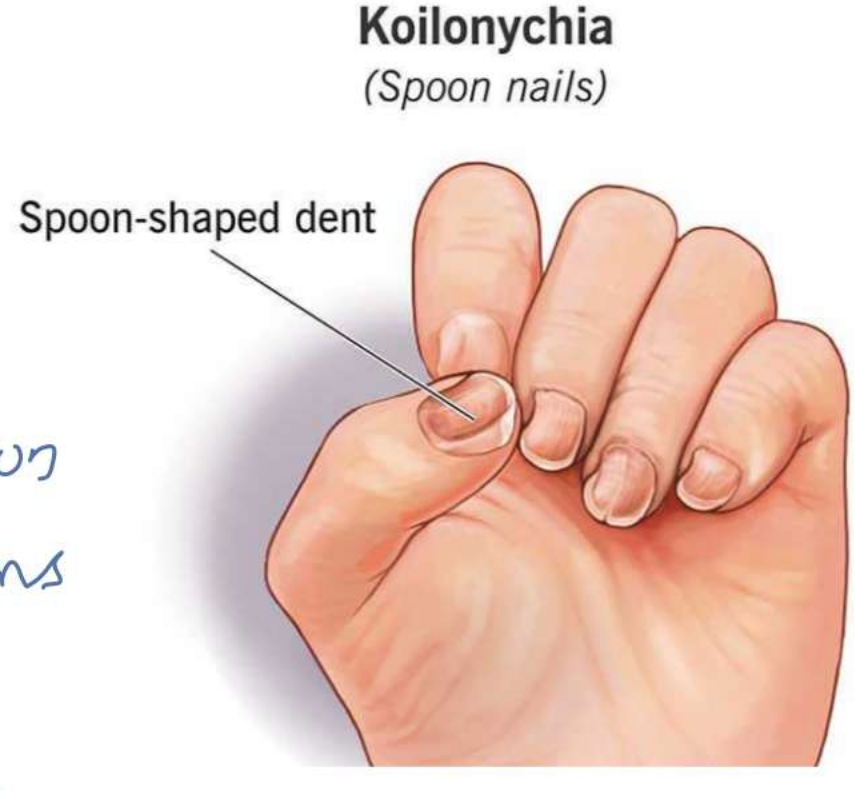
2. Enlist at least four sources of Iron? (2)

3. Enlist at least six symptoms/Diseases caused by Iron deficiency? (3)

1- Koilonychia

2- Red meat, Legumes, Nuts and Seeds, Cereals, Leafy greens

3- Anemia
Restless leg Syndrome
Fatigue and weakness
Hair loss
Poor cognitive function
↑ risk of infections
Pale skin
Headaches
Cold hand and feet



OSPE # 8

Observe the above figure and answer the following questions:

1. Write down on your answer sheet, the type of waste to be collected in ea of the color coded bins? [2]
2. What is percentage amount of hazardous and non-hazardous waste collected in hospitals? (2)
3. Write two diseases transmitted by pricks/cuts due to sharps? (2)

Red → Sharps
Yellow → infectious Waste
Blue → Liquid Waste
Black → General Waste

Hazardous % → 10 - 15 %
Non - Hazardous % → 75 - 90 %

Diseases transmitted by pricks

- Hepatit B
- AIDS (HIV)

OSPE # 9

An EPI technician is vaccinating a mother of child bearing age according to Pakistan's EPI vaccination schedule.

Instructions: A table is provided with missing information in **YELLOW COLORED CELLS.** These cells are labeled with capital alphabets **(A, B, C, D, E, & F).** Write on your answer sheet, the missing information with the respective alphabetical label. (Total marks: 6; each cell having 1 mark)

Table: Pakistan's EPI vaccination schedule 2022 for Women of Childbearing Age

Dose	When to give	Expected duration of protection
TT 1	At first contact or as early as possible in pregnancy	None
TT 2	A	B
TT 3	C	D
TT 4	E	F
TT 5	At least one year after TT 4 or during subsequent pregnancy	All childbearing years

Dose	When to give	Expected duration of protection
TT 1	at first contact or as early as possible in pregnancy	none
TT 2	at least 4 weeks after TT 1	1 - 3 years
TT 3	at least 6 months after TT 2	5 years
TT 4	at least one year after TT 3 or during subsequent pregnancy	10 years
TT 5	at least one year after TT 4 or during subsequent pregnancy	All childbearing years

OSPE # 4

Instructions: Look at the following figure and answer the given questions.

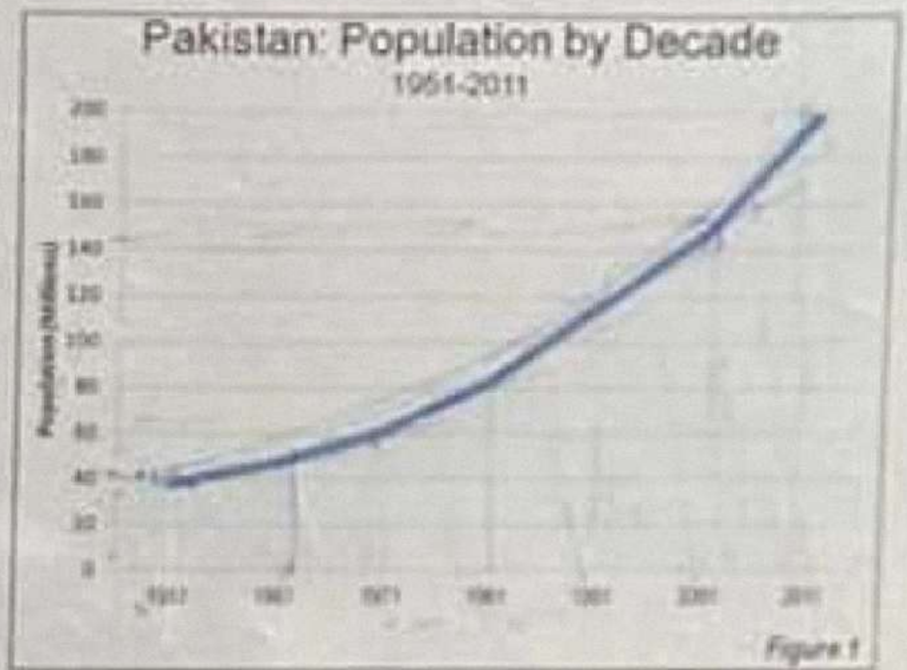


Figure: Population of Pakistan by decade

Reference: [illegible]

Questions:

1. Describe the variables at X & Y axis? 02
2. Interpret the graph, what information is it displaying? 04

① Describe the variables at X & Y axis:

X-axis (horizontal): Represents the years (decades) from 1951 to 2011.
Y-axis (vertical): Represents the population of Pakistan in millions.

② Interpret the graph, what information is it displaying?

The graph shows the population growth of Pakistan over different decades from 1951 to 2011. The trend is an upward curve, indicating that the population has increased significantly over time. The rate of increase appears to be accelerating, suggesting a rapid population growth in recent decades.

Demography: Statistical Study of human population

★ Elements Describing population health

- Population pyramid → Age and sex distribution

★ Measures of Disease Frequency

- Incidence and prevalence
  - Incidence → No. of new cases
  - Prevalence → No. of current cases

Formula:

$$\frac{\text{Total No. of cases}}{\text{Total population during a specific time}}$$

Mortality

the number of deaths in a population within a specific time interval

Morbidity

the number of individuals in a population with a disease at a specific point in time or specific time interval (i.e., disease frequency)

Thyroid function of goiter

- **Nontoxic goiter**: normal TSH, fT_3, and fT_4 levels
  - E.g., Iodine deficiency
- **Toxic goiter**: increased thyroid hormone production
  - E.g., Graves disease, toxic multinodular goiter
- **Hypothyroid goiter**: decreased thyroid hormone production
  - E.g., Hashimoto's disease, congenital hypothyroid goiter

Prevention of Diabetes mellitis

Lifestyle modifications [40]

Lifestyle recommendations for patients with diabetes mellitus [40]	
Physical activity	• Exercise regularly. ◦ 2 ½ hours of aerobic exercise spread over ≥ 3 days per week ◦ 2–3 sessions of resistance exercise per week • Reduce the amount of time spent sedentary. and an increase in nonsedentary activities.
Balanced diet and nutrition	• Refer to a registered nutritionist. • Individualize dietary recommendations taking into account the patient's health status, preferences, and cultural background. • General recommendations include: ◦ A high-fiber diet ◦ Eating nonstarchy vegetables, whole foods ◦ Avoiding refined sugar and grains
Weight management [41]	• Assess BMI annually. • T2DM and overweight: Aim for ≥ 5% weight loss. [41] ◦ Recommend dietary changes and physical activity. ◦ Consider weight loss drugs or bariatric surgery depending on BMI. ◦ Consider weight maintenance programs if weight loss is achieved. • See "Metabolic syndrome" for details on weight loss treatment options.
Other	• Recommend smoking cessation for all patients; offer counseling if necessary. [42] • Alcohol consumption [42][43] ◦ Should be limited to a moderate intake ◦ To avoid hypoglycemia, consume alcohol together with food and monitor glucose after consumption.

Micronutrients

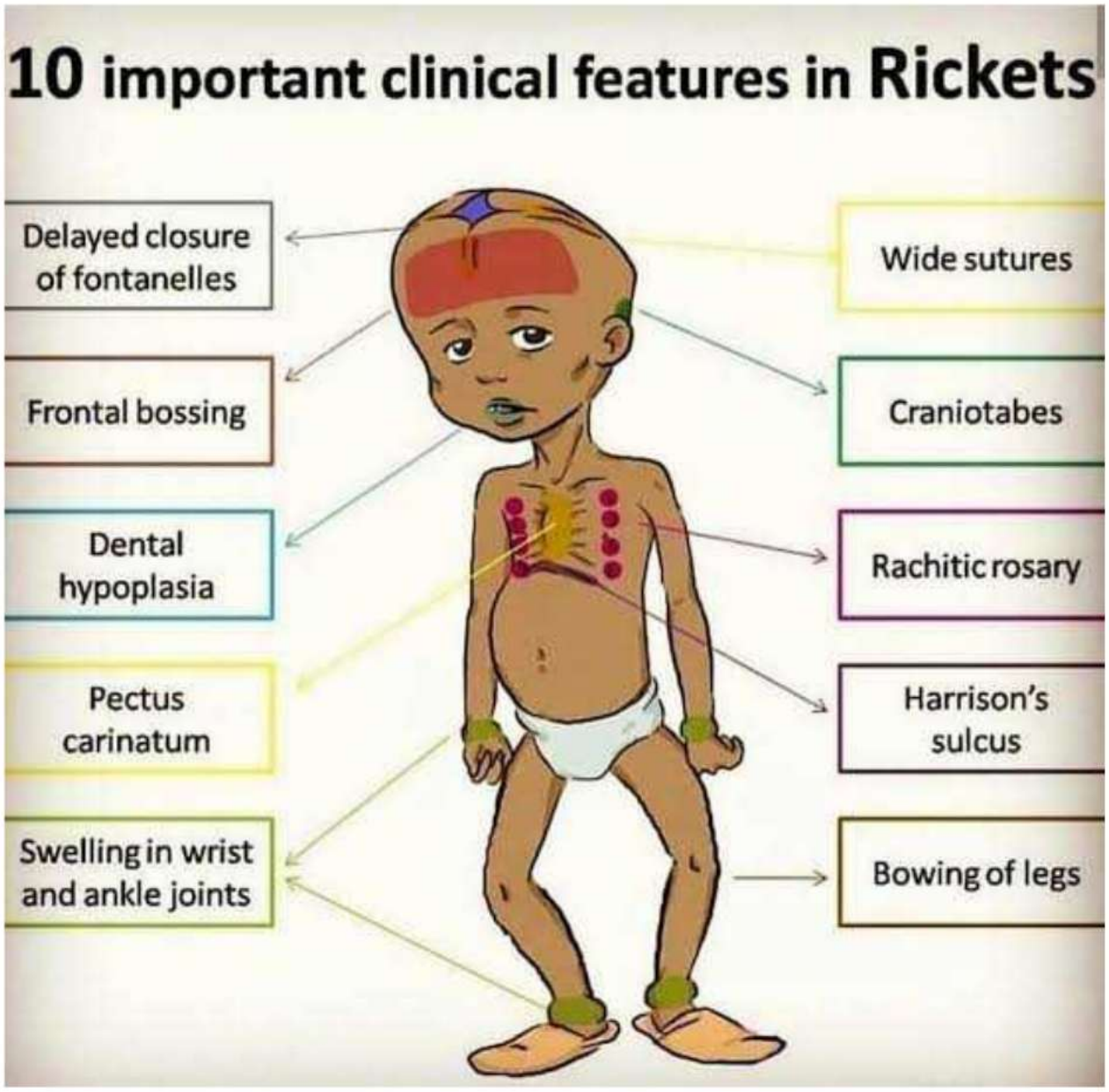
- **Definition**: nutrients that the body requires in small amounts to ensure proper function, esp. vitamins and minerals

Vitamins

- **Definition**: a diverse class of organic compounds essential to nutrition in minute quantities
- **Vitamin-rich foods**: vegetables, fruit, whole grains, legumes, animal products (especially vitamin B_{12}, vitamin A)
- **Function**: coenzymes, antioxidants, play a role in hormone function
- **Types**
  - Fat-soluble vitamins
    - Vitamin A (retinol)
    - Vitamin D (calciferol)
    - Vitamin E (tocopherol)
    - Vitamin K (phytomenadione)
  - Water-soluble vitamins
    - Vitamin B_1 (thiamine)
    - Vitamin B_2 (riboflavin)
    - Vitamin B_3 (niacin)
    - Vitamin B_5 (pantothenic acid)
    - Vitamin B_6 (pyridoxine)
    - Vitamin B_7 (biotin)
    - Vitamin B_9 (folate)
    - Vitamin B_{12} (cobalamin)
    - Vitamin C (ascorbic acid)

minerals

- **Types**
  - Macrominerals [5]
    - Calcium
    - Magnesium
    - Phosphorus
    - Sodium
    - Potassium
    - Chloride
  - Trace elements [5]
    - Iron
    - Copper
    - Zinc
    - Iodine
    - Selenium
    - Sulfur
    - Fluoride



Vit D/
Calcium
Deficiency

XEROPHTHALMIA

- *spectrum of ocular disease caused by lack of vitamin-A*

Etiology :-

- *dietary deficiency of vitamin-A*
- *defective absorption from the gut*

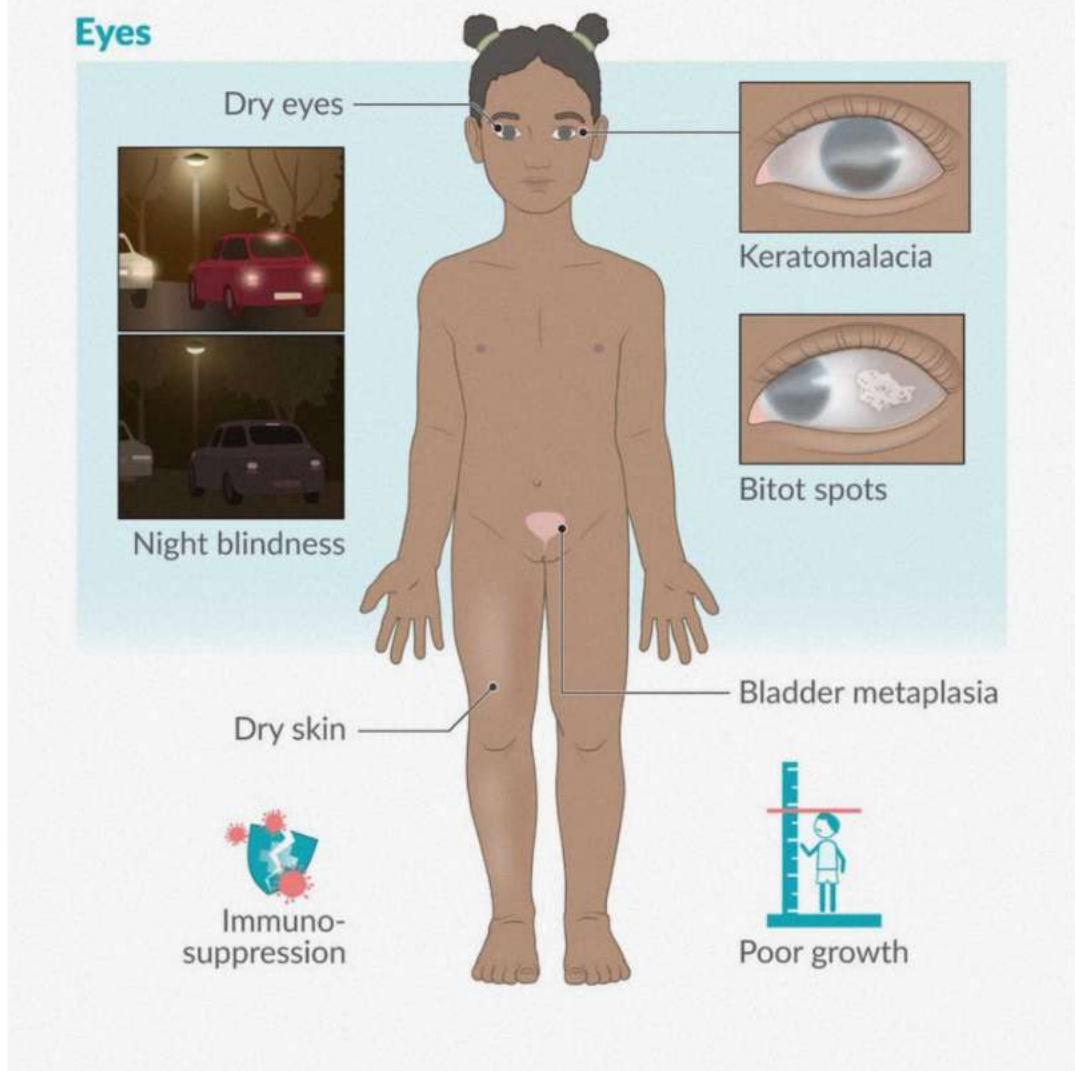
Clinical features :-

- *Night blindness*
- *Conjunctival xerosis*
- *Bitot's spots*
- *Corneal xerosis*
- *Corneal ulceration/keratomalacia*
- *Corneal scar*
- *Xerophthalmic fundus.*

Treatment :-

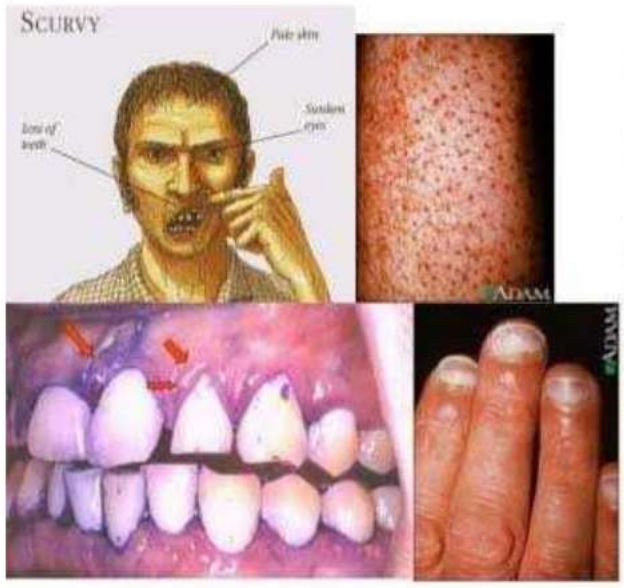
1. *Local ocular therapy*
   0.7% hydroxypropyl methyl cellulose or 0.3%hypromellose
2. *Vitamin A therapy*

Vitamin A Deficiency

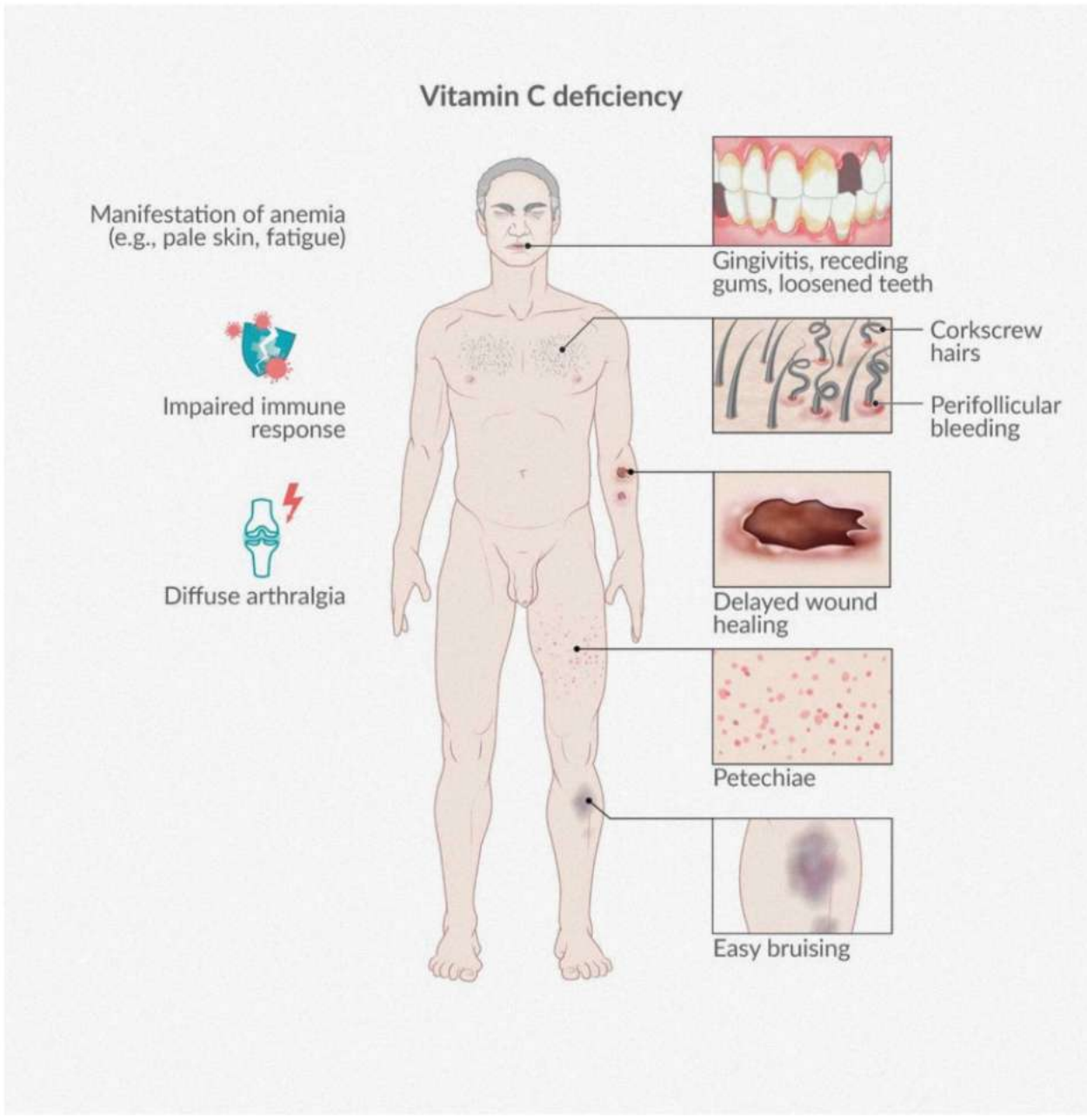


Vitamin C Deficiency

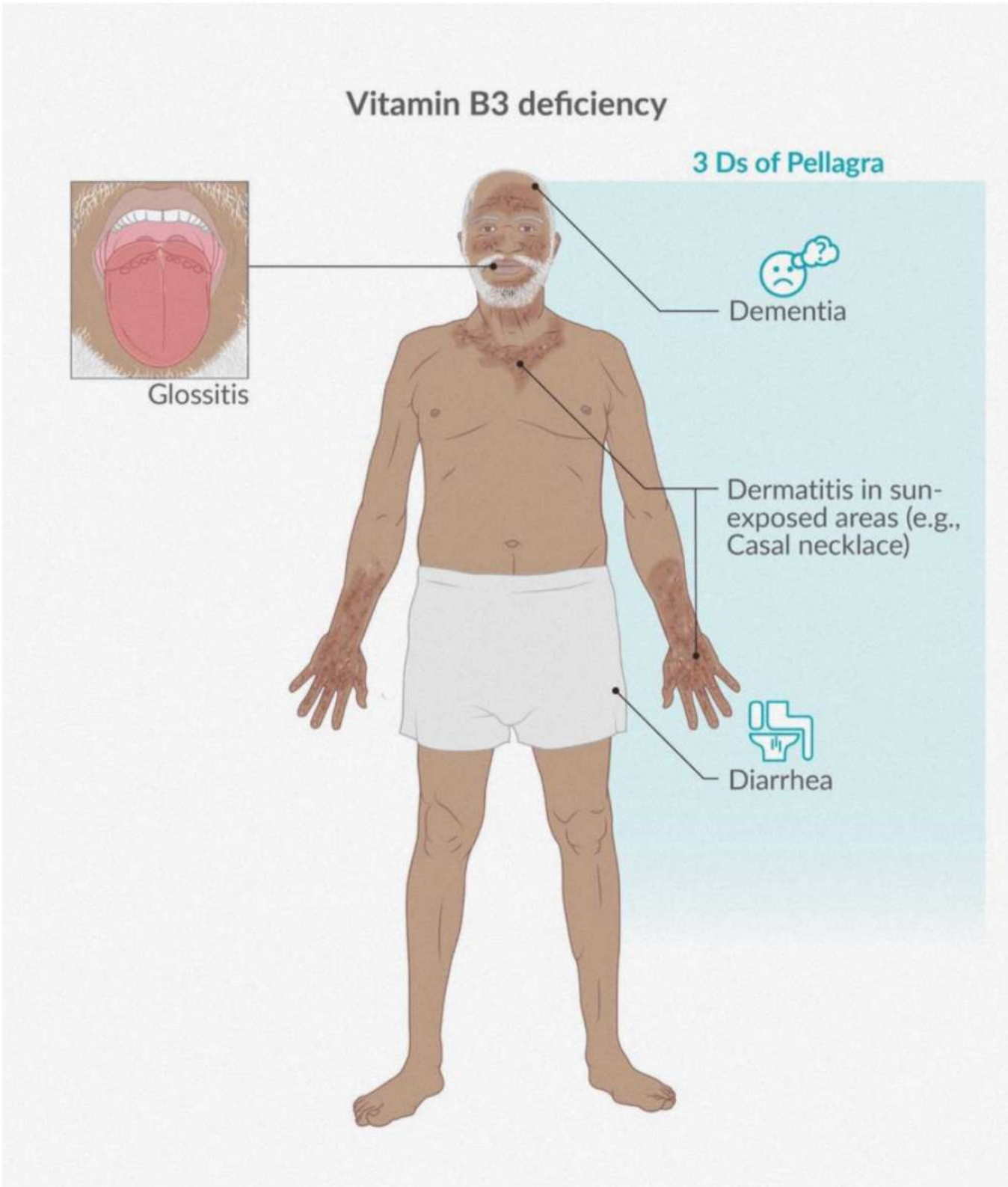
Symptoms of Scurvy



- There are many symptoms of Scurvy
- Swelling and bleeding of the gums (Gingival Hemorrhage)
- Often sick
- Easily bruised and bleeding
- Poor wound healing
- Pain and swelling of the joints
- Hair and tooth loss
- Small bleeding around the hair follicles (Corkscrew Hair)
- Small bleeding under nails (Periungual Hemorrhage)
- Fatigue
- Dry, pale skin



Niacin Deficiency → 4 Ds
Diarrhea, Dermatitis, Dementia, Death



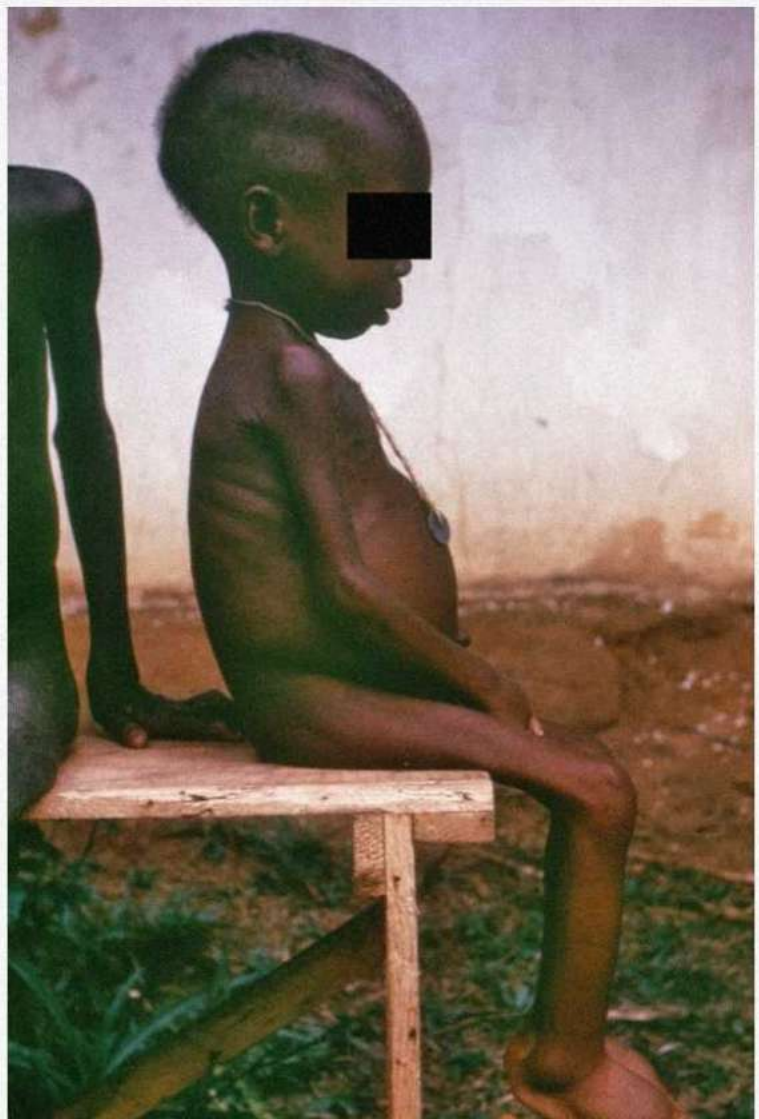
Kwashiorkor is characterized by muscle atrophy, pitting edema, and distended abdomen with an enlarged fatty liver. It is caused by a deficiency of dietary protein despite sufficient calorie intake (e.g., from carbohydrates).

Features

- **Bilateral pitting edema**, anasarca in severe cases
- **Distended abdomen** (due to hepatomegaly, intestinal distention, and weakened abdominal muscles)
- **Hepatomegaly**
- Skin changes: thin, dry, peeling skin with areas of hyperpigmentation and hyperkeratosis (flaky skin)
- Hair changes: dry, hypopigmented hair that falls out easily
- Rounded cheeks (moon face)
- Muscle atrophy
- Variable weight for height
- Apathetic affect

Deficiency

- **Primarily protein,** e.g., due to:
  - Premature cessation of breastfeeding
  - Chronic GI infection
  - Protein-deficient diet: inadequate intake of staple foods without the necessary amounts of proteins (e.g., sweet potatoes, cassava)



Marasmus is the diffuse loss of muscle and fat tissue (without edema or distended abdomen) due to a severe state of total calorie deficiency of all macronutrients.

- **Profound** muscle wasting (broomstick extremities)
- **Loss of** subcutaneous fat
- Pronounced chest bone, ribs, and facial bones
- Failure to thrive: Low weight for height
- Thin, dry skin
- Thin, sparse hair
- Irritable affect
- **No** edema

Balanced Diet
Food pyramid

60 - 75 % Carbohydrates

15 - 30 % Fats

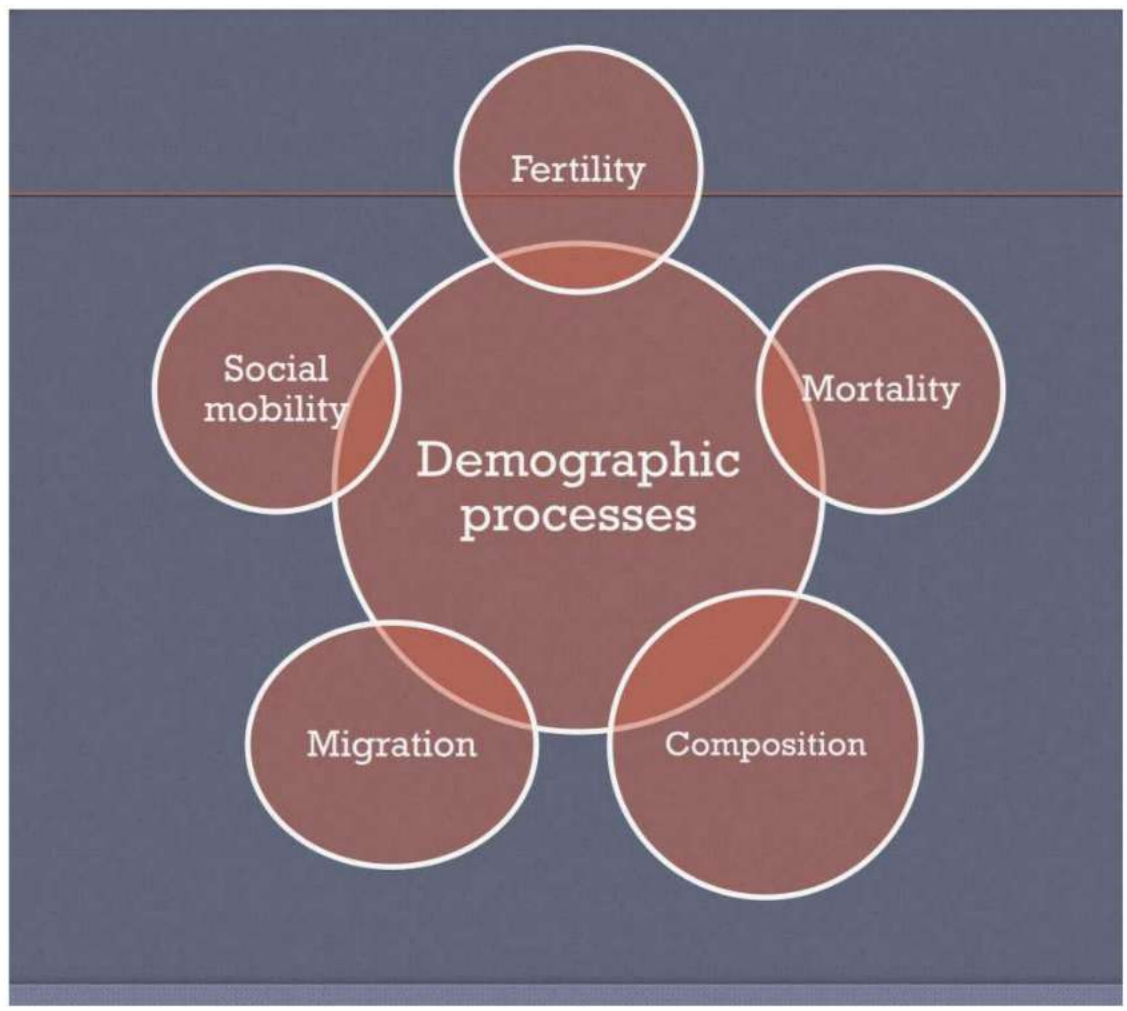
10 - 15 % Proteins

Inhibitors of fertility are

1. **Delayed marriages**
2. **The use of contraception**
3. **Induced abortions**
4. **Post-partum in-fecundability (induced by breast feeding or abstinence)**

Definition of Demography

The study of the characteristics of human populations, such as size, growth, density, distribution, and vital statistics.



Census is defined as

- "The total process of collecting, compiling and publishing demographic, economic and social data pertaining at a specified time or times to all persons in a country or delimited territory"

Dependency Ratio

Dependency ratio is an index summarizing an age distribution.
Strictly, this is the ratio of population who are economically not active. However, due to the difficulties in defining economic activity in many countries especially when international comparisons are to be made, a ratio of age group is used instead, such as:

$$\text{Dependency Ratio} = \frac{\text{Pop. of children} \downarrow 15 + \text{Elderly 65 \&} \uparrow}{\text{working age population 15-64 yr}} \times 100$$

Sex Ratio

The overall sex ratio is simply the ratio of males to females in the population and is calculated by taking the number of males in a population and dividing it by the number of females in the same population. It is usually expressed as the number of males per 100 females:

$$\text{Sex Ratio} = \frac{\text{number of males}}{\text{number of females}} \times 100$$

Mortality

- **Definition**: the number of deaths in a population within a specific time interval

Overview of other measures of mortality

Measure	Description	Formula [5]
Mortality rate (crude death rate)	• Frequency of deaths in a population within a specific time interval	• MR = (number of deaths during a specific time period)/(population size) × 100 • Typically measured for one year and expressed as the number of deaths per 1000 individuals/year or 100,000 individuals/year
Case fatality rate (lethality)	• Percentage of cases (patients with a specific condition) that result in death within a specific time interval	• CFR = (number of deaths from a specific condition)/(number of cases with the same specific condition) × 100
Proportionate mortality rate	• Percentage of deaths due to a specific condition within a specific time interval	• PMR = (number of deaths from a specific cause in a specific time period)/(total deaths from all causes in that time period) × 100 or 1000
Fetal mortality rate	• Rate of fetal deaths within a specific time interval	• FMR = (number of fetal deaths of ≥ 20 weeks of gestation)/(total number of live births + fetal deaths) × 1,000
Neonatal mortality rate	• Rate of neonatal deaths within a specific time interval	• NMR = (number of infant deaths during the first 28 days of life)/(total number of live births) × 1,000 ◦ Late neonatal mortality rate = (number of infant deaths during postnatal days 7–28)/(total number of live births) × 1,000 ◦ Early neonatal mortality rate = (number of infant deaths during the first week after birth)/(total number of live births) × 1,000
Postneonatal mortality rate	• Rate of postneonatal deaths within a specific time interval (from 28 to 364 days of age)	• PNMR = (number of infant deaths between 28 and 364 days of age)/(total number of live births) × 1,000
Infant mortality rate	• Rate of total infant deaths within a specific time interval (from birth to 1 year of age) [5]	• IMR = (number of infant deaths during the first year after birth)/(total number of live births) × 1,000

Perinatal mortality rate	• The rate of fetal deaths (stillbirths) and early neonatal deaths within a specific time interval [6]	• PMR = (number of fetal + neonatal deaths)/(total number of live births + fetal deaths) × 1,000
Under-five mortality rate	• Rate of death of children younger than 5 years within a specific time interval [7]	• U5MR = (number of deaths of children younger than 5 years)/(total number of live births) x 1,000
Maternal mortality rate	• The rate of maternal deaths attributed to pregnancy within a specific time interval.	• MMR = (maternal deaths)/(live childbirths) × 100,000
Standardized mortality ratio	• The ratio of deaths observed in a specific population to deaths expected in the general population	• SMR = (number of deaths observed in population)/(number of deaths expected in population)
Years of potential life lost	• A measure of premature mortality; estimates the number of years a person in a given population would have lived if they hadn't died prematurely	• Individual YPLL = (standard year) - (age at individual's death) • Population YPLL = sum of individual YPLL across the population

CONTRAINDICATION TO BREASTFEEDING

- Active /untreated TB
- Mom takes radioactive compound(cancer for chemo)
- Mom take illegal drug
- HIV infection

Occupational diseases

I. Disease due to physical agents	
Heat	Heat hyperpyrexia, heat exhaustion, heat syncope, heat cramps, burns & prickly heat
Cold	Trench foot, frost bite, chilblains
Light	Occupational cataract, miner's nystagmus
Pressure	Caisson disease, air embolism, blast
Noise	Occupational deafness
Radiation	Cancer, leukemia, aplastic anemia, pancytopenia

I. Disease due to physical agents	
Mechanical factors	Injuries & accidents
Electricity	Burns
II. Diseases due to chemical agents	
1. Gases	CO_2, CO, HCN, CS_2, NH_3, N_2, H_2S, HCL, SO_2

II. Diseases due to chemical agents			
2.	Dusts (Pneumoconiosis)		
	a)	Inorganic dusts	
		I Coal dust	Anthracosis
		II Silica	Silicosis
		III Asbestosis	Asbestosis, cancer lung
		IV Iron	Siderosis

II. Diseases due to chemical agents			
2.	Dusts (Pneumoconiosis)		
	b)	Organic (vegetable dusts)	
		I Cane fiber	Bagassosis
		II Cotton dust	Byssinosis
		III Tobacco	Tobacossis
		IV Hay or grain dust	Farmers' lung

Occupational diseases

II. Diseases due to chemical agents	
3. Metal & components	Toxic hazards from Lead, mercury, Cd, Mg, Be arsenic, chromium
4. Chemicals	Acids, Alkalis, pesticides, etc
5. Solvents	Carbon bisulphide, benzene, chloroform, trichloroethylene, etc

III. Disease due to biological agents
Brucellosis, leptospirosis, anthrax, actinomycosis, hydatidosis, psittacosis, tetanus, encephalitis, fungal infections

IV. Occupational cancers
Cancer of skin, lungs & bladder

V. Occupational dermatosis
Dermatitis , eczema

VI. Disease of psychological origin
Industrial neurosis, hypertension, peptic ulcer

Types of pneumoconiosis

1. Silicosis → Silica
2. Anthracosis → Coal Dust
3. Byssinosis → Cotton Dust
4. Bagassosis → Cane Fiber
5. Asbestosis → Asbestos
6. Farmer's lung → Hay or grain dust

Silicosis: signs / symptoms & investigation

- Insidious onset, Irritant cough, dyspnea on exertion and chest pain.
- Impairment of total lung capacity (TLC)
- Mild restrictive ventilatory defect and decreased lung compliance.
- X-ray shows "snow-storm" appearance in lung field.
- Typical & atypical mycobacterial infections
- Tuberculin- positive persons with silicosis have 30 folds greater risk for developing TB (surveillance & treated)

Silicosis: management

- No effective treatment
- Continued exposure should be avoided – Dust control measures : substitution, complete enclosure, isolation, hydro blasting, good house-keeping, personal protective measures and regular physical examination of workers
- Frequent monitoring of dust level for safe working environment.
- Reduction of exposure to quartz above the threshold limit value would reduce the silicosis attack

Anthracosis

- Coal workers pneumoconiosis is the term used to describe parenchymal lung disease caused by the inhalation of coal dust.
- Miners who work at the coal face in underground mining and drilling in surface mines are at greater risk.

Anthracosis: symptoms, signs & investigation

- Cough with sputum production, often as a result of chronic bronchitis
- **PMF** invariably leads to respiratory insufficiency and death
- X-ray: shows small rounded opacities in the lung parenchyma(often upper lobe), complicated anthracosis / PMF is diagnosed when large opacities are present.
- Caplan's syndrome – rounded dense opacity.
- PFT- complicated disease will show restrictive or mixed pattern.

Anthracosis: Management

- Prevention primarily depends on effective control of exposure to coal mine dust(proper ventilation, use of water spray dust suppression and enclosure of mining operation).
- Removal of miners with early detection of CWP
- Coal worker pneumoconiosis has been declared a notifiable disease in the Indian Mine Act of 1952 and also compensable in the Workmen's compensation

Byssinosis

- Byssinosis is due to inhalation of cotton fiber dust over long period of time.
- Chronic cough, progressive dyspnoea and end up in chronic bronchitis and emphysema.
- India has a textile industry employing nearly 30% of factory workers.
- Incidence is 7-8%

Bagassosis

- It is caused by inhalation of bagasse/ sugar cane dust.
- The sugarcane fiber which until recently went to waste is now utilized in the manufacture of paper, cardbroad and rayon.
- It is due to thermophilic actinomycete (thermoactinomyces sacchari).
- It causes breathlessness, cough, haemoptysis and slight fever.

Bagassosis

- Skiagram may show mottling in lungs.
- PFT- impairment.
- If treated early, there is resolution of the acute inflammatory condition of the lung.
- If left untreated – diffuse fibrosis, emphysema and bronchiectasis.

Bagassosis: Preventive measures

- Dust control: wet process, enclosed apparatus and exhaust ventilation
- Personal protection: mask, respirators with mechanical filters or oxygen or air supply
- Medical control: initial medical examination and periodical medical check-ups
- Bagasse control: by keeping moisture content above 20% and spraying the bagasse with 2% propionic acid.

Asbestosis

- Asbestosis refers to the diffuse interstitial pulmonary fibrosis caused by inhalation of asbestos fiber(insoluble).
- It causes pulmonary fibrosis, leads to respiratory insufficiency and death; Ca of bronchus(smoking); mesothelioma of pleura or peritonium; and Ca of GIT.
- More than 5 to 10 years of exposure.
- Fibrosis is diffuse in character, and basal in location.

Asbestosis: signs, symptoms & investigation

- Progressive dyspnea and non productive cough
- Decreased breadth sounds
- Sputum shows "asbestos bodies" which are asbestos fibres
- In advanced stage – clubbing, cardiac distress and cyanosis seen
- X-ray – ground-glass appearance (small, regular/ linear opacity), B/L pleural thickening.

Asbestosis: Preventive measures

1. Use of safer type of asbestos. (chrysolite and amosite)
2. Substitution of other insulants: glass fiber, mineral wool, calcium silicate, plastic foams, etc.
3. Rigorous dust control.
4. Periodic examination of workers; biological monitoring(clinical, X-ray, lung function, scanning of fibers with electron microscopic).
5. Continuing research

Farmer's lung

- It is due to inhalation of mouldy hay / grain dust.
- In grain dust / hay with a moisture content of over 30%bacteria and fungi grow rapidly, causing a rise of temperature to 40 to 50 degree C.
- **Micropolyspora faeni** is the main cause.
- Repeated attacks cause pulmonary fibrosis and inevitable pulmonary damage and corpulmonale.

Clinical picture of lead poisoning

- The clinical picture of lead poisoning or plumbism is different in the inorganic and organic lead exposures.
- The toxic effects of ***inorganic*** lead exposure are abdominal colic, obstinate constipation, loss of appetite, blue-line on the gums, stippling of red cells, anaemia, wrist drop and foot drop.
- The toxic effects of ***organic*** lead compounds are mostly on the central nervous system - insomnia, headache, mental confusion, delirium, etc.

Preventive measures for lead poisoning

1. **Substitution:** That is, where possible lead compounds should be substituted by less toxic materials.
2. **Isolation:** All processes which give rise to harmful concentration of lead dust or fumes should be enclosed and segregated.
3. **Local exhaust ventilation:** There should be adequate local exhaust ventilation system to remove fumes and dust promptly
4. **Personal protection:** Workers should be protected by approved respirators.
5. **Good house-keeping:** Good house-keeping is essential where lead dust is present. Floors, benches, machines should be kept clean by wet sweeping.
6. **Working atmosphere:** Lead concentration in the working atmosphere should be kept below 2.0 mg per 10 cu. metres of air, which is usually the permissible limit or threshold value.

Management of lead poisoning

- Prevention of further absorption, the removal of lead from soft tissues and prevention of recurrence.
- Early recognition of cases will help in removing them from further exposure.
- A saline purge will remove unabsorbed lead from the gut. The use of d-penicillamine has been reported to be effective. Like Ca- EDTA, it is a chelating agent and works by promoting lead excretion in urine.

Control of Industrial Cancer

1. Elimination or control of industrial carcinogens.
2. Technical measures like exclusion of the carcinogen from the industry, well-designed building or machinery, closed system of production, etc.,
3. Medical examinations
4. Notification
5. Licensing of establishments
6. Personal hygiene measures
7. Education of workers and management
8. Research

Preventive measures of radiation hazards

1. Inhalation, swallowing or direct contact with the skin should be avoided.
2. In case of X-rays, shielding should be used of such thickness and of such material as to reduce the exposure below allowable exposures.
3. The employees should be monitored at intervals not exceeding 6 months by use of the film badge or pocket electrometer devices.
4. Suitable protective clothing to prevent contact with harmful material should be used.
5. Adequate ventilation of work-place is necessary to prevent inhalation of harmful gases and dusts.
6. Replacement and periodic examination of workers should be done every 2 months. If harmful effects are found, the employees should be transferred to work not involving exposure to radiation
7. Pregnant women should not be allowed to work in places where there is continuous exposure.

Physical Hazards

Physical Hazards Includes :

- ✓ Heat
- ✓ Cold
- ✓ Light
- ✓ Pressure
- ✓ Noise
- ✓ Radiation
- ✓ Mechanical factors
- ✓ Electricity
- ✓ Vibrations

Heat

Cause : Steel and Glass Industries , Mines etc.

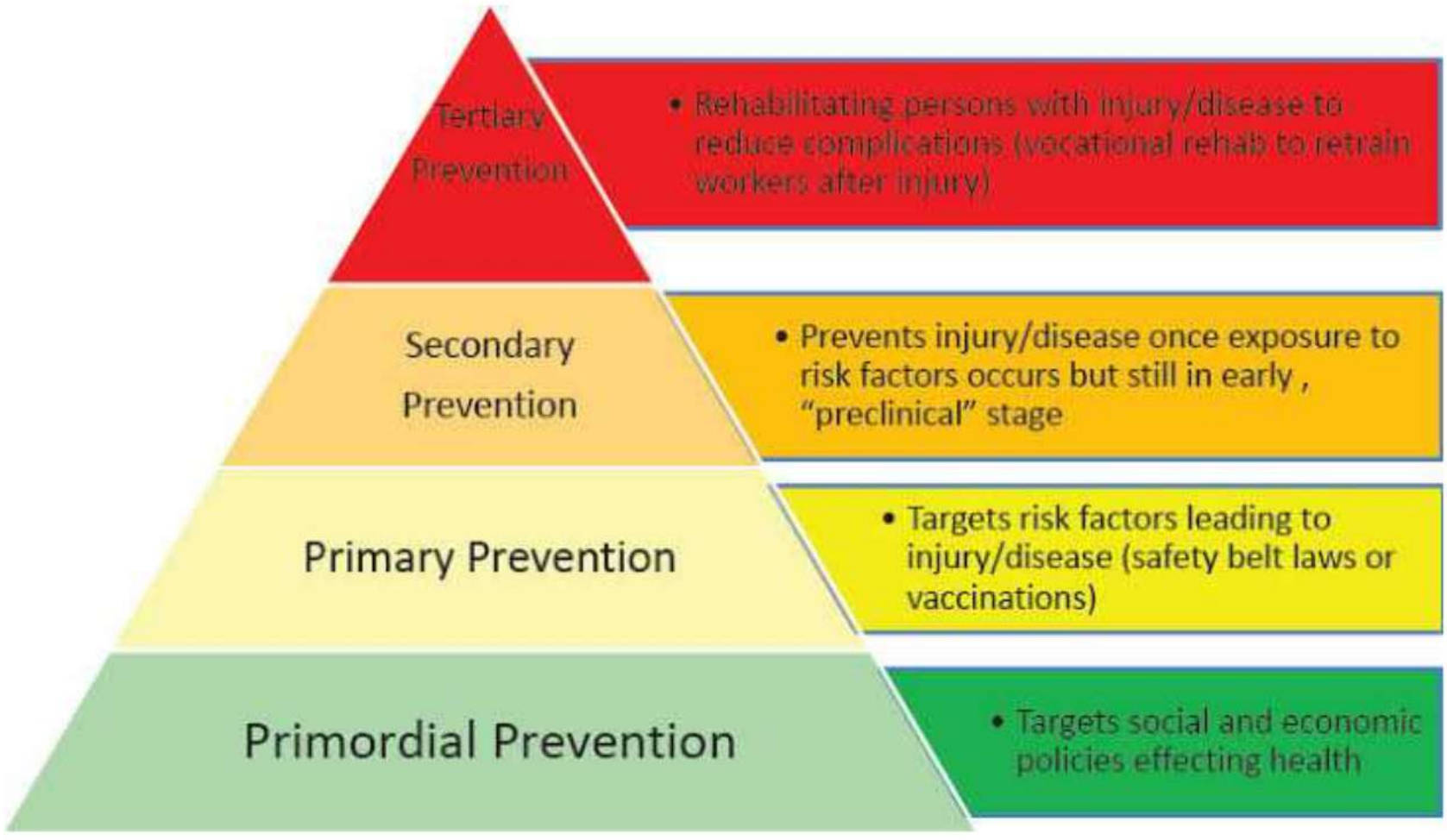
Includes :

- ✓ Burn Injury
- ✓ Heat Syncope
- ✓ Heat Cramps
- ✓ Heat Hyper pyrexia
- ✓ Heat Exhaustion
- ✓ Heat Strokes.

Physical Hazards

(Cold)

- Trench foot :
- Cause : Wet foot ,
- Occurs due to impression of foot in cold water / snow .
- Symptoms :Swelling and paleness of foot



* Primordial Prevention → prevention of Risk Factors
  e.g promoting healthy eating habits from young age,
  encouraging Regular physical Activity

* Primary Prevention → prevention of Disease
  e.g vaccination,
  Screening for diseases like breast cancer

* Secondary Prevention → Detect and treat early disease, reducing the risk of complications
  e.g Regular BP checks to detect HTN,
  Mammography to detect breast cancer

* Tertiary Prevention → Manage and treat disease, reducing its impact and prevent complications
  e.g Medication management for chronic diseases like diabetes and HTN,
  Rehabilitation programs for stroke or injury

- Health Insurance or medical Insurance is a type that covers the whole or apart of the risk of a person incurring Medical Expenses.
- An induvial can avail such policies against month or annual premium payments .

Types of Health Insurance

1. Induvial Health Insurance
2. Senior Citizen health insurance
3. Group Health Insurance
4. Health Insurance with maternity insurance
5. Critical Illness

"Safe motherhood" means **maternal services provided to women during antenatal, delivery and post-partum periods**

To improve the wellbeing of mothers through a comprehensive approach of providing preventive, promotive, curative and rehabilitative health care.

It has 6 Pillars
1-Family planning
2-Antenatal care
3-Perinatal care/Safe Delivery
4-Essential obstetric and post natal care
5-Abortion care
6-STD/HIV control

TT vaccine given (Tetanus Toxoid) 5 doses

- First 7 month → monthly
- Next 2 months → Twice monthly
  Then weekly
- At least 4 Antenal visits Required

Antenatal visits schedule

IDEALLY
First 28 weeks- once a month
Up to 36 weeks – twice a month
There after weekly till delivery
MINIMUM – 4 antenatal visits
1st visit around 16 weeks
2nd visit between 24 and 28 weeks
3rd visit at 32 weeks
4th visit at 36 week

IMMUNIZATION OF WOMEN

- Along with 3rd dose of TT inj
- If she is Rh negative and baby is Rh positive then within 24 hours 300 mg of Rh immunoglobulin should be given within 24-48 hours of delivery.

EPI Schedule

At Birth
- BCG
- OPV 0

6 weeks
- Penta 1
- Pneumococcal 1
- Rotal virus 1

10 weeks
- Penta 2
- Pneumococcal 2
- OPV 2
- Rota virus 2

14 weeks
- Penta 3
- Pneumococcal 3
- OPV 3
- IPV 1

9 Months
- MR 1
- IPV 2
- TCV (Typhoid)

15 Months
- MR 2

- Pentavalent
  - Diphtheria
  - Pertussis
  - Tetanus
  - Hepatitis B
  - H influenza Type B

IMNCI

Integrated Management of Newborn and childhood Illnesses

IMNCI caters two groups of children

0–2 months young infants
2 months to 5 years children

What is IMNCI ?

• IMNCI is an **integrated approach** to child health that focuses on the well-being of the whole child. IMNCI aims to reduce death, illness and disability, and to promote improved growth and development among children under five years of age.

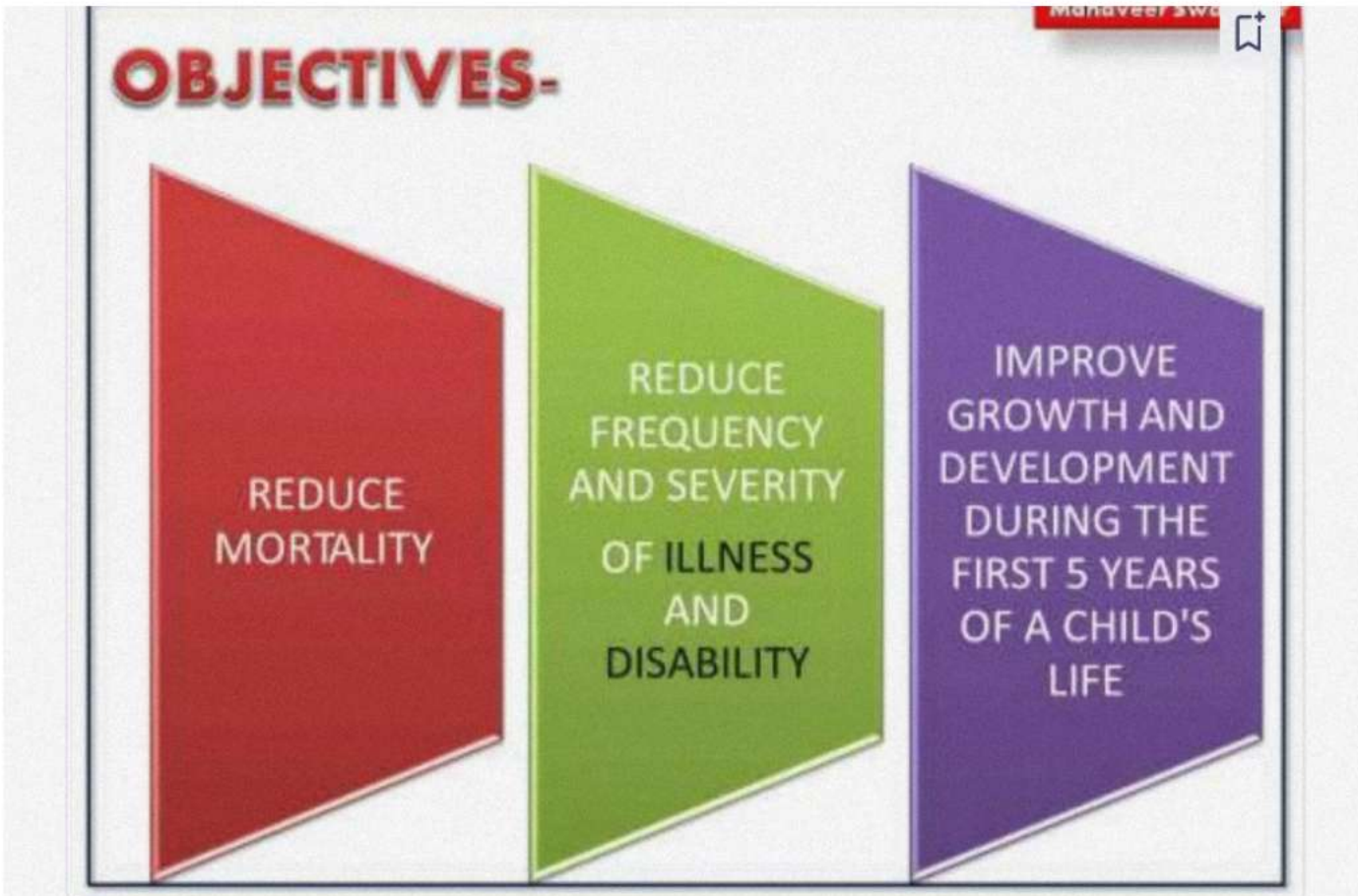
• IMNCI includes both preventive and curative elements that are implemented by families and communities as well as by health facilities.

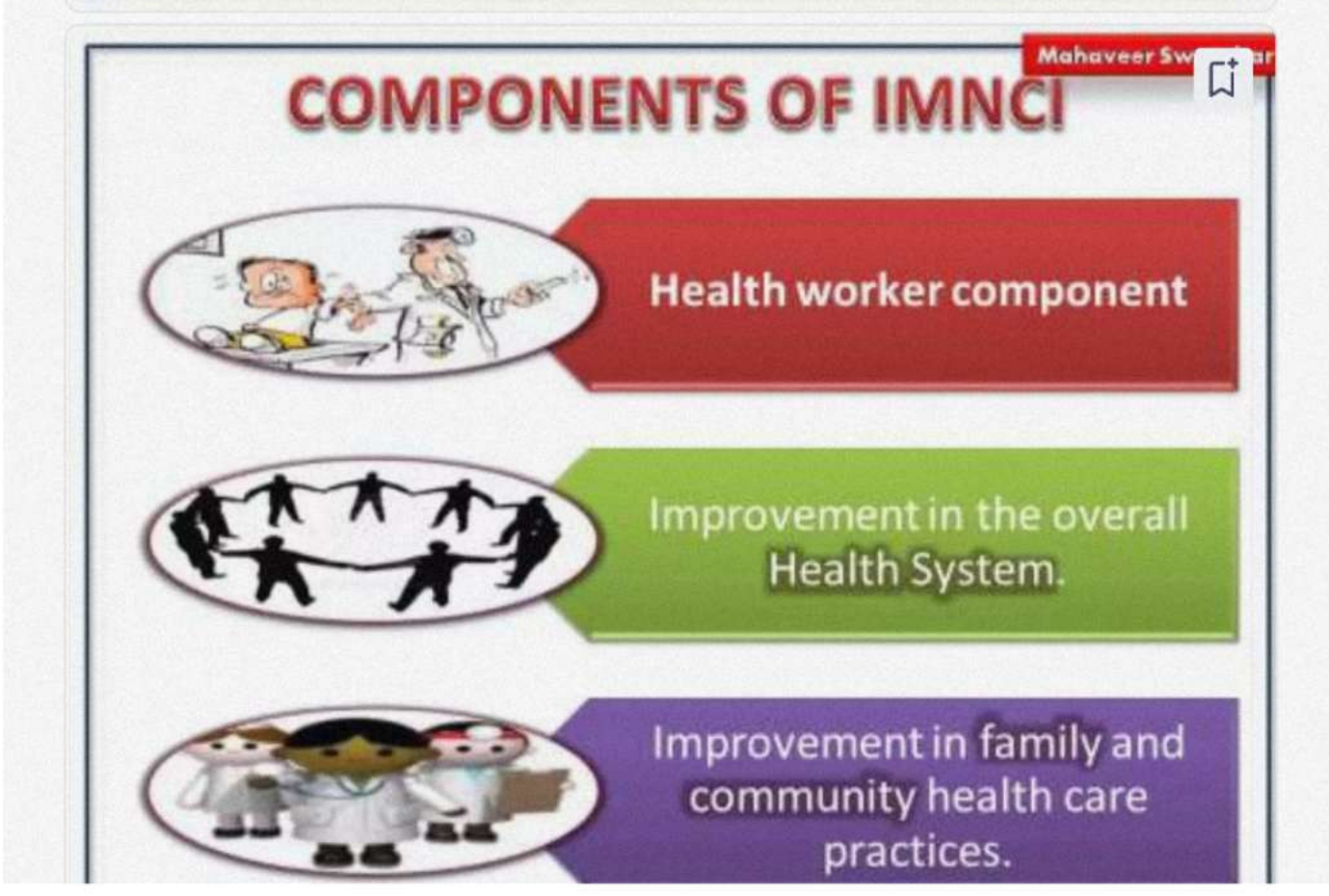
•The strategy includes three main components:

- **Improving case management skills of health-care staff**
- **Improving overall health systems**
- **Improving family and community health practices.**

5 Major Diseases
Pneumonia
Diarrhea
Malaria
measles
Malnutrition

IMNCI


OBJECTIVES-
REDUCE MORTALITY
REDUCE FREQUENCY AND SEVERITY OF ILLNESS AND DISABILITY
IMPROVE GROWTH AND DEVELOPMENT DURING THE FIRST 5 YEARS OF A CHILD'S LIFE


COMPONENTS OF IMNCI
Health worker component
Improvement in the overall Health System.
Improvement in family and community health care practices.

IMNCI

Elements of case management process

- **Assess** - Child by checking for danger signs by history and examination.
- **Classify** - Child's illness by color coded triage system.
- **Identify** - Specific treatments.
- **Treatments**- Instructions of oral drugs, feeding & fluids.
- **Counsel** - Mother about breast feeding & about her own health as well as to follow further instructions on further child care.
- **Follow up care -** Reassess the child for new problems.

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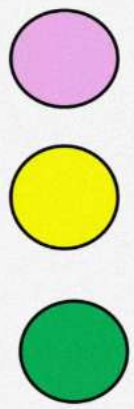
Principles of integrated care (Contd. .)

A combination of individual signs leads to a child's classification(s) rather than diagnosis.



- *needs urgent hospital referral or admission (classifies as and colour coded pink)*
- *needs specific medical Rx or advice (classified as and colour coded yellow)*
- *can be managed at home (classified as and colour coded green)*

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It is customary to divide the childhood into the following age-periods :

1. Infancy (upto 1 year of age)
   a. Neonatal period (first 28 days of life)
   b. Post neonatal period (28th day to 1 year)
2. Pre-school age (1–4 years)
3. School age (5–14 years)

For A Child upto 2 months

* LOOK FOR
  - Bacterial Infection
  - Jaundice
  - Body Temp
  - Dehydration
* Assess breast feeding
* Immunization Status
* Councel the mother

For A Child → 2 months to 5yrs

* Look for
  - Cough or Difficulty breathing → Pneumonia
    - Count breaths
    - Look for chest indrawing
    - Look for Stridor
* Dehydration
* Fever
  - look for signs of malaria or measles
* Ear Problems
* Malnutrition and anemia
* Immunization Status

LOOK FOR SIGNS OF MEASLES

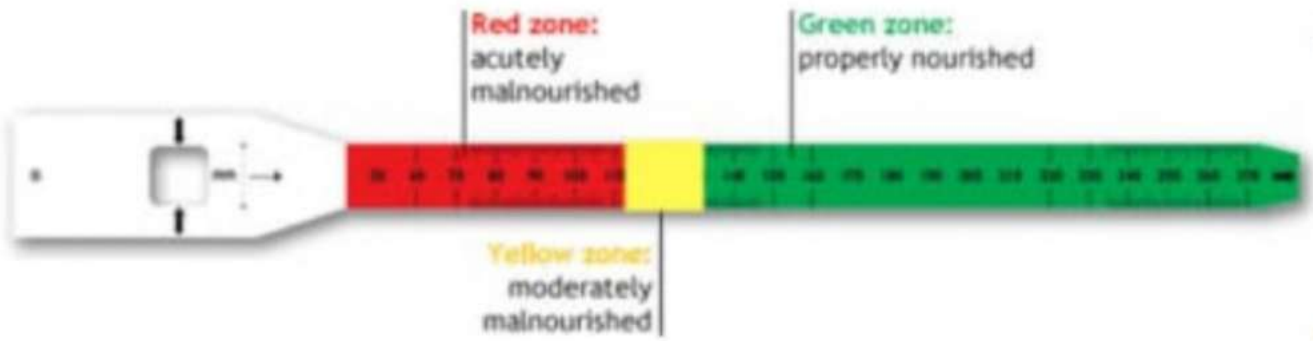
has measles now or within the last 3 months

-Rash	-Mouth ulcers
-Cough	-Pus from eyes
-Runny nose	-Clouding of cornea
-Red eyes	

Graves Disease

SHAKIR TAPE METHOD

- measures Mid Upper Arm Circumference (MUAC)
- used to diagnose undernutrition



Red : <12.5cm (Wasted)

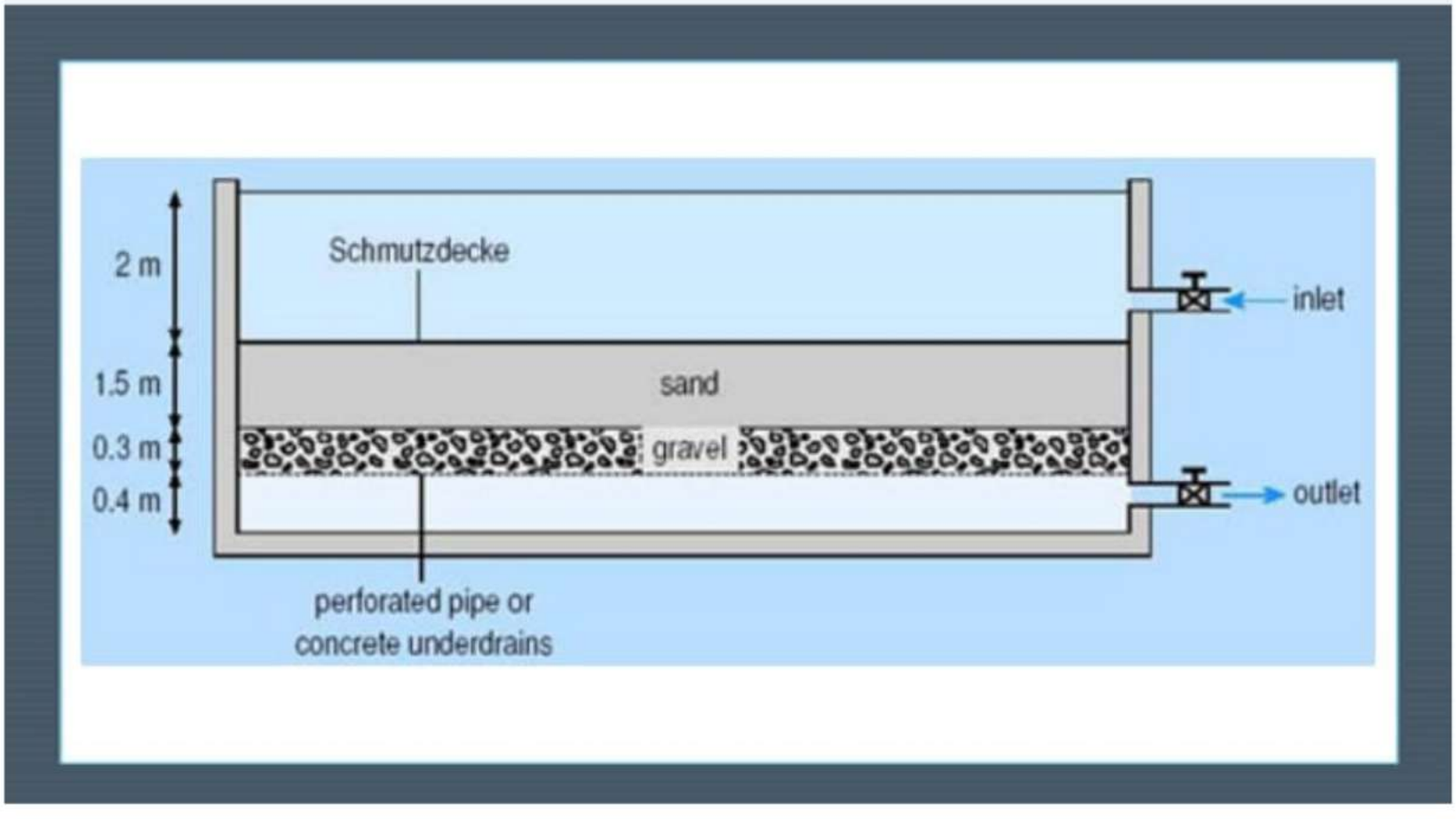
Yellow : 12.5 - 13.5cm (Boderline)

Green : >13.5cm (Normal)

Body Mass Index:

BMI = Weight in Kg /Height in m^2

Classification	BMI	Risk of co-morbidities
Under wt.	< 18.50	Low
Normal	18.5-24.99	Normal
Over wt.	> 25	Average
Pre-obese	25-29.99	Increased
Obese class I	30-34.99	Moderate
Class II	34.99-40	Severe
Class III	>40	Very severe



Pharmacology

DRUGS FOR BPH

Pharmacotherapy for BPH [11][12]

Agent	Description	Agents
Alpha blockers	• **Mechanism of action** Inhibition of α1-receptors (α1A-receptors) in the bladder neck and the prostatic urethra → relaxation of the smooth muscle of the bladder neck and the urethra → ↓ resistance to urinary outflow → symptomatic improvement • **Treatment outcome**: symptom control [12]	• Tamsulosin • Doxazosin • Alfuzosin • Terazosin
5-alpha reductase inhibitors (5-ARIs)	• **Mechanism of action** Inhibition of 5-alpha reductase → ↓ conversion of testosterone to DHT → ↓ intraprostatic DHT levels → ↓ prostatic growth and ↑ prostatic apoptosis and involution → improvement of LUTS [12] • **Treatment outcomes** [12] ◦ Reduction of prostate volume ◦ Decreased risk of acute urinary retention • **Adverse effects**: sexual dysfunction (e.g., erectile dysfunction, decreased libido, ejaculatory dysfunction), gynecomastia [12]	• Finasteride • Dutasteride
Antimuscarinics	• **Mechanism of action** Inhibition of parasympathetic muscarinic receptors on detrusor smooth muscle cells → ↓ muscle tone → symptomatic improvement of OAB symptoms; see "Muscarinic antagonists" [12]	• Tolterodine • Darifenacin • Solifenacin • Oxybutynin • Trospium
Phosphodiesterase type 5 inhibitors	• **Mechanism of action** Increase in intracellular cGMP → ↓ detrusor, prostate, and urethra muscle tone → improvement of LUTS [12]	• Tadalafil

5-ARIs are also used in the management of androgenetic alopecia in males

Adverse effects of alpha blockers include orthostatic hypotension (relevant for elderly patients who are prone to falls) and intraoperative floppy iris syndrome (relevant for patients who are due to undergo cataract surgery). [12]

Preferred first-line options [11][12]

Indications		Preferred agent
LUTS predominantly caused by BOO	**Small prostate (< 40 mL) and/or serum PSA < 1.5 ng/mL**	Alpha blocker [8]
	Large prostate (> 40 mL) and/or serum PSA > 1.5 ng/mL	5-alpha reductase inhibitors (5-ARIs) [27]
	Severe symptoms or an inadequate response to monotherapy	Combination therapy: alpha blocker PLUS a 5-ARI
LUTS predominantly caused by OAB		Antimuscarinic (see also "Urge incontinence")
LUTS caused by mixed BOO and OAB		An alpha blocker PLUS an antimuscarinic
LUTS associated with erectile dysfunction		Phosphodiesterase 5 inhibitor [12]

Antimuscarinics should be used with caution in patients with a PVR volume > 250 mL as they can decrease bladder strength and potentially lead to urinary retention. [11][12]

- LUTS → Lower urinary tract symptoms
- BOO → Bladder Outlet Obstruction
- OAB → Over Active Bladder

Reproductive Pharma

Drug class	Examples	Mechanism of action	Indications	Side effects
Selective estrogen receptor modulators (SERMs)	• Tamoxifen	• Competitive antagonist on the estrogen receptors of the breast → ↓ breast cancer cell growth • Agonist on estrogen receptors in the following tissues: ◦ Bone tissue → inhibition of osteoclasts → ↓ risk of osteoporosis and fractures ◦ Endometrium → ↑ proliferation [9] ◦ Myometrium → ↑ proliferation	• Premenopausal estrogen receptor-positive breast cancer • Vaginal atrophy (related to menopause) • Prostate cancer: prevention of gynecomastia	• Hot flashes • ↑ Risk of endometrial cancer [9] • ↑ Risk of thromboembolic events (e.g., pulmonary embolism, DVT) • ↑ Risk of uterine sarcoma
	• Raloxifene	• Competitive antagonist on estrogen receptors in the following tissues: ◦ Breast → ↓ breast cancer cell growth ◦ Endometrium and myometrium → ↓ proliferation (in contrast to tamoxifen) • Agonist on estrogen receptor in bone tissue → inhibition of osteoclasts	• Prophylaxis of breast cancer in high-risk patients • Osteoporosis in older patients (if bisphosphonates are contraindicated)	• ↑ Risk of venous thromboembolism and cataracts (lower risk than with tamoxifen) [10] • Hot flashes [10] • ↓ Risk of endometrial cancer and uterine sarcoma
	• Clomiphene (Anti estrogen)	• Blocks hypothalamic estrogen receptors, thereby inhibiting negative feedback and increasing release of FSH and LH to trigger ovulation	• Infertility (for ovulation induction)	• Hot flashes • Multiple simultaneous pregnancies • Visual disturbances [11]
Synthetic estrogens [12]	• Ethinyl estradiol • Mestranol • Diethylstilbestrol (DES)	• Activation of estrogen receptors	• Hormone replacement therapy • Combined oral contraception • Hypogonadism	• Endometrial cancer • Thromboembolic events • Vaginal clear cell adenocarcinoma (in patients exposed to DES in utero) • ↑ Risk of cardiovascular conditions (e.g., myocardial infarction, hypertension)
Aromatase inhibitors	• Anastrozole • Letrozole • Exemestane	• Inhibition of aromatase → ↓ conversion of androstenedione to estrone, ↓ conversion of testosterone to estradiol → ↓ tumor growth ↓ estrogen levels	• Postmenopausal estrogen receptor-positive breast cancer [13][14] • Letrozole: used for ovulation induction (e.g., in PCOS)	• Hot flashes, night sweats • Vaginal dryness • ↑ Risk of osteoporosis • Myalgia, arthralgia
Androgen agonists	• Danazol (synthetic androgen)	• Partial agonist action on androgen receptor • Suppress endometrial estrogen and progesterone receptors [15]	• Endometriosis • Uterine leiomyoma • Hereditary angioedema [16]	• Weight gain, edema • Acne • Hirsutism • ↓ HDL levels • Hepatotoxicity • Idiopathic intracranial hypertension

Drug class	Examples	Mechanism of action	Indications	Side effects
Antiandrogens	• Finasteride	• Inhibits 5 alpha reductase	• Benign prostatic hyperplasia • Androgenetic alopecia	• Gynecomastia • Sexual dysfunction
	• Flutamide • Bicalutamide • Apalutamide • Enzalutamide	• ↓ Steroid binding; achieved via nonsteroidal competitive inhibition at androgen receptors	• Metastatic prostate cancer in combination with GnRH analogs for medical castration • Hirsutism (e.g., PCOS) • Androgenetic alopecia in female individuals	• Gynecomastia • Hypogonadism in males • Hepatotoxicity
	• Cyproterone	• Block androgen receptor • Progesterone-like effects	• Prostate cancer • Hirsutism • Precocious puberty • Hypersexuality	
	• Spironolactone	• Blocks androgen receptor • Inhibits 17,20-desmolase and 17 alpha-hydroxylase • Inhibits 5-alpha reductase enzyme	• Androgenic effects of PCOS (e.g., hirsutism) • Androgenetic alopecia in female individuals	• Gynecomastia • Breast tenderness • Amenorrhea
	• Ketoconazole	• Inhibits several steps of adrenal sterol synthesis (e.g., 17,20-desmolase, 17 alpha-hydroxylase)	• Androgenic effects of PCOS (e.g., hirsutism) • Peripheral precocious puberty (e.g., McCune-Albright syndrome) • Cushing syndrome • Advanced prostate cancer [17]	• Gynecomastia • Amenorrhea • CYP 450 inhibitor • Hepatotoxicity • QTc prolongation
Anabolic steroids [12]	• Methyltestosterone • Oxandrolone • Fluoxymesterone	• Activate androgen receptors (synthetic derivatives of testosterone)	• Stimulation of anabolism following severe trauma, infection, surgery, etc. • Methyltestosterone and fluoxymesterone ◦ Hypogonadism ◦ Delayed puberty in male individuals ◦ Metastatic breast cancer in postmenopausal individuals • Often misused to enhance physical and athletic performance	• In male individuals ◦ Prolonged penile erections ◦ Hypogonadism (gynecomastia) in individuals with prior normal testicular function • In female individuals ◦ Virilization ◦ Irregular menses • In both sexes ◦ Acne, hair loss ◦ Hepatotoxicity ◦ Premature bone maturation and closure of epiphyseal plates ◦ Dyslipidemia (↑ LDL, ↓ HDL) ◦ Mood changes
Progestins [12]	• Levonorgestrel • Medroxyprogesterone • Megestrol acetate • Norethindrone • Etonogestrel	• Activate progesterone receptors	• Contraception (alone or in combination with estrogens) • Abnormal uterine bleeding • Progesterone challenge test • Endometrial cancer • Endometriosis	• Breakthrough bleeding • Venous thromboembolism • Dizziness • Bloating • Weight gain
Antiprogestins [12]	• Mifepristone	• Blocks progesterone receptors in the corpus luteum, leading to its dehiscence [18]	• Pregnancy termination	• Nausea • Abdominal pain • Headache • Weakness
	• Ulipristal	• Selective progesterone receptor modulators that affect ovulation and implantation [19]	• Emergency contraception	

Growth Hormone Agonists

Recombinant Human GH– Somatropin, Somatrem
Recombinant IGF-1 – Mecasermin
Synthetic Analogue of Somatostatin – Octreotide, Lanreotide

Drugs used to treat Acromegaly

1. Somatostatin Analogues ↳GH Antagonists
   - Octreotide
   - Lanreotide
2. Dopamine Receptor Agonists
   - Bromocriptine
   - Cabergoline
3. GH-receptor Antagonist
   - Pegvisomant

Bromocriptine increase GH level in normal individuals, but in patients with acromegaly, it acts paradoxically to reduce GH levels

GnRH Agonists

- Gonadorelin → synthetic human GnRH
- Leuprolide
- Nafaralin
- Buserelin
- Goserelin
- Triptorelin

GnRH Antagonists

- Cetrorelix
- Ganirelix
- Abarelix
- Degarelix

T_x of Hyperprolactinemia

* Dopamine Receptor Agonists → other uses
  - Bromocriptine
  - Cabergoline → DOC
  - Pergolide

other uses
- Hyperprolactinemia
- Acromegaly
- Parkinsonism
- Restless leg syndrome

T_3 and T_4 Preparations

- Levothyroxine sodium → T_4
- Liothyronine → T_3

Anti Thyroid Drugs

Thyroid Hormone Synthesis Inhibitors
(Thio amides)

→ inhibition of Thyroid peroxidase

PMC

- Propylthiouracil
- Methimazole
- Carbimazole

Inhibitors of Iodide Trapping

- Thiocyanates
- Percholates

Hormone Release Inhibitors

- Iodine (Lugol's Iodine)
- Organic Iodide
- iodides of Sodium and potassium

Thyroid Tissue Destroying Agent

- Radioactive Iodine (I–131)

Others

- Propranolol
- Atenolol
- Diltiazem
- Dexamethasone

Hyperthyroid Medications

- **Propylthiouracil (PTU)**
  - Inhibits TPO: ↓ T3/T4 from thyroid gland
  - Inhibits 5'-deiodinase: ↓ T4 to T3 conversion peripherally
- **Methimazole**
  - Inhibits TPO
- **Propranolol**
  - Beta blocker
  - Weak inhibitor of 5'-deiodinase
  - Excellent drug in thyrotoxicosis
  - Blocks catecholamines and T4-T3 conversion

PTU and Methimazole are both "thioamides"

Overview of antithyroid drugs

	Thionamides	Potassium iodides
Examples	• Methimazole • Carbimazole • Propylthiouracil	• Lugol's iodine (oral potassium iodide) • Saturated solution of potassium iodide (SSKI)
Mechanism of action	• Inhibits thyroid hormone production via inhibition of thyroid peroxidase → blockade of iodide oxidation, organification, coupling • Propylthiouracil also lowers peripheral conversion of T4 to T3 by inhibiting 5'-deiodinase. 5' deiodinase convert T_4 to T_3	• Inhibit proteolytic cleavage of T3 and T4 from thyroglobulin → inhibits thyroid hormone release • Also decrease thyroid vascularity and decrease the size of the gland
Onset	• Slow onset of action (3–4 weeks) • Methimazole has a faster onset of action and fewer side effects than propylthiouracil	• Rapid onset of action (within a week)
Indications	• Hyperthyroidism • Thyroid storm • After radioactive iodine treatment • Before radioactive iodine treatment or thyroidectomy	• Pretreatment before thyroid surgery • Adjunctive therapy in thyroid storm • Adjunctive therapy in hyperthyroidism • Used as prophylaxis to decrease radioactive iodine uptake in the thyroid gland

Special considerations	• Thionamides, which are used to treat hyperthyroidism in Graves disease, are ineffective against Graves ophthalmopathy, which is treated with glucocorticoids.
	• In pregnancy
	  ◦ 1st trimester: Propylthiouracil is recommended.
	  ◦ 2nd/3rd trimester: carbimazole or methimazole
		• Contraindicated in pregnancy

TPO

Thyroid Peroxidase

- Multifunctional enzyme
- Catalyzes:
  - Oxidation of iodide
  - Organification of iodine into MIT/DIT
  - Coupling of MIT/DIT into T3/T4
- TPO antibodies common in autoimmune thyroid disease

Adverse effects

Thionamides

- **Allergy/hypersensitivity**
  - The most common side effect is a pruritic rash (particularly with methimazole)
  - Rarely, severe effects such as exfoliative dermatitis, ANCA-associated vasculitis (propylthiouracil), polyserositis, and acute arthralgia occur
  - If mild, switch to propylthiouracil; if severe, avoid thioamides because of the risk of cross-sensitivities
- **Hematologic side effects**
  - Agranulocytosis
    - Rare but dangerous (affects ~ 0.5% of patients; more common in elderly and those taking high doses)
    - Rapidly reversible with discontinuation of treatment
  - Aplastic anemia
  - Thrombocytopenia
- **Hepatotoxicity** (seen with propylthiouracil use)
  - Hepatitis
  - Cholestatic jaundice
  - Liver failure
- Teratogenicity: increased risk of congenital malformations with carbimazole and methimazole (e.g., aplasia cutis)
- **Other**
  - Diffuse goiter
  - Impaired sense of taste (dysgeusia)

As methimazole and carbimazole are teratogenic, propylthiouracil is recommended in the first trimester. After the first trimester, switch back to carbimazole or methimazole because of the hepatotoxic effects of propylthiouracil.

Iodides

- Side-effects are rare and often mild.
- Oral/gastric mucosal irritation (e.g., aphthous ulcers, metallic taste): To avoid mucosal irritation, iodides should be consumed with food or diluted with fluids.
- Allergy/hypersensitivity: rash, angioedema; rarely, severe anaphylactic reactions can occur
- Teratogenicity: contraindicated in pregnancy because they can cross the placental barrier and cause fetal goiter
- Iodides delay and decrease the effects of radioactive iodine. They must be stopped at least a week before radioactive iodine ablation.

Natural Androgens

Testosterone
Dihydrotestosterone
Dehydroepiandrosterone
Androstenedione

Synthetic Androgens (Anabolic Steroids)

Mnemonic: My NOSE

Methandienone
Nandrolone phenyl propionate
Nandrolone decanoate
Oxandrolone
Stanozol
Ethyl estrenol

Androgen Agonist

Danazol → weak androgenic, glucocorticoid and progestational activities

Anti Androgens

Physiological Antagonist

- Estrogens

Testosterone Synthesis Inhibitors

- Ketoconazole
- Spironolactone

Androgen Receptor Antagonist

- Flutamide
- Bicalutamide
- Cyproterone
- Spironolactone

5- α Reductase Inhibitors

- finasteride
- Dutasteride

Estrogens

Natural Estrogens

- Estradiol
- Estrone
- Estriol

Synthetic Estrogens

Steroidal

- Ethinyl Estradiol
- Mestranol
- Tibolone

Non steroidal

- Diethylstilbesterol (DES)
- Dienestrol

Anti Estrogens

- Clomiphene citrate
- Fulvestrant

Selective Estrogen receptor Modulator (SERM)

- Tamoxifen
- Raloxifene
- Ormeloxifene

Aromatase Inhibitors

- Exemastane
- Letrozole
- Anastrozole

Mnemonic : Let's Eat Aromatase

Lets → Letrozole

Eat → Exemestane

Aromatase → Anastrozole

Synthetic Progestins

Progesterone Derivatives

Medroxyprogesterone acetate
Hydroxyprogesterone caproate
megestrol acetate

19- Nortestosterone Derivatives

Norethindrone (Norethisterone)
Norgestrel
Levonorgestrel
Desogestrel
Gestodene
Norgestimate

Anti progestin

Mifepristone

Absolute Contraindications of cocps

* Thromboembolic disorders
* Malignancy of genital tract
* severe HTN
* Cardiac diseases
* Porphyria
* Acute Liver Disease

Relative Contraindications of COCPs

* Obesity
* Diabetes
* Migraine
* Mild HTN
* Uterine fibroid

Contraceptives

- COCPs → Progestins + Estrogen
- Progestin-only Pill (Minipill)
  - Norethindrone or norgestrel
- Postcoital Pill (Emergency Contraception)
  - Levonorgestrel, or
  - Ulipristal, or
  - Mifepristone
- Injectible contraceptives
  - DMPA (Depot Medroxy progesterone Acetate) → once in 3 months
  - NET-EN (Norethindrone enanthate) → once in 2 months
- Implants
  - Norplant → last for 5 yrs → Subdermal 6 flexible rods containing 216 mg of LNG
  - Implanon → last for 3 yrs → subdermal single rod containing 68 mg of desogestrel
- Intra Uterine Devices
  - Levonorgestrel device → last for 5 yrs
  - Progestasert

INSULIN PREPARATIONS

* Conventional Insulin Preparations
  - Bovine (beef) insulin
  - Porcine (pig) insulin

* Human Insulins

* Insulin Analogues

Rapidly Acting Insulin Analogues → Onset of Action : 5-15 min, Duration of Action : 4 hrs
  - Insulin Lispro
  - Insulin Aspart
  - Insulin Glulisine

Glu Lay Ao

Short Acting Insulin → onset : within 30 min, Duration : 6-8 hrs
  - Zinc Insulin

Intermediate Acting Insulin → Onset : , Duration : 10-20 hrs
  - NPH (Neutral Protamine Hagedorn) Insulin
  - Isophane Insulin

Long Acting Insulin → Onset : 24 hrs
  - Insulin Glargine
  - Insulin detemir

Noninsulin antidiabetics

Noninsulin antidiabetics for the treatment of type 2 diabetes mellitus [32]

Drug class	Examples	Important considerations
Biguanides activates enzyme AMP dependent protein kinase	• Metformin	• Drug of choice, unless there are contraindications for metformin Prolonged use can cause Vit B12 deficiency
Dipeptidyl peptidase-4 (DPP-4) inhibitor inhibit enzyme DPP-4 which prevent inactivation of GLP-1	• Sitagliptin • Saxagliptin • Linagliptin • Vildagliptin (associated with hepatotoxity)	• Avoid saxagliptin in patients with heart failure.
SGLT-2 inhibitors inhibit SGLT-2 in renal proximal tubule ↓ inhibit glucose reabsorption ↓ glycosuria, decrease blood glucose levels	• Empagliflozin Dapagliflozin Canagliflozin Empagliflozin	• Consider in patients with clinical ASCVD or high risk of ASCVD, chronic kidney disease, or congestive heart failure. • Beneficial for patients who need to lose or maintain their weight ·can cause UTI

GLP-1 receptor agonists
GLP-1 stimulates glucose dependent insulin secretion, suppresses glucagon release and slows gastric emptying
	• Semaglutide
	  ○ Oral
	  ○ Injectable
	Exenatide
	Liraglutide
	Albiglutide
	Dulaglutide
	Lixisenatide
	• Other subcutaneous GLP-1 receptor agonists
	  ○ Daily liraglutide
	  ○ Weekly dulaglutide
		• Consider in patients with clinical ASCVD, high risk of ASCVD, or chronic kidney disease.
		• Beneficial for patients who need to lose or maintain their weight

Sulfonylureas stimulate insulin secretion from beta cells of pancreas	• Glimepiride Glyburide ← Glibenclamide Chlorpropamide First Gen -Tolbutamide 2nd Gen -Glyburide -Glipizide -Gliclazide -Glimepiride	• Increases risk for hypoglycemia • Low cost ineffective in Type 1 DM bcz at least 30% functioning beta cells are necessary Teratogenic chlorpropramide has disulfuram like action, hence produce intolerance to alcohol
Thiazolidinedione increase sensitivity of peripheral tissues to insulin	• Pioglitazone	• Avoid in patients with congestive heart failure. • Low cost

Meglitinide
↙ Analogue

Repaglinide

stimulate insulin secretion from beta cells of pancreas

↑ D-phenylalanine derivative

Nateglinide

Alpha-Glucosidase Inhibitors

reduce intestinal absorption of carbohydrates by inhibiting The enzyme alpha glucosidate in the brush border of small intestine and reduce postpandrial hyperglycemia

Acarbose
miglitol
voglibose

mainly used in obese patients with Type 2 DM

Interpretation of hyperglycemia tests [25]

	FPG	2-hour glucose value after OGTT	HbA1c
Diabetes mellitus	**≥ 126 mg/dL** (≥ 7.0 mmol/L)	**≥ 200 mg/dL** (≥ 11.1 mmol/L)	**≥ 6.5%**
Prediabetes	100–125 mg/dL (5.6–6.9 mmol/L) = **impaired fasting glucose**	140–199 mg/dL (7.8–11.0 mmol/L) = **impaired glucose tolerance**	5.7–6.4%
Normal	**< 100 mg/dL** (< 5.6 mmol/L)	**< 140 mg/dL** (< 7.8 mmol/L)	**< 5.7%**

Relative potency of systemic corticosteroids [1][3]		
Duration of action	**Drug**	**Common routes of administration**
Systemic glucocorticoids		
Short-acting (8–12 hours)	**Hydrocortisone**	• Oral • Injectable • Topical
	Cortisone	• Oral • Injectable

Intermediate-acting (12–36 hours)	**Prednisolone**	• Prednisone: oral
		• Prednisolone:
		  ◦ Oral
		  ◦ Injectable

	Prednisone	
	Methylprednisolone	• Oral • Injectable
	Triamcinolone	• Injectable [5][6][7] • Topical
Long-acting 36–72 hours	**Dexamethasone**	• Oral • Injectable • Topical
	Betamethasone	• Oral • Injectable • Topical
Systemic mineralocorticoid		
Intermediate-acting 12–36 hours	**Fludrocortisone**	• Oral

Effects of glucocorticoids

Organ/System of organs	Effects
Skin	• Poor wound healing, **skin atrophy**, and **stretch marks** due to impaired fibroblast activity and thus, impaired collagen synthesis • Purpura • **Steroid acne** • **Hypertrichosis** • Increased risk of squamous and basal cell carcinomas

Cardiovascular system	• Hypertension, most likely due to
	  ◦ Increased sensitivity to catecholamines due to the upregulation of alpha-1 receptors
	  ◦ Mineralocorticoid activity at high concentrations

Metabolism, electrolytes and endocrine system	• **Weight gain** with truncal obesity, **buffalo hump**, and **moon face** (**Cushingoid appearance**) • Proteolysis and lipolysis: proteolysis contributes to hyperglycemia whereas lipolysis leads to hyperlipidemia and eventually to redistribution of fat tissue towards the trunk. • Increased gluconeogenesis, lipolysis, and proteolysis • **Hyperglycemia** and ↑ insulin resistance → **glucocorticoid-induced** diabetes • Decreased glucose utilization in skeletal muscle and white adipose tissue (due to antagonization of insulin response) • Hypocalcemia → PTH activation → **secondary osteoporosis**
GI system	• Increased appetite • **Peptic ulcers** and gastrointestinal hemorrhage • Possibly pancreatitis [16]
CNS and psyche	• Mood disorders • Cognitive disorders • Psychosis
Eyes	• **Cataract** • Glaucoma

Other	• **Adrenocortical** atrophy
	• Acute adrenal insufficiency (predominantly when glucocorticoids are discontinued suddenly after chronic intake)
	• Avascular bone necrosis [17]
	• Glucocorticoid-induced osteoporosis, osteopenia: chronic glucocorticoid use → **RANKL-mediated** activation of osteoclasts and apoptosis of osteoblasts → decreased bone formation and increased bone resorption [18]
	• **Corticosteroid-induced myopathy** [19]
	  ◦ Acute: generalized muscle weakness
	  ◦ Chronic
	  ▪ Classic form of steroid myopathy
	  ▪ Progressive weakness of proximal **limb muscles**, myalgia
	• Venous thromboembolism
	• Growth inhibition in children
	• **Immunosuppression**
	  ◦ Can result in the reactivation of latent infectious diseases (e.g., CMV, tuberculosis) and opportunistic infections (e.g., candidiasis)
	  ◦ Blood test may show leukocytosis since white blood cells get demarginalized.
	• Specific to anabolic-androgenic steroid abuse
	  ◦ Endocrine/reproductive
	  ▪ Women: e.g., amenorrhea, **hirsutism**, breast atrophy, **deep voice**, androgenic alopecia
	  ▪ Men: e.g., **gynecomastia**, acne, small testes, **low sperm density** (due to inhibition of the hypothalamic-pituitary-gonadal axis)
	  ◦ Cardiovascular: ↑ heart rate, ↑ **blood pressure**
	  ◦ Hematologic: ↑ LDL, ↓ HDL, ↑ **hematocrit**
	  ◦ Neuropsychiatric: e.g., **aggressive behavior**
	  ◦ Tendon ruptures
	  ◦ **Hepatic damage**

Measures to prevent complications

Measures to prevent complications of glucocorticoid therapy

Complication to prevent	Before therapy	During therapy
Adrenal suppression and adrenal insufficiency [3][45]	• Educate patients on sick day rules. • Provide patient with a steroid card/bracelet. • Provide an emergency hydrocortisone kit for injection. [46]	• See "Stress-dose steroids" for information on prevention of adrenal crisis in acute illness, after trauma, or perioperatively.
Osteoporosis [26]	• Assess fracture risk. [26] • Offer bone mineral density testing. • Promote patient education on modifiable risk factors.	• For all patients taking ≥ 2.5 mg/day prednisone (or equivalent) for ≥ 3 months ◦ Optimize bone health ▪ Calcium intake > 1,000–1,200 mg/day ▪ Vitamin D supplementation ▪ Encourage physical activity. ◦ Start pharmacotherapy for glucocorticoid-induced osteoporosis for patients with moderate or high risk for osteoporosis
Peptic ulcer disease [47]	• Screen patients for risk factors for peptic ulcer disease.	• Avoid concurrent NSAID use. • Consider PPIs, e.g., omeprazole in patients with risk factors for peptic ulcer disease.
Diabetes and hyperglycemia [24]	• Obtain baseline HbA1c. [24] • Consider home glucometer for patients on long-term moderate- and high-dose steroids.	• Regularly monitor patients. [33][34][48] • Educate patients on early recognition of the symptoms of diabetes • See "Glucocorticoid-induced hyperglycemia" in "Inpatient management of hyperglycemia"
Infections **Cardiovascular disease** [24]	• Screening ◦ Screen for HIV, hepatitis B, and hepatitis C. [24][35][49][50] ◦ Consider TB screening for patients with risk factors for tuberculosis. [51][52] • Vaccinations: Give missing or indicated vaccinations to patients before initiating therapy planned to last > 14 days. ◦ Live vaccines: ≥ 4 weeks prior to starting therapy, if possible [35][53] ◦ Inactive vaccinations: > 2 weeks prior to starting therapy [54] • Obtain baseline blood pressure measurement and lipid panel.	• Avoid live vaccines during treatment and for at least 1 month after completion. • Routine recommended inactivated vaccines (e.g., influenza) should be given during treatment but may be less effective. • Regular blood pressure measurements to identify arterial hypertension • Regular lipid panels to identify lipid disorders
Ocular disease [24][41][55]	• Screen patients for a history of cataracts or glaucoma.	• Regular eye examinations [42] • Educate patients on the symptoms of glaucoma.
Psychiatric disease [3][24]	• Screen patients for psychiatric comorbidities, e.g., depression. [24]	• Review within a week of initiating steroid therapy for mood changes. [43] • Avoid split-dose regimens to prevent sleep disruption.

Calcium preparations

ORAL

Calcium Gluconate
Calcium citrate
Calcium carbonate–preferred

PARENTERAL

IV calcium Gluconate (preferred)
IV calcium chloride (highly irritant, cause tissue necrosis)

VITAMIN D PREPARATIONS

Ergocalciferol (Vit D2)
Cholecalciferol (Vit D3)
Calcitriol
Alfacalcidiol
Dihydrotachysterol
calcipotriol

Bisphosphonates

Bisphosphonates are pyrophosphate analogs that bind to hydroxyapatite binding sites on the surface of bone tissue: uptake by osteoclasts during phases of bone resorption → interference with osteoclast function and promotion of osteoclast apoptosis → reduced bone resorption

Indications

- Osteoporosis
- Hypercalcemia
- Tumor-induced osteolysis (e.g., metastasis to the bone)
- Multiple myeloma
- Paget's disease of bone
- Hereditary skeletal disorders (e.g., osteogenesis imperfecta)

References: [5]

Contraindications

- Common to all bisphosphonates
  - Hypersensitivity
  - Esophageal abnormalities (e.g., strictures)
  - Inability to stand or sit upright for at least 30 minutes after oral bisphosphonate therapy
- For zoledronic acid
  - Hypocalcemia
  - Reduced creatinine clearance (< 30–35 ml/min/1.73 m2)
- Pregnancy/lactation period: no clear contraindications, individual risks/benefits must be weighed

DOC

Endocrinology

Acromegaly – Octreotide

Addison disease – Hydrocortisone

Congenital adrenal hyperplasia in patient – Hydrocortisone

Anovulation – Clomiphene citrate

PCOS - Clomiphene citrate

BPH – alpha 1a antagonists (Tamsulosin, Silodosin)

Carcinoid syndrome – Somatostatin analogues

GRFoma - Somatostatin analogues

Glucagonoma - Somatostatin analogues

Somatostatinoma - Somatostatin analogues

VIPoma - Somatostatin analogues

Diabetes Insipidus – Desmopressin

Diabetes mellitus type I – Insulin

Gestational diabetes – Insulin

Diabetic ketoacidosis – Insulin

Diabetes mellitus type II treatment – Metformin

Hypercalcemia of malignancy – Bisphosphonates

Hyperprolactinemia – Carbegoline

Hyperthyroidism – Methimazole

Hyperthyroidism in pregnancy –

Ist trimester – Propylthiouracil,

2 nd & 3 rd trimester – Methimazole

DOC

Hypothyroidism – Levothyroxine sodium

Insulinoma – Diazoxide

Oral contraception – Monophasic pills

Oligospermia – Clomiphene citrate

Osteoporosis – Zolendroic acid

Paget's disease - Zolendroic acid

Premature labor – Dexamethasone

Fetal CAH – Dexamethasone

Prolactinoma – Dopamine agonists

Riedel struma – Tamoxifen

Subacute thyroiditis – Aspirin

SIADH – Vaptans (Tolvaptan)

Thyroid storm initial DOC – Propranolol

Thyroid storm overall DOC – Propylthiouracil

Toxic multinodular goitre – Radioiodine

Hyper functioning solitary nodule – Radioiodine

Patho

* Nabothian Cyst (Nabothian Follicle)

It is a mucus filled cyst on the surface of cervix. They are most often caused when stratified squamous epithelium of ectocervix grows over the simple columnar epithelium of endocervix.

Surgery medicine Mobile mass in left hypogastric fossa DDS and treatment and examination. It was ovarian cyst

Right illiac fossa pain DDS examination treatment, investigation

20 ur old diarrhea, vomitwithout mucus and blood, palpitation, brue, tremors

Diagnosis

Tests

Treatmenent

Medicine: scenario hyperthyroidism

Investigations

Treatment

Examination full

: Surgery: upper quadrant pain, investigations and examination

: Differentials for lower abdominal pain... Ureteric colic, ovarian cyst, salphingitis, ect pregnany, appendicitis

Upper right quadrant pain...cholycistitis causes of cholycistitis

Liver Function test Chart

Serum total Bilirubin	3-17 micromole/litter
Alanine aminotransferase (ALT)	up to 42 u/l
Asparatate amino transferase(AST)	up to 37 u/l
Serum Alkaline Phosphatase (ALP)	60-306 u/l
Total Protein	60-80 g/l
Albumin	40-50 g/l
Gamma Glutamyltransferase GGT	11- 60 u/l

LFTs

Liver enzymes	Normal range
Alanine aminotransferase (ALT)	7–55 U / L
Aspartate aminotransferase (AST)	8–48 U / L
Alkaline phosphatase (ALP)	45–115 U / L
Gamma-glutamyl transpeptidase (GGT)	8–61 U / L
5'-nucleotidase	0–15 U / L
Lactate dehydrogenase (LDH)	122–222 U / L

Bilirubin. Direct (Conjugated) and Indirect (Unconjugated)

Histological and physiological features	Early proliferative Days 5-7/28	Mid proliferative phase Days 8-10/28	Late proliferative phase Days 11-14/28	Secretory phase Days >15/28
Thickness	Flat epithelium Thin endometrium	Higher endometrium	Slightly less thick endometrium	Day by day changes (excluded)
Glands : regularly spaced+++	Sparse, narrow, and straight glands	More numerous glands. Beginning of tortuosity	Marked tortuosity of glands	/
Epithelial cells	Cuboid or low columnar cells	Tall columnar cells. No pseudostratification	Pseudostratifi-cation	/
Stroma	Loose stroma of spindle-shaped cells	Interstitial edema	Interstitial edema subsided	/

Diabetes Counselling

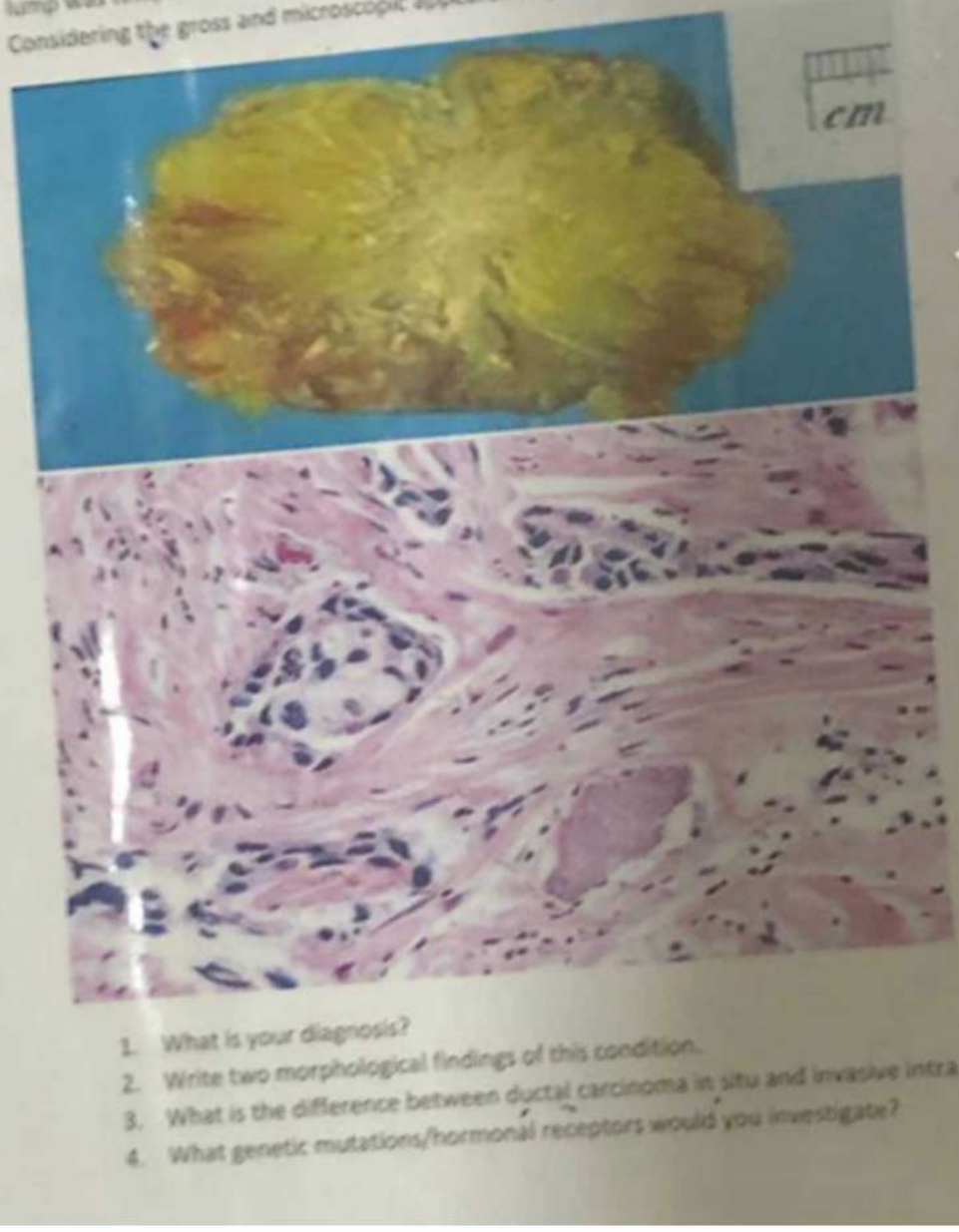
The next step would be to discuss the initial management of type 2 diabetes including:

- 🍛 Dietary advice (e.g. high fibre + low-glycaemic index carbohydrates, low-fat dairy products & oily fish)
- 🍸 Reducing alcohol intake
- ⚖️ Weight loss (if relevant)
- ✍️ Structured education program (e.g. DESMOND)
- 🏃 Regular exercise
- 🩸 HBA1C monitoring every 3-6 months
- 💊 Consideration of drug therapies (e.g. Metformin)
- 💉 Immunisations (influenza & pneumococcal)
- 🏥 Diabetes specialist nurse follow-up

BLOCK L STATIC OSPE STATION

Station no :

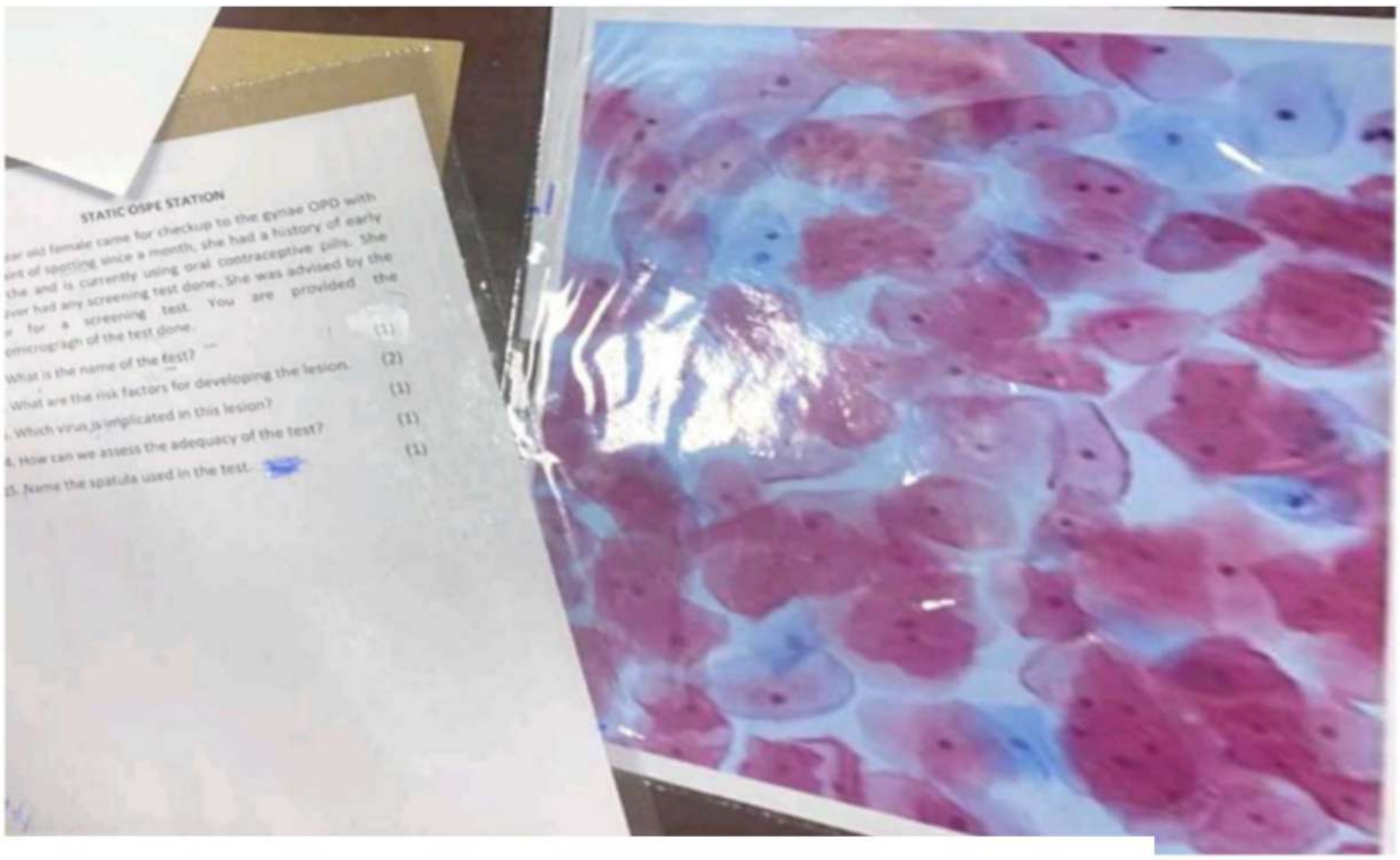
Q; A 57 year old female noticed a lump in her right breast along with skin tethering. On exam
lump was firm, non-tender and fixed .Also the lymph nodes in the axilla on the same side were
Considering the gross and microscopic appearance given, answer the following questions.



1. What is your diagnosis?
2. Write two morphological findings of this condition.
3. What is the difference between ductal carcinoma in situ and invasive intra ductal carcinoma?
4. What genetic mutations/hormonal receptors would you investigate?

A) intra ductal breast carcinoma
B) desmoplastic stroma
Pleomorphic cells arranged in tubular patter
Prominent nucloli with mitosis
C) insitu basement membrance is intact while in the other basement membrane is invaded by cancer cells
D) her 2 neu , brca1 ,brca2

- Whorled pattern of smooth muscles
- Spindle shaped cells
- eosinophilic cytoplasm



1. **Pap smear test**
2. **Risk factors for cervical cancer**

- HPV infection
- Smoking
- Having a weakened immune system
- Oral contraceptives
- Having HIV
- Age
- Diethylstilboestrol
- Obesity
- Sexual active women
- Multiple Sexual partners
- Family history of cervical cancer
- Multiple pregnancies
- sexually transmitted infections (Chlamydia infection)
- Family history

3. **HPV**
4. **Adequacy of pap smear?**
    - **Presence of an Adequate Number of Squamous Cells**
    - **Adequate Endocervical/T-Zone Component**: Presence of **endocervical cells or metaplastic cells from the transformation zone**, indicating the sample was taken from the correct area of the cervix.
    - Proper Fixation and Staining: The sample must be well-fixed and properly stained to avoid obscuring the cells, ensuring accurate assessment.
    - **Absence of Obscuring Factors**: The sample should be **free from blood, mucus, or inflammation** that might obscure the cellular details, although some degree of these is acceptable.
    - **Satisfactory Specimen Volume**: The quantity of cells should be enough to ensure a representative sample, neither too scant nor too dense

    - Pap smear specimen should be obtained 2 weeks after the first day of LMP taken by BRUSHING or SCRAPING
5. **Name the Spatula used AYRES SPATULA**

Ayer's Spatula, Cytobrush, Extended Tip Spatula

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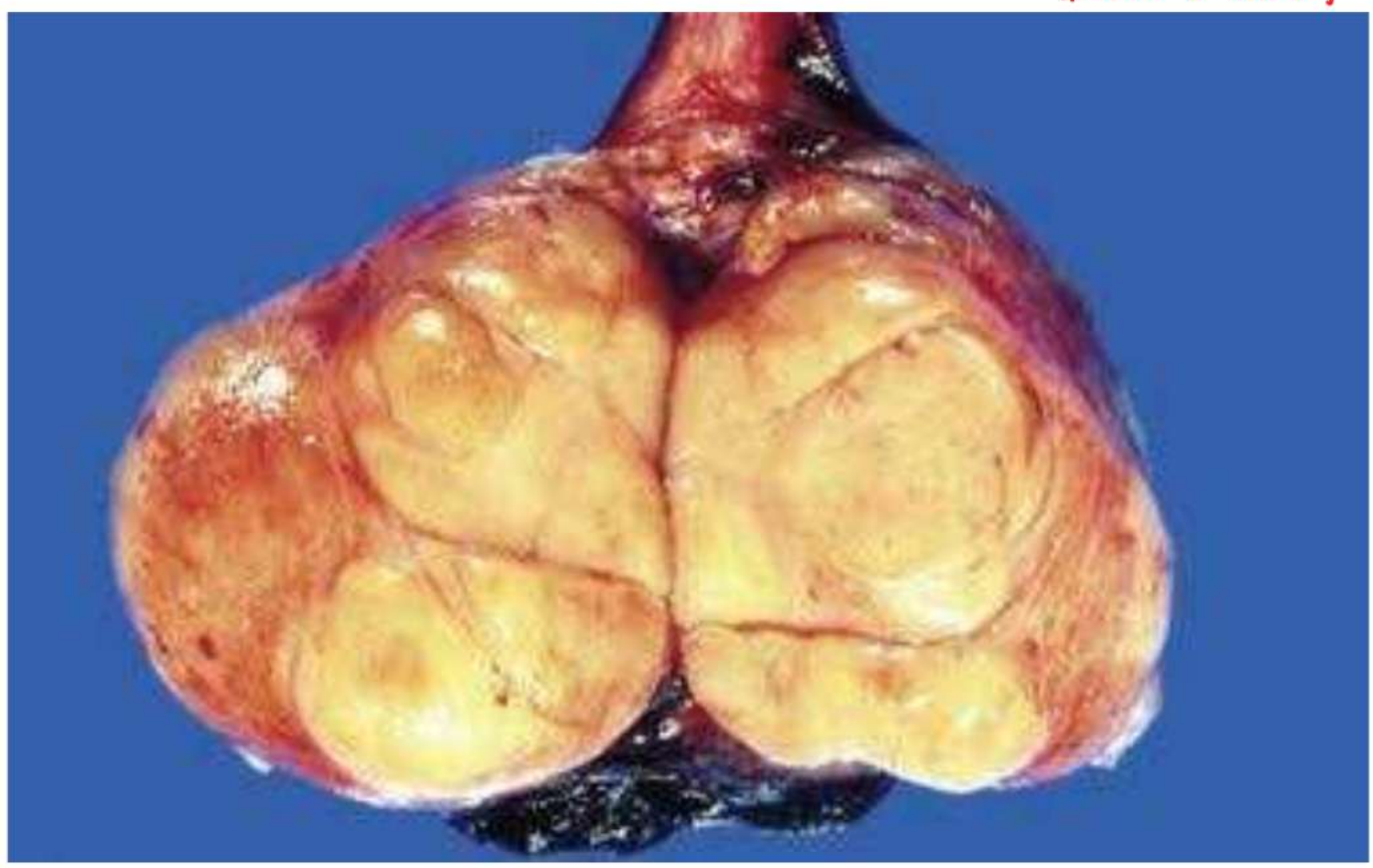
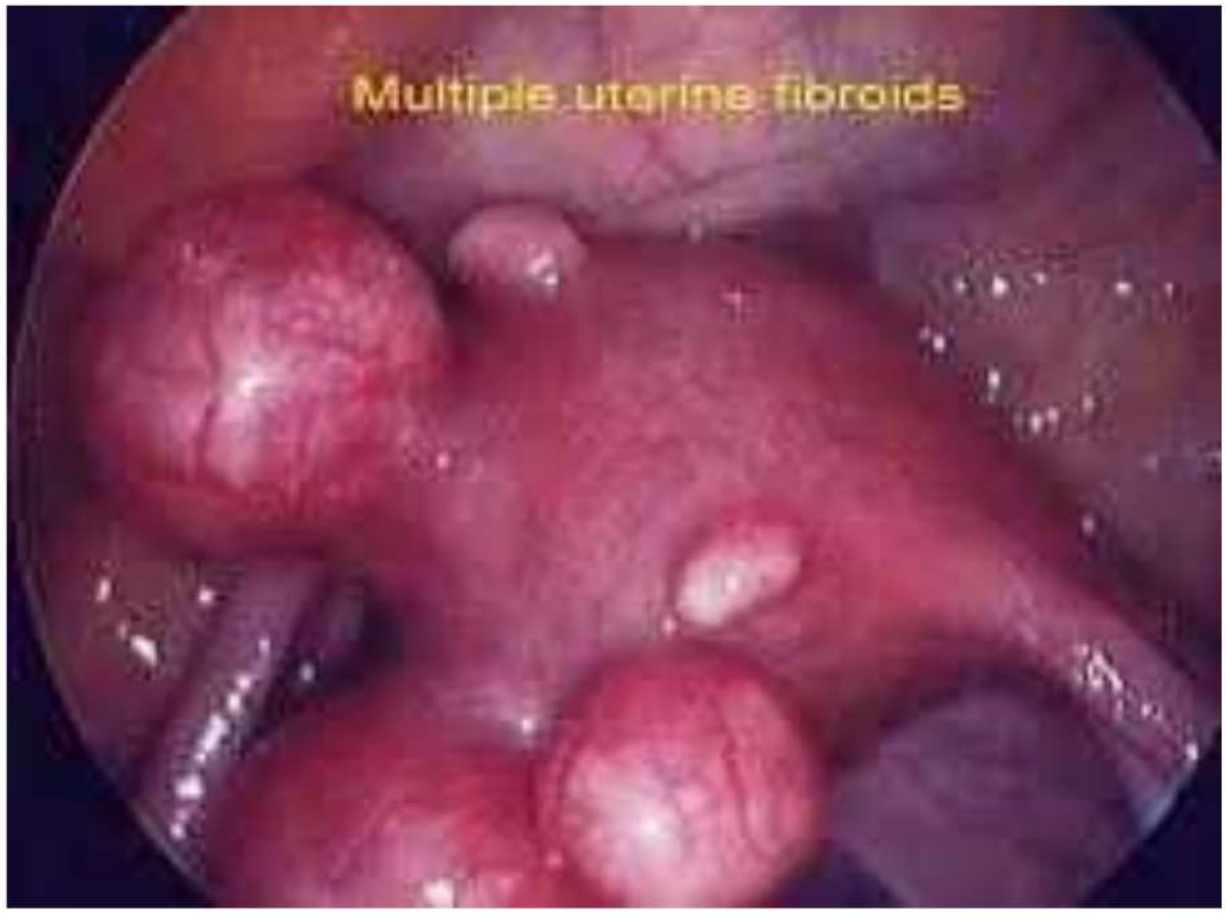


1- Seminoma

Seminoma is a malignant tumor that appears microscopically as sheets of cells with clear cytoplasm, large nuclei, and well-defined cell borders. The cells are often described as having a "fried egg" appearance.

③ Types of Testicular Cancer
- Seminoma
- Non Seminoma

④ Predisposing Factors



Gynae

Uterine Fibroids