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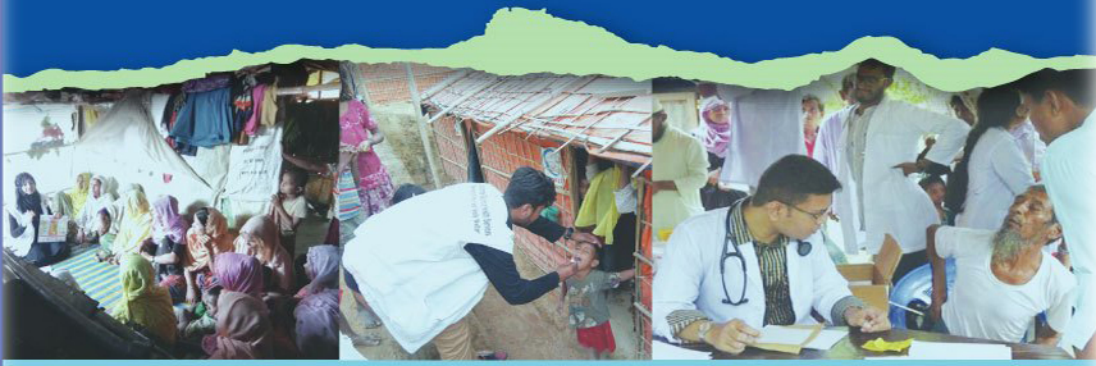

GUIDELINE FOR CASE IDENTIFICATION MANAGEMENT & REPORTING

for

FORCIBLY DISPLACED MYANMAR NATIONALS (FDMNs)

Coordination & Support Center
Directorate General of Health Services
Mohakhali, Dhaka-1212

Government of the People's Republic of Bangladesh

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1st Edition

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Guideline for Case Identification, Management & Reporting for Forcibly Displaced Myanmar Nationals (FDMNs)

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MESSAGE

It is a gratification for me to know that, Coordination & Support Center (CSC) of DGHS is going to publish first edition of *"Guideline for Case Identification, Management & Reporting for Forcibly Displaced Myanmar Nationals (FDMNs)".*

An estimated 688000 FDMNs have crossed over from Myanmar into Bangladesh following an upsurge of violence in North Rakhine State since 25 August 2017. The Government of Bangladesh has been extremely generous and forthcoming in hosting and providing for the FDMNs. Health sector of Bangladesh Government is working for them since their arrival. Including the previous influx, now nearly one million FDMNs are residing in different camps of Cox's Bazar and Bandarban districts. The health needs of this population are continuing to be immense. More than hundred national and international partners of Health Sector responded to the health needs of FDMNs through service delivery in static and mobile health facilities. This guideline will help to maintain an equal and optimum standard of treatment of FDMNs in different health facilities.

Constructive and thoughtful suggestions and advices are appreciated from the users of this guideline which will help us to improve both quality and contents in future. I am thankful to those who contributed for preparing this guideline and also those who are working continuously for improvement of health status of FDMNs.

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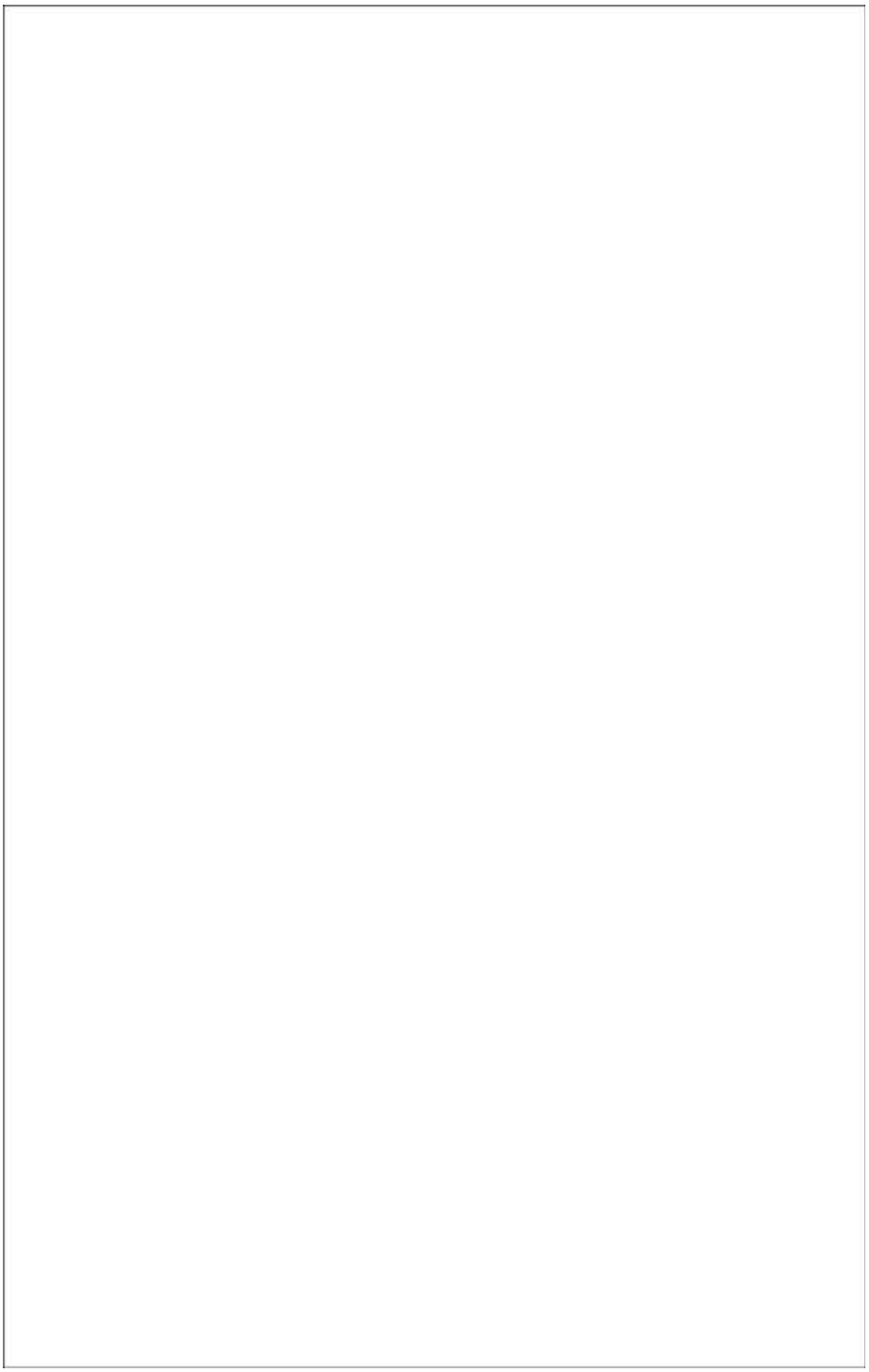

PREFACE

The violence in Rakhine State of Myanmar has triggered a massive and swift influx of Myanmar nationals across the border in Cox's Bazar (Ukhia, Teknaf and Ramu) and Bandarban districts. As Bangladesh has given shelter to the Forcibly Displaced Myanmar Nationals (FDMNs), it is our professional and humanitarian duty to serve them with utmost dignity and respect. Therefore, considering their helplessness and statelessness, it is required to interact with FDMN patients with care and empathy. The increasing number of population in these areas, including both FDMN and host communities demand health care and services. Access to health care for such a huge population, is a common problem. Over 100 partners are working there and quality of care provided is highly variable. So there is a need for a common protocol for clinical management to maintain optimum standard of the health service provided with minimum resources. Considering this necessity, Coordination & Support Center (CSC) of DGHS prepared *"Guideline for Case Identification, Management & Reporting for Forcibly Displaced Myanmar Nationals (FDMNs)"* as per assignment of Director General of Health Services. The list of health problems and diseases in this guideline selected on the basis of frequency of cases visited at health centers for FDMN. These are reported daily to DGHS from the health centers. Due to lack of adequate investigation facilities, emphasis is given on clinical sign symptoms and symptomatic management of cases. Several national guidelines of Bangladesh & international guidelines, medical textbooks, journals and recommendations from distinguished physicians were used as reference to prepare this guideline. Any constructive criticism and advice are appreciated.

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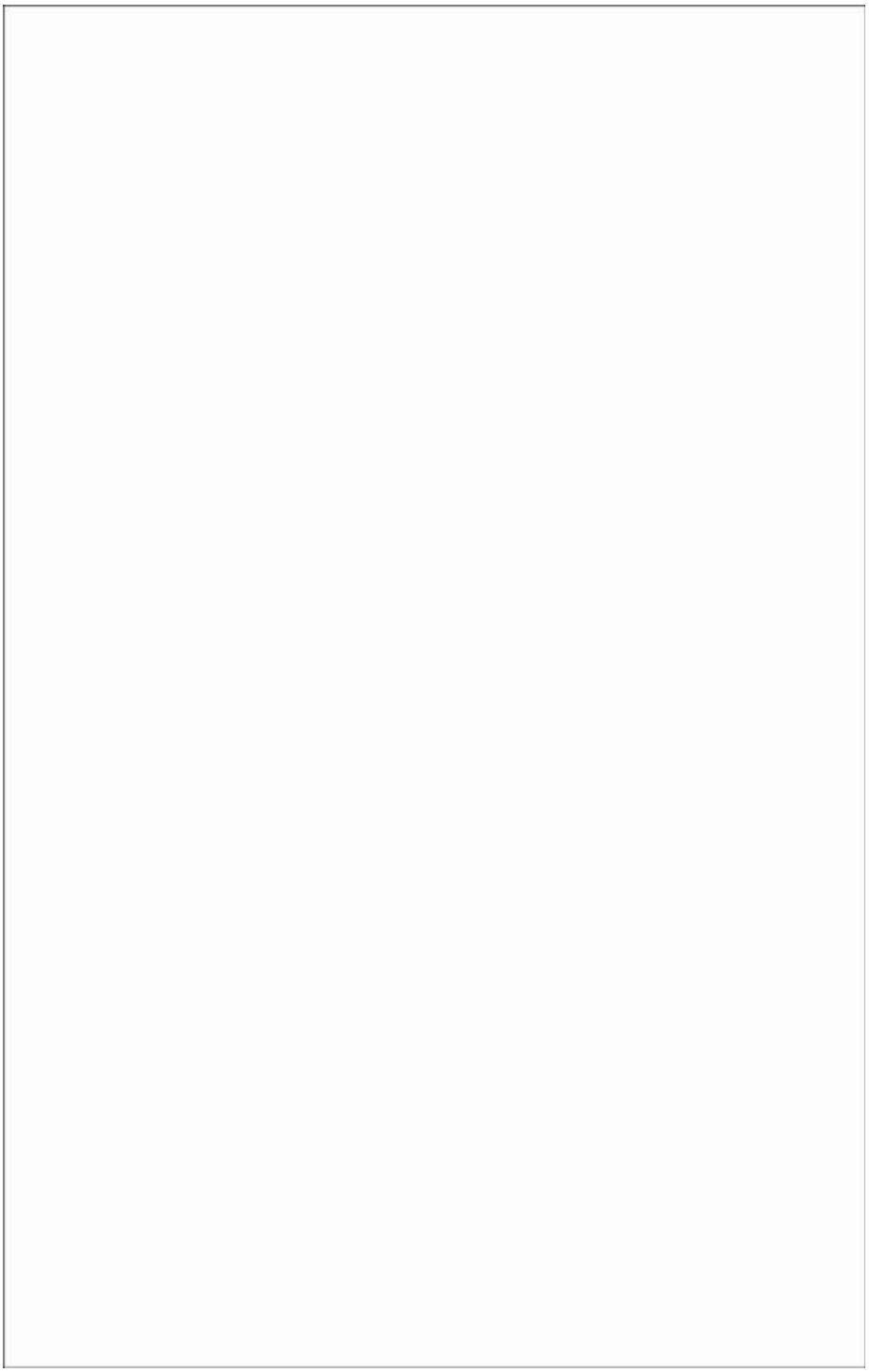


ACRONYMS

ACT	: Artemisinin-based Combination Therapy
ART	: Antiretroviral Therapy
BiPAP	: Bi-level Positive Airway Pressure
BSE	: Blood Slide Examination
CAP	: Community Acquired Pneumonia
CBT	: Cognitive Behavioural Therapy
CPAP	: Continuous Positive Airway Pressure
CSF	: Cerebrospinal Fluid
CT	: Computed Tomography
DBP	: Diastolic Blood Pressure
DEET	: N,N-Diethyl-meta-toluamide
DGHS	: Directorate General of Health Services
DOTS	: Directly Observed Treatment, Short-course
DSM-5	: The Diagnostic and Statistical Manual of Mental Disorders, 5th Edition
DT	: Diphtheria and Tetanus toxoids vaccine (for children less than 7 years old)
EWARN	: Early Warning Alert and Response Network
FDC	: Fixed-Dose Combination
FDMN	: Forcibly Displaced Myanmar National
HONK	: Hyperglycaemic Hyperosmolar Nonketotic Coma
IU	: International Unit
LASIK	: Laser In-Situ Keratomileusis
LDH	: Lactate Dehydrogenase
LNS	: Lipid-based Nutrient Supplement
LSD	: Lysergic Acid Diethylamide
MDMA	: 3,4-Methylenedioxy-methamphetamine
MIC	: Minimum Inhibitory Concentration
MIU	: Million International Units
MR	: Measles-Rubella (Vaccine)
MTB/RIF	: Mycobacterium tuberculosis/ Resistance to Rifampicin
MUAC	: Mid-Upper Arm Circumference
NCHS	: National Center for Health Statistics
NSAIDs	: Nonsteroidal Anti-Inflammatory Drugs
OHA	: Oral Hypoglycaemic Agent
OTC	: Over The Counter
PAD	: Peripheral Artery Disease
PCR	: Polymerase Chain Reaction
PDD-NOS	: Pervasive Developmental Disorder Not Otherwise Specified

PTSD	: Post-Traumatic Stress Disorder
PUVA	: Psoralen and Ultraviolet A
RDT	: Rapid Diagnostic Test
ReSoMal	: Rehydration Solution for Malnutrition
SAH	: Sub Arachnoid Heamorrhage
SARA	: Sexually Acquired Reactive Arthropathy
SBP	: Systolic Blood Pressure
SFP	: Supplementary Feeding Program
SLE	: Systemic Lupus Erythematosus
SLT	: Smokeless Tobacco
Td	: Diphtheria and Tetanus toxoids vaccine (for those who are at least 7 years or more)
TFT	: Thyroid Function Test
TOD	: Target Organ Damage
UHC	: Upazila Health Complex
VCT	: Voluntary Counseling and Testing
VHF	: Viral Haemorrhagic Fever
WASH	: Water, Sanitation and Hygiene
WHM	: Weight-for-Height Median
WHO	: World Health Organization
WHZ	: Weight-for-Height Z-score
WRD	: WHO approved Rapid Diagnostic Tool

DEFINITIONS

FDMNs

Forcibly Displaced Myanmar Nationals are an ethnic minority group (also known as Rohingya), the majority of whom are Muslim, Indo-Aryan-speaking people who have lived for centuries in Rakhine State of Buddhist majority country Myanmar and time to time forced to fled the country by the military's large-scale campaign of ethnic cleansing.

Suspected case

A suspected case is a case that meets clinical case definition; meaning the signs and symptoms a person has or presents with are consistent or compatible with a particular disease. The suspected case definition is often used for reporting purposes, so a case is reported to public health authorities for further investigation.

Probable case

A probable case is a case that meets clinical case definition and has supportive or presumptive laboratory results that are consistent with the diagnosis, yet do not meet the criteria for laboratory confirmation.

Confirmed case

A confirmed case is a case that can either be laboratory confirmed or epidemiologically linked with a laboratory confirmed case.

Syndromic case

A syndromic case is a case in which clinical signs and symptoms are due to various or multiple causative organisms, where demonstration of aetiological agent is irrelevant for adequate case management or public health action.

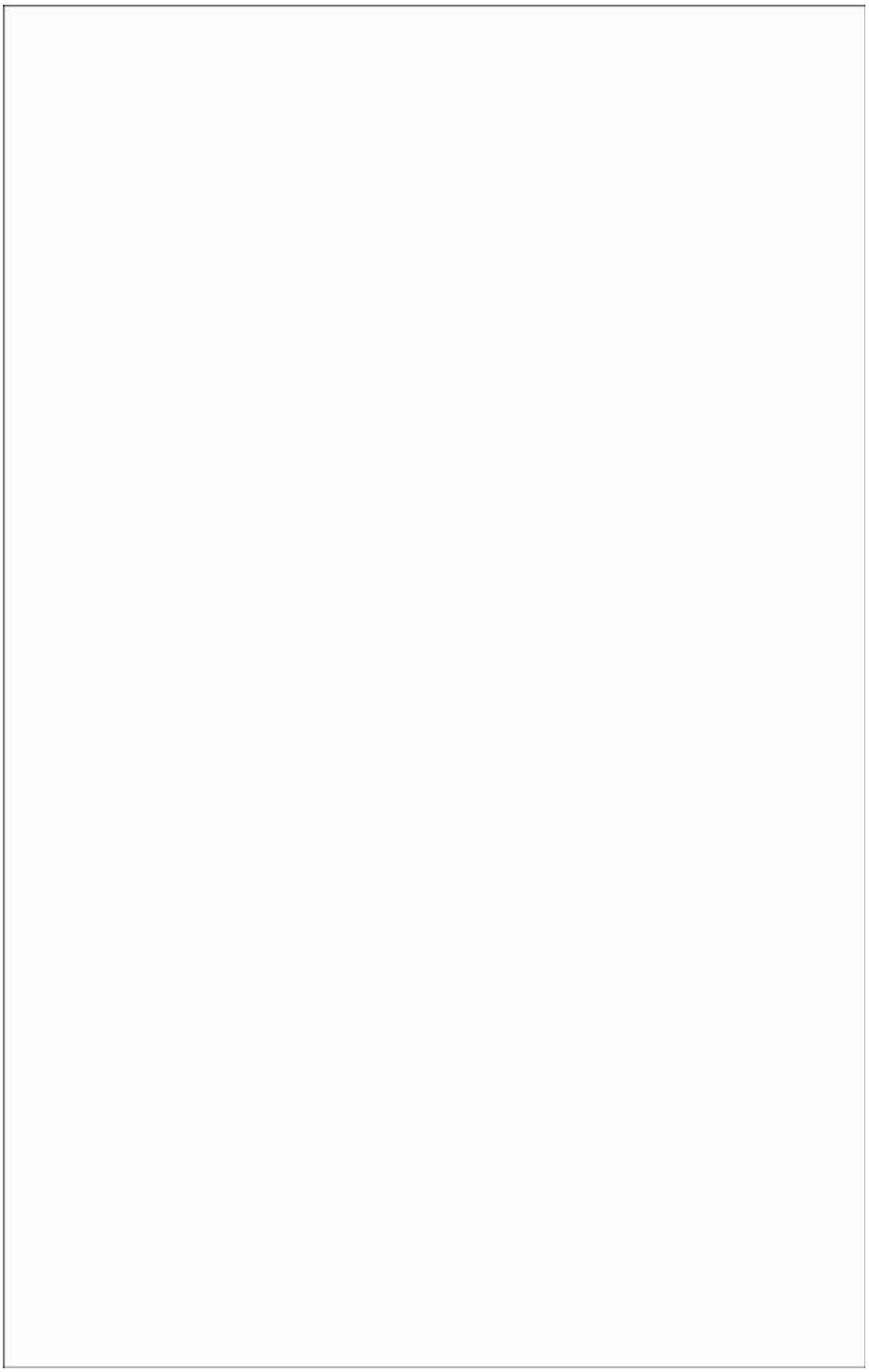
Laboratory confirmed

A confirmed case is laboratory confirmed if the patient's clinical specimen meets the diagnostic criteria of a specified laboratory method. Clinical specimens are often forwarded to a reference laboratory for ascertainment or confirmation of laboratory results.

Epidemiologically linked

A confirmed case is a case in which:

a) The patient has had contact with one or more persons who either have/had the disease or have been exposed to a point source of infection
b) Transmission of the disease-causing pathogen by the usual modes of transmission are plausible.



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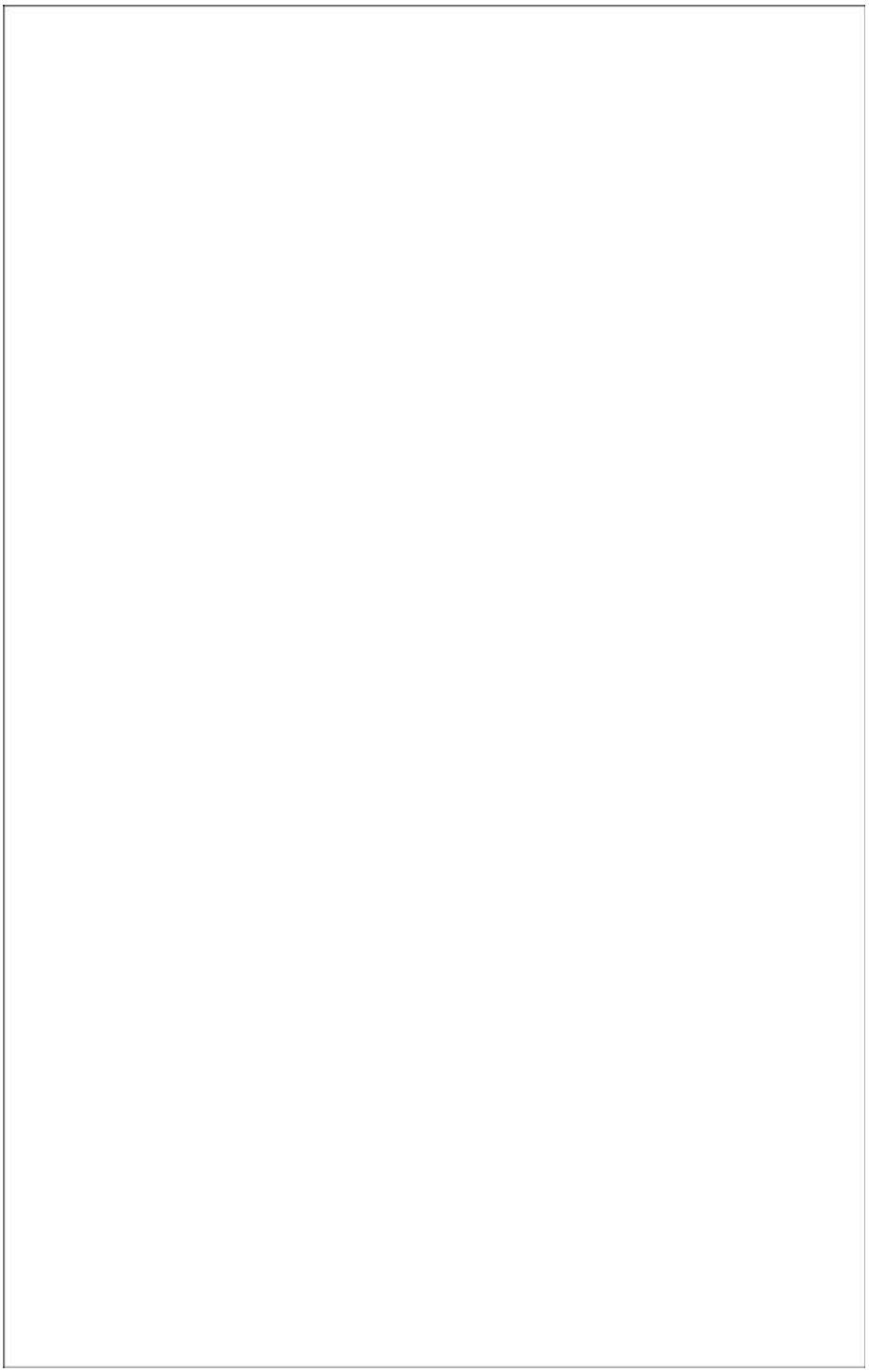


ABSCESS

1

Definition

An abscess is an enclosed collection of liquefied tissue, known as pus, somewhere in the body. It is the result of the body's defensive reaction to foreign material. It is the last stage of a tissue infection that begins with a process called inflammation.

- There are two types of abscesses, septic and sterile.
    - o Most abscesses are septic, which means that they are the result of an infection. Septic abscesses can occur anywhere in the body.
    - o Sterile abscesses are sometimes a milder form of the same process which are not caused by germs but by nonliving irritants such as drugs.

Signs & symptoms

- The common findings of inflammation- heat, redness, swelling and pain- easily identify superficial abscesses
- Abscesses in other places may produce only generalized symptoms such as fever and discomfort
- Recent or chronic disease in an organ suggests it may be the site of an abscess
- Dysfunction of an organ or system- for instance, seizures or altered bowel function or cough with foul smelling sputum often mixed with blood or intense right upper abdominal pain with nausea, weight loss, fever- may provide the clue
- **Pain** and **tenderness** on **physical examination** are common findings
- Sometimes a deep abscess will eat a small channel (sinus) to the surface and begin leaking pus
- A sterile abscess may cause only a painful lump (usually deep in the buttock or other area) caused by irritants, such as foreign bodies, injected intramuscular drugs and medications that have not been totally absorbed.

Diagnosis

- **Clinical evaluation-** Diagnosis of cutaneous and subcutaneous abscesses is by physical examination
- **Sometimes ultrasonography, CT Scan or MRI-** Diagnosis of deep abscesses often requires imaging. Ultrasonography is noninvasive and detects many soft-tissue abscesses; CT is accurate for most, although MRI is usually more sensitive in case of abscesses involving organs such as brain, liver, lungs etc.

Treatment

The main treatment options include:

1. Antibiotics based on clinical assumption
    - Superficial abscesses may resolve with heat and oral antibiotics
    - Systemic antimicrobial drugs are indicated as adjunctive therapy as follows:
        - ✓ If the abscess is deep (eg, intra-abdominal)
        - ✓ If abscesses are multiple
        - ✓ If there is significant surrounding cellulitis
        - ✓ Perhaps if size is > 2 cm
    - Antimicrobial drugs are usually ineffective without drainage. Empiric antimicrobial therapy is based on location and likely infecting pathogen. Gram stain, culture and susceptibility results guide further antimicrobial therapy.
2. A drainage procedure
    - Minor cutaneous abscesses may require only incision and drainage. Predisposing conditions, such as obstruction of natural drainage or the presence of a foreign body, require correction.
    - Deep abscesses can sometimes be adequately drained by percutaneous needle aspiration (typically guided by ultrasonography or CT); this method often avoids the need for open surgical drainage.
3. Surgery

Complications of abscesses include

- Bacteremic spread
- Rupture into adjacent tissue
- Bleeding from vessels eroded by inflammation
- Impaired function of a vital organ
- Inanition (weakness) due to anorexia and increased metabolic needs.

ARI (ACUTE RESPIRATORY INFECTION) 2

Definition

Acute respiratory infection (ARI), also known as Influenza-like illness (ILI) and flu-like syndrome/symptoms, is a medical diagnosis of possible influenza or other illness causing a set of common symptoms.

Flu symptoms

Influenza (also known as the flu) is a contagious respiratory illness caused by flu viruses. It can cause mild to severe illness and at times can lead to death. The flu is different from a cold. The flu usually comes on suddenly. People who have the flu often feel some or all of these symptoms:

- Fever* or feeling feverish/chills
- Cough
- Sore throat
- Runny or stuffy nose
- Muscle or body aches
- Headaches
- Fatigue (tiredness)
- Some people may have vomiting and diarrhoea, though this is more common in children than adults.

** It is important to note that not everyone with flu will have a fever.*

People at high risk from flu

Anyone can get the flu (even healthy people). People who are at high risk of developing serious flu-related complications if they get sick include:

- People aged 65 years and older
- People of any age with certain chronic medical conditions (such as asthma, diabetes or heart disease)
- Pregnant women
- Under five and young children.

Table- 2.1 : Emergency warning signs of flu sickness

In children	In adults
• Fast breathing or trouble breathing • Bluish skin colour • Not drinking enough fluids • Not waking up or not interacting • Being so irritable that the child does not want to be held • Flu-like symptoms improve but then return with fever and worse cough • Fever with a rash	• Difficulty in breathing or shortness of breath • Pain or pressure in the chest or abdomen • Sudden dizziness • Confusion • Severe or persistent vomiting • Flu-like symptoms that improve but then return with fever and worse cough

In addition to previously mentioned signs, get medical help right away for any infant who has any of these signs:

- Being unable to eat
- Has trouble breathing
- Has no tears when crying
- Significantly fewer wet diapers than normal

Diagnosis

The diagnosis depends on

a) The review of symptoms

b) Physical examination- focusing on breathing of the patient, the physician will check for inflammation and fluid in the lungs. They usually do it by listening to the abnormal sounds made when the patient breathe. They will check throat, nose and ear of the patient as well.

c) Laboratory tests- chest x-ray

Treatment

- With many viruses, there are no known treatment.
- ARIs are mostly treated for relief of symptoms. Some people get benefit from the use of cough suppressants, expectorants, vitamin C and zinc to reduce symptoms or shorten the duration.
- Other treatments include:
  - ✓ **Nasal decongestants** can improve breathing. But the treatment may be less effective with repeated use and can cause rebound nasal congestion
  - ✓ **Steam inhalation** and gargling with salt water
  - ✓ **Analgesics** like acetaminophen and NSAIDs can help reduce fever, aches and pains
- If physician suspects a bacterial infection, they may prescribe antibiotics based on clinical assumption.

Preventing acute respiratory infection

- Most causes of an acute respiratory infections are not treatable. Therefore, prevention is the best method against harmful respiratory infections. Getting the **MMR** (measles, mumps and rubella) and **pertussis**, **influenza** and **pneumococcal** vaccine will substantially lower risk of getting a respiratory infection.
- Avoid smoking and make ensure plenty of vitamins in diet, such as vitamin C, which helps to boost immune system.
- Practice good hygiene:
  - ✓ Frequent hand washing
  - ✓ Always sneeze into the arm of shirt or in a tissue
  - ✓ Avoid touching face, especially eyes and mouth.

Flu complications

Most people who get influenza will recover in a few days to less than two weeks, but some people will develop complications such as:

- Pneumonia, bronchitis, sinus and ear infections are complications from flu
- Pneumonia as a result of the flu, can be life-threatening and result in death
- The flu can make chronic health problems worse. For example, people with asthma, chronic congestive heart failure may experience worsening of this condition that is triggered by the flu.

- Influenza and other respiratory viruses circulate between spring and autumn in temperate climates and all year in tropical climates. These viruses cause symptoms often referred to as influenza-like illness (ILI), but are not generally distinguishable on clinical grounds alone.
- Technically, any clinical diagnosis of influenza is a diagnosis of ILI, not of influenza. This distinction usually is of no great concern because, regardless of cause, most cases of ILI are mild and self-limiting.
- In addition to influenza, viruses known to cause ILI include respiratory syncytial virus, rhinovirus, adenovirus, parainfluenza viruses, human coronaviruses and the recently recognized human metapneumovirus.
- Influenza, RSV and certain bacterial infections are particularly important causes of ILI because these infections can lead to serious complications (severe acute respiratory syndrome/ SARS) requiring hospitalization.
- Less common causes of ILI include bacteria such as *Legionella, Chlamydia pneumoniae, Mycoplasma pneumoniae* and *Streptococcus pneumoniae.*

3 ASCARIASIS/ HELMINTHIASIS

Definition

Helminthiasis

- Infection of the human body with a parasitic worm such as roundworms and pinworms
- The worms usually only involve the intestinal tract but sometimes they may invade other organs
- The type and severity of symptoms are determined by the type of worm and the part of the body infected

Symptoms of Helminthiasis

Helminthiasis patient may be **asymptomatic;** other signs and symptoms of *Helminthiasis* are listed in table 3.1.

Table- 3.1 : Symptoms of Heltminthiasis

1. Abdominal pain	9. Gastrointestinal inflammation	15. Skin symptoms	22. Eye symptoms
2. Diarrhoea	10. Malabsorption	16. Chest pain	23. Malaise
3. Fever	11. Bowel obstruction	17. Vomiting	24. Headache
4. Fatigue	12. Anaemia	18. Constipation	25. Itchy anus
5. Enlarged liver	13. Dehydration	19. Weight loss	26. Neurological problems
6. Enlarged spleen	14. Bloody diarrhoea	20. Distended abdomen	27. Irritability
7. Cough		21. Itchy skin	
8. Eosinophilia			

Ascariasis

Definition

- An infection of the small intestine caused by *Ascaris lumbricoides (A. lumbricoides),* which is a species of roundworm
- Ascariasis is most common in places without modern sanitation. People get it through unsafe food and water. The infection usually causes no symptoms, but higher numbers of roundworms (heavier infestations) can lead to problems in the lungs or intestines.

Table- 3.2 : Symptoms of Ascariasis

1) Usually asymptomatic, but noticeable when the roundworm infestation grows. **2)** Roundworms in intestines can cause- • Nausea • Vomiting • Irregular stools or diarrhoea • Loss of appetite	• Intestinal blockage, which causes severe pain and vomiting • Visible worms in the stool • Abdominal discomfort or pain • Weight loss • Growth impairment in children due to malabsorption

3) Roundworms in the lungs can cause: • Coughing or gagging • Wheezing or shortness of breath • Aspiration pneumonia, rarely • Blood in mucus • Chest discomfort • Fever	**4)** Large infestations can cause/ have other symptoms, such as • Fatigue and fever • Extreme discomfort **One may have all or many of the above symptoms if do not receive prompt treatment.*

Diagnosis

- Examining a **stool sample** for **parasites and ova** (eggs)
- Blood tests- elevated eosinophils count
- May need more tests, such as one of these imaging tests
  - ✓ X-ray
  - ✓ CT scan
  - ✓ Ultrasound
  - ✓ MRI scan
  - ✓ Endoscopy

Treatments

- Medication most commonly used include: **Albendazole**
  Dosage of Albendazole-
  12 months – 2 years: 200 mg orally single dose
  > 2 years: 400 mg orally single dose
  * Not recommended for children under 12 months
  * Repeat the dose after 7-14 days
- In advanced cases, surgery may be recommended-
  1. To control a larger infestation and
  2. If the roundworms are completely blocking intestines.

Risk factors

- ✓ The roundworm is found worldwide. It is more common in areas where sanitation is poor.
- ✓ Environmental risk factors for ascariasis include:
  - Lack of modern hygiene and sanitation infrastructure
  - Use of human faeces for fertilizer
  - Living in or visiting a warm climate
  - Exposure to an environment where dirt might be ingested
- ✓ Exposure to roundworms can be limited by avoiding unsafe food and water. Keeping immediate environment clean also helps. This includes laundering clothing exposed to unsanitary conditions and cleaning cooking surfaces well.

- ✓ Making sure to take precautions if one visiting a remote area.
  It is important to:
  - Always wash hands with soap and water before eating or preparing food
  - Boil or filter drinking water
  - Inspect food preparation facilities
  - Avoid unclean common areas for bathing
  - Peel or cook unwashed vegetables and fruit in regions that lack sanitation infrastructure or that use human faeces for fertilizer
- ✓ Children who are 3 to 8 years old are most likely to be infected because of their contact with soil while playing.

Complications of Ascariasis

Most cases of ascariasis are mild and do not cause major problems. However, heavy infestations can spread to other parts of the body and lead to dangerous complications. They can include:

- Bowel obstruction
- Pancreatitis
- Cholecystitis
- Peritonitis (inflammation of the abdominal cavity lining)
- Intussusception (an intestinal condition in which part of the intestine is pulled into itself, creating an obstruction)
- Volvulus (abnormal twisting of the intestine)
- Peritoneal granulomas (scar tissue lining the abdomen)
- Hepatic abscesses
- Pneumonitis (inflammation of the lungs).

COPD

4

Definition

- Chronic obstructive pulmonary disease or COPD, is a group of progressive lung diseases. It is chronic, slowly progressive disease of airflow limitation. The most common are emphysema and chronic bronchitis. Many people with COPD have both of these conditions.
- Emphysema slowly destroys air sacs in lungs, which interferes with outward air flow. Bronchitis causes inflammation and narrowing of the bronchial tubes, which allows mucus to build up.

Diagnosing COPD

COPD is diagnosed clinically and by spirometry. It is not fully reversible like asthma.

- COPD makes it harder to breathe. Symptoms may be mild at first, beginning with coughing and shortness of breath. As it progresses, it can become increasingly difficult to breathe
- Some may experience wheezing and tightness in the chest
- Some people with COPD have exacerbations or flare-ups of severe symptoms
- The top cause of COPD is smoking. Long-term exposure to chemical irritants can also lead to COPD. It is a disease that takes a long time to develop.

There is no single test for COPD. Diagnosis is based on history, symptoms physical examination and test results.

A. History includes

- Smoking history or history of smoking in the past
- Exposure to a lot of secondhand smoke
- Exposure to lung irritants on the job
- Cough (chronic, productive)
- Dyspnoea
- Wheezing
- Acute chest illnesses: frequencies, productive cough, fever
- Family history of COPD
- History of asthma or other respiratory conditions
- Drug history

B. Symptoms of COPD

1) At first, symptoms of COPD can be quite mild. One might be inclined to dismiss them as a cold

2) Early symptoms include:
   - Occasional shortness of breath, especially after exercise
   - Mild but recurrent cough
   - Need of clearing throat often, especially first thing in the morning
3) One might start making subtle changes, such as avoiding stairs and skipping physical activities
4) Symptoms can get progressively worse and harder to ignore. As the lungs become more damaged, the patient may experience:
   - Shortness of breath, after even mild exercise such as walking up a flight of stairs
   - Wheezing or noisy breathing
   - Chest tightness
   - Chronic cough with or without mucus
   - Need to clear mucus from lungs every day
   - Frequent colds, flu or other respiratory infections
   - Lack of energy
5) In later stages of COPD, symptoms may also include:
   - Fatigue
   - Swelling of the feet, ankles, or legs
   - Weight loss

C. Physical examination

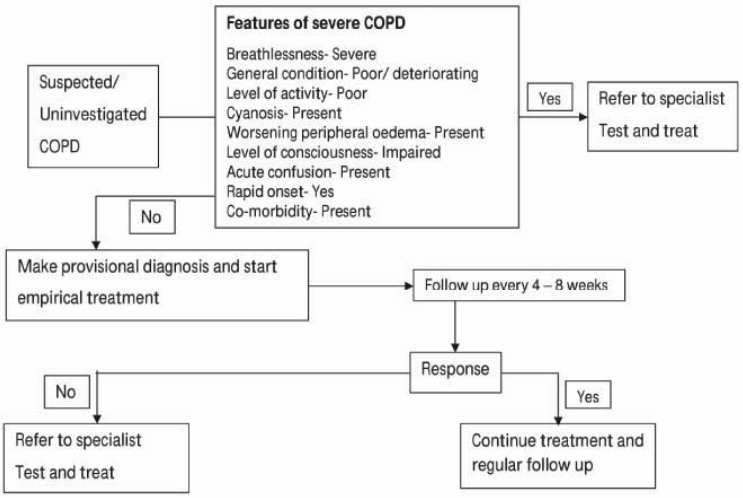
1) The sensitivity of physical examination in detecting mild to moderate COPD is relatively poor, but physical signs are quite specific and sensitive for severe disease. Findings in severe disease include the following:
   - Tachypnoea and respiratory distress with simple activities
   - Pursed lip breathing
   - Use of accessory respiratory muscles and paradoxical indrawing of lower intercostal spaces (**Hoover sign**)
   - Cyanosis
   - Elevated jugular venous pulse (JVP)
   - Peripheral oedema
2) Thoracic examination reveals the following:
   - Hyperinflation (barrel chest)
   - Wheezing– frequently heard on forced and unforced expiration
   - Diffusely decreased breath and heart sounds
   - Hyper resonance on percussion
   - Breath sound: vesicular with prolonged expiration
   - Coarse crackles beginning with inspiration in some cases

D. Some of these tests may be suggested to get a more complete picture

- A **spirometry** is a noninvasive test to assess lung function
- **Imaging tests** include a chest x-ray or CT scan
- An **arterial blood gas** test involves taking a blood sample from an artery to measure blood oxygen levels

These tests can determine if the patient has COPD or perhaps some other condition, such as asthma or heart failure.

Figure- 4.1 : Management algorithm for COPD



Immediate medical care is needed if the patient

- Has bluish or grey fingernails or lips, as this indicates low oxygen levels in blood
- Has trouble catching breath or cannot talk
- Feel confused, muddled or faint
- Heart is racing

Symptoms are likely to be much worse if the patient currently smokes or is regularly exposed to smoke

- The goals of treatment for COPD are to-
  - **Slow down the disease** by quitting smoking and avoiding triggers, such as air pollution
  - **Limiting symptoms**, such as shortness of breath with medicines
  - **Improvement of overall health status** with regular activity
  - **Prevent and treat flare-ups** with medicines and other treatment
- **Medicine for COPD is used to-**
  - Reduce shortness of breath
  - Control coughing and wheezing
  - Prevent COPD flare-ups, also called exacerbations or keep the flare-ups the patient have from being life-threatening.

Treatment

- **Medications**

Several kinds of medications are used to treat the symptoms and complications of COPD. Some medications on a regular basis and others as needed.

1) **Bronchodilators-** These medications- usually come in an inhaler. Depending on the severity of the disease, one may need a short-acting bronchodilator before activities, a long-acting bronchodilator that the patient uses every day or both.
2) **Inhaled steroids-** Inhaled corticosteroid medications can reduce airway inflammation and help by preventing exacerbations. These medications are useful for people with frequent exacerbations of COPD.
3) **Combination inhalers-** Some medications combine bronchodilators and inhaled steroids. Salmeterol and fluticasone; or formoterol and budesonide are examples of combination inhalers.
4) **Oral steroids-** For people who have a moderate or severe acute exacerbation, short courses (for example, five days) of oral corticosteroids prevent further worsening of COPD.
5) **Phosphodiesterase-4 inhibitors-** A new type of medication approved for people with severe COPD and symptoms of chronic bronchitis is **roflumilast** a phosphodiesterase-4 inhibitor.
6) **Theophylline**- This very inexpensive medication may help by improving breathing and preventing exacerbations. Side effects include nausea, headache, fast heartbeat and tremor. Side effects are dose related and low doses are recommended.

7) **Antibiotics- (based on clinical assumption)-** Respiratory infections, such as acute bronchitis, pneumonia and influenza can aggravate COPD symptoms. Antibiotics help treating acute exacerbations, but they are not generally recommended for prevention.

- **Lung therapies**

  Doctors often use these additional therapies for people with moderate or severe COPD:

  - Oxygen therapy- oxygen at no more than 28% (via venturi mask, 4 L/minute) or no more than 2 L/minute (via nasal prongs) and aim for oxygen saturation 88-92% for patients with a history of COPD until arterial blood gases (ABGs) have been checked
  - Pulmonary rehabilitation program.

- **Managing exacerbations**

  - Even with ongoing treatment, one may experience times when symptoms become worse for days or weeks. This is called an acute exacerbation and it may lead to lung failure if prompt treatment is not received.
  - Exacerbations may be caused by a respiratory infection, air pollution or other triggers of inflammation.
  - When exacerbations occur, the patient may need additional medications (such as antibiotics, steroids or both), supplemental oxygen or treatment in the hospital.
  - Once symptoms improve, the patient should be advised about measures to prevent future exacerbations, such as quitting smoking, taking inhaled steroids, long-acting bronchodilators or other medications, getting flu vaccine and avoiding air pollution whenever possible.

- **Surgery**

  Surgery is an option for some people with some forms of severe emphysema who are not helped sufficiently by medications alone. Surgical options include:

  - Lung volume reduction surgery
  - Lung transplant
  - Bullectomy

- **Lifestyle modification and home remedies** for a patient with COPD to feel better and slow the damage to his/ her lungs

  - Control of breathing
  - Clearing airways
  - Regular physical exercise
  - Eating healthy foods
  - Avoiding smoking and air pollution
  - Visiting doctor regularly.

5 COUGH & COLD: NO PNEUMONIA

Definition

A child with cough or difficult breathing who has no general danger signs, no chest indrawing, no stridor when calm and no fast breathing is classified as having no pneumonia: cough or cold.

General danger signs

- Not able to drink or breast feed
- Vomits everything
- Convulsion
- Lethargic or unconscious

Fast breathing

- Less than 2 months- 60 breaths per minute or more
- 2 months to 12 months- 50 breaths per minute or more
- 12 months to 5 years- 40 breaths per minute or more

- A child with no pneumonia: cough or cold does not need an antibiotic. Antibiotic will not relieve the symptoms or will not prevent developing pneumonia. Instead the mother should be advised about good home care.
- It normally improves in one to two weeks. If a child has chronic cough (a cough lasting more than 30 days) may have tuberculosis, asthma, whooping cough or another problem. Thus a child with chronic cough needs to be referred to hospital for further assessment.
- Tuberculosis should be suspected if anyone in the family has the disease or if the child is malnourished, has a swelling in the neck or under the arm or has continuing fevers. Children with suspected tuberculosis should be referred for a chest x-ray and assessment by a qualified physician.

Management

1. Advise mother to give the following home care

a) Less than 2 months

- Keep young infant warm
- Breast-feed frequently
- Clear nose if it interferes with feeding

- Return quickly if-
  - ✓ Breathing becomes difficult
  - ✓ Breathing becomes fast
  - ✓ Feeding becomes a problem
  - ✓ The young infant becomes sicker

b) 2 months to 5 years

- Feed the child
  - ✓ Feed the child during illness
  - ✓ Increase feeding after illness
  - ✓ Clear the nose if interferes with feeding
- Increase fluids
  - ✓ Offer the child extra to drink
  - ✓ Increase breast feeding
- Soothe the throat and relieve the cough with safe remedy- The mother can soothe the child's throat and relieve the cough by giving the child tea sweetened with sugar or honey or a safe, home-made cough syrup or soothing remedy
- Watch for following signs and return quickly if they occur
  - ✓ Breathing becomes difficult
  - ✓ Breathing becomes fast
  - ✓ Child is not able to drink
  - ✓ Child becomes sicker

2. If coughing more than 30 days, refer for assessment

3. Treatment of fever, if present

- If the fever is high (39^0C or more)
  - ✓ The child will feel better and eat better if the fever is lowered with Paracetamol
  - ✓ It is harder to breathe when he or she has a high fever
- If the fever is low (38-39^0C)
  - ✓ Advise the mother to give the child more fluids than usual
  - ✓ Paracetamol is not needed
  - ✓ Keep the child with any fever (38^0C or more) lightly clothed
  - ✓ Overwrapping or overdressing will make the child uncomfortable and may make the fever worse

**** Fever alone is not a reason to give an antibiotic except in a young infant (age less than 2 months).*

4. Treatment of wheezing, if present

- Children with first episode of wheezing
  - ✓ If in respiratory distress- give a rapid-acting bronchodilator (nebulized salbutamol) and refer. If a rapid-acting bronchodilator is not available then, give the first dose of an oral bronchodilator and refer the child immediately to a hospital
  - ✓ If not in respiratory distress- give oral salbutamol
- Children with recurrent wheezing (asthma)
  - ✓ Give a rapid-acting bronchodilator
  - ✓ Assess the child's condition 30 minutes later

If	Then
Respiratory distress or any danger signs	- Treat for severe pneumonia or very severe disease and refer
No respiratory distress and	
a) Fast breathing	- Treat for pneumonia - Give oral salbutamol
b) No fast breathing	- Treat for no pneumonia cough or cold - Give oral salbutamol

5. Assessment and treatment of ear problem or sore throat, if present

6. Assessment and treatment of other problems such as diarrhoea or skin problems

7. Check for the child's immunization status and immunize if needed.

DIABETES MELLITUS

6

Definition

Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves.

People who think they might have diabetes must visit a physician for diagnosis. They might have some or none of the following **symptoms-**

- Frequent urination
- Excessive thirst
- Unexplained weight loss
- Extreme hunger
- Sudden changes of vision
- Tingling or numbness in hands or feet
- Feeling very tired much of the time
- Sores that are slow to heal
- More infections than usual
- Very dry skin

Diagnostic criteria

A person is diagnosed as a diabetic if any two of the following criteria are present-

1. More than one characteristic symptoms and signs of DM
2. Fasting plasma glucose >126 mg/dl (7.0 mmol/l)
3. Plasma glucose 2hrs after breakfast/ after taking 75 gm glucose >200 mg/dl (11.1 mmol/l)
4. Random plasma glucose ≥200 mg/dl (11.1 mmol/l) for more than one occasion
5. Presence of diabetic retinopathy

Diabetic patients may come with the following ways

- As unknown case (first presentation)
- As a known case with complications of uncontrolled DM
- Due to other diseases with coexisting DM (controlled/ uncontrolled)
- Acute life threatening conditions (DKA/ hyper osmolar coma/ hypoglycaemia)

Types of DM

1. Type- I DM (IDDM: Insulin-Dependent Diabetes Mellitus)
2. Type- II DM (NIDDM: Non Insulin-Dependent Diabetes Mellitus)
3. Gestational DM
4. Other specific types
    - Drug induced (eg- Corticosteroids)
    - Viral infections (eg- Congenital rubella, mumps. Coxsackie virus B)
    - Pancreatic diseases (eg- chronic pancreatitis, haemochromatosis)
    - Endocrine diseases (eg- acromegaly, Cushing syndrome, thyrotoxicosis)
    - Genetic defects of β cell function
    - Genetic defects of insulin action
    - Genetic syndromes (eg- Down syndrome, Turner syndrome)
    - Uncommon form of immune mediated DM

Complications of DM

A. Acute complications
- Hypoglycemia
- Diabetic ketoacidosis
- Hyperosmolar nonketotic diabetic coma
- Lactic acidosis
- Infections- boil, carbuncle, abscess, cellulitis

B. Long term complications

1. Micro vascular
    - Neuropathy
    - Nephropathy
    - Retinopathy, cataract
    - Foot complications
2. Macro vascular
    - Coronary circulation- Myocardial ischaemia, infarction
    - Cerebral circulation- TIA, CVD
    - Peripheral circulation- Ischaemia, claudication
    - Foot complications- Ulcer, gangrene

Goals of treatment of diabetes are

- Controlling blood sugar (glucose) level is the major goal of diabetes treatment, in order to prevent complications of the disease.
- Management of diabetes involves more than keeping blood sugar level under control, although **learning about hypos and hypers** is a great place to start.
- Managing diabetes should also encompass keeping blood pressure and cholesterol level under control, maintaining weight and dealing with the emotional impact of the condition.

Management of type- II diabetes includes

- Diet- Healthy eating
- Discipline- Regular exercise
- Drugs- OHAs (Oral Hypoglycemic Agents) or insulin therapy
  - ◆ Principles of initiation of drug treatment of DM
    - ✓ First start with low dose monotherapy
    - ✓ If not controlled then increase the dose
    - ✓ If not controlled then add combination therapy
    - ✓ If not controlled then start insulin

These steps will help to keep blood sugar level closer to normal, which can delay or prevent complications.

Drugs used as OHA

Three types of OHA

1. Insulin secretagogues (Sulfonylureas, Meglitinides/Glinides)
2. Insulin sensitizers (Biguanides, Thiazolidinediones)
3. Others- reduce glucose absorption from GI tract (Acarbose)

Special attention

OHA should be avoided in

- o Renal impairment
- o Hepatic impairment both acute and chronic diseases.

◆ So stop drug if patient develops ARF or jaundice

◆ SGPT and s. creatinine should be done before starting drugs

Medical/ drug treatment of DM

Choice of drugs depend on

a)Type of DM

1. Type- I DM: always insulin
2. Type- II DM: needs OHA or insulin or both

b) On the basis of BMI status

1. BMI > 25 kg/m^2 (Overweight)
   - Start with- **Insulin sensitizers-** (Biguanides- eg; Metformin)
   - If not controlled then add- **Insulin secretagogues-** (Sulfonylureas, Meglitinides/Glinides) or **Insulin sensitizers** (Thiazolidinediones)
   - If not controlled- then **Insulin**
2. BMI ≤ 25 kg/m^2 (Normal weight)
   - Start with- **Insulin secretagogues-** (Sulfonylurea or Glinide)
   - If not controlled then add- **Insulin sensitizers-** (Metformin or Thiazolidinediones)
   - If not controlled- then **Insulin**

c) With other associated complications

- Whatever the type and status of BMI choice is **Insulin**

d) On the basis of severity of hypoglycaemia

1. Mild fasting glucose (FBS <10.0 mmol/L)
   - Diet and exercise and follow up
2. Moderate fasting glucose (FBS <14.0 mmol/L)
   - Diet and exercise
   - Wait for 2 – 4 weeks
   - If no improvement, then start **OHA**
3. Severe fasting glucose (FBS >14.0 mmol/L)
   - Start **OHA**
   - Initiation of **insulin** is preferred

1) Insulin secretagogues- (Sulfonylureas, Meglitinides/Glinides)

Table- 6.1 : Sulfonylureas

Examples	Starting dose	Maximum daily dose	
Glibenclamide (5 mg)	1.25 mg – 2.5 mg	15 mg	○ Preferably **single dose** as the drugs have long plasma half life ○ If high dose is needed give it in **two divided dose** ○ But **never** give in **three divided doses** ○ Dose can be increased every **1 to 2 weekly** until desirable glycaemia is achieved ○ **FBS and 2HABF** for at least two days each week.
Glipizide (5 mg)	2.5 mg – 5 mg	40 mg	
Gliclazide (80 mg)	20 mg – 40 mg	320 mg	
Glimepiride 1 mg / 2 mg	0.5 mg	6 – 8 mg	

Table- 6.2 : Meglitinides/Glinides			
Examples	**Starting dose**	**Maximum daily dose**	○ **Should be taken 3 times 10 – 20 minutes before meal**
Repaglinide	0.5 mg	8 mg	○ **No meal: No dose**
Nateglinide	120 mg	360 mg	○ Suitable for **post prandial surge;** decrease glucose after meal ○ Suitable for patients with irregular meal habits ○ Duration of action: 2 – 4 hours, onset of action after 5 – 10 minutes ○ Preferable, where hypoglycaemia tendency is more. Such as old age, where particularly reluctant to take food in appropriate amount and frequency

2) Insulin sensitizers (Biguanides, Thiazolidinediones)

Table- 6.3 : Biguanides			
Examples	**Starting dose**	**Maximum daily dose**	It is taken 1-3 divided doses with meals or just after meal ▪ Disadvantages: It may cause GIT upset, lactic acidosis ▪ Do- s. creatinine and liver function tests before starting therapy ▪ Do- FBS and 2HABF, 2 weekly and HbA1c, 3 monthly
Metformin 500 mg/ 850 mg	500 mg	2000 mg	

Contraindications of Biguanides

- o Hepatic and renal impairment (s. creatinine ≥ 1.5 mg/dl in male and ≥ 1.4 mg/dl in female)
- o Increasing proteinuria
- o Predisposition to lactic acidosis
- o Heart failure (CCF)
- o Severe infection or trauma
- o Dehydration
- o Alcohol
- o Pregnancy and lactation

Table- 6.4 : Thiazolidinediones			
Examples	**Starting dose**	**Maximum daily dose**	**Dose : daily morning dose** **Inform the patient that:** ○ Decrease in glucose may not be apparent for 4 weeks ○ Maximum efficacy of dose may not be observed before 4-6 months
Rosiglitazone 4 mg / 8 mg	4 mg	8 mg	
Pioglitazone 15 mg / 30 mg	15 mg	45mg	

Thiazolidinediones		
Contraindications	**Indications**	**Side effects**
○ ALT >2.5 times the upper limit of normal ○ Hepatic disease ○ Alcohol abuse ○ NYHA class III or IV- Heart failure	○ As monotherapy and ○ In combination with • Metformin • Sulfonylureas and • Insulin ○ **Combining 2 sensitizers** from different drug classes produces an additive effect	○Oedema ○Weight gain ○Congestive cardiac failure ○Anaemia

**NYHA- New York Heart Association*

3) Others reduce glucose absorption from GI tract (Acarbose)

Table- 6.5 : Others- Reduced glucose absorption from GI tract decrease postprandial hyperglycaemia			
Examples	**Starting dose**	**Maximum daily dose**	**Dose:** 1 – 3 times with first bite of meal Major side effects: - Diarrhoea, - Abdominal pain - Flatulence
Acarbose 50 mg	25 – 50 mg	300 mg in divided dose	

4) Insulin

- Insulin therapy is indicated in those who meet the following criteria:

1. Type- I DM patients
2. Type-II DM patients
   - o Who remain persistently symptomatic hyperglycaemic on maximum dose of oral agents and diet (primary/ secondary failure).
   - o Acute stress, such as –
     - ✓ Infection
     - ✓ Trauma
     - ✓ Myocardial infarction
     - ✓ Stroke

- Diabetes with advanced complication
  - ✓ Eye disease: Proliferative retinopathy
  - ✓ Kidney disease
  - ✓ Acute metabolic neuropathy
- History of ketosis/ ketoacidosis (DKA/ HONK)
- Symptomatic hyperglycaemia
- Lean, symptomatic patients
- Prior to surgery
- Pregnancy
  - ✓ At least 3-4 months planning prior to conception
  - ✓ Throughout pregnancy
  - ✓ Also, if planning for pregnancy.

- Dose of insulin is (0.2 – 0.4 unit/kg body wt/day) usually we count 0.3unit/kg body wt/day

There are four types insulin, available on the basis of onset and duration of action (absorption of insulin from its site of injection)

Table- 6.6 : Different types of insulin

Type	Generic name	Onset	Peak	Max.	Dosage
Ultra short acting	Insulin analogues • Lispro • Aspart • Glulisine	5-15 min	30-90 min	<5 hr	Take immediately before meal/ during meal and thrice daily
Short acting/ rapid	Soluble • Regular	30-60 min	2-3 hr	5-8 hr	15 min before meal and thrice daily
Intermediate acting	Basal • Lente • Isophane (NPH-Neutral Protamine Hagedorn)	2-4 hr	4-10 hr	10-16 hr	Usually once daily at night and may given BD
Long acting	Insulin analogues • Glargine • Detemir	2-4 hr	No peak	20-24 hr	Once daily
Combination/ mixed	Short and intermediate acting • 50% NPH/ 50% regular • 70% NPH/ 30% regular	30-60 min	Dual	10-16 hr	BD 15 min before meal, 2/3 given at morning and 1/3 given at night

Side-effects of insulin therapy

- Hypoglycaemia
- Weight gain
- Peripheral oedema (insulin treatment causes salt and water retention in the short term)
- Insulin antibodies (animal insulins)
- Local allergy (rare)
- Lipodystrophy at injection sites

Diabetes during pregnancy

- Women with type-II diabetes may need to alter their treatment during pregnancy.
- Many women will require insulin therapy during pregnancy.
- Cholesterol-lowering medications and some anti hypertensive drugs cannot be used during pregnancy.
- If a pregnant woman has signs of diabetic retinopathy, it may worsen during pregnancy. Visit ophthalmologist during the first trimester of pregnancy and at one year after delivery.

Diet- Healthy eating

Contrary to popular perception, there is no specific diabetic diet. However, it is important to center diet on these high-fiber, low-fat foods

- Fruits
- Vegetables
- Whole grains

Discipline- Physical activity

- Aim for at least 30 minutes of aerobic exercise five days of the week. Stretching and strength training exercises are important, too. If the patient has not been active for a while, start slowly and build up gradually.
- A combination of exercises- aerobic exercises, such as walking or dancing on most days, combined with resistance training, such as weightlifting or yoga twice a week- often helps to control blood sugar more effectively than either type of exercise alone.

- Contraindications of physical exercise
  - ✓ Coronary heart diseases
  - ✓ Proliferative retinopathy
  - ✓ Severe neuropathy
  - ✓ Nephropathy
  - ✓ Osteoarthritis
  - ✓ Ketonuria

Drugs

a) OHA

- When to start oral hypoglycaemic therapy?

- o First exclude the indication of insulin in this patient
- o Second if patient with type- II DM and blood glucose is high then start insulin first
- o Because if insulin is used then it will give rest to beta cells for the time being, otherwise beta cells become exhausted if oral hypoglycaemic agents are used that stimulate them to produce insulin
- o So patient with type- II DM, first give insulin in first presentation and when beta cells increase production of insulin again then transfer him in to OHA
- o How will you understand that beta cells getting started functioning or switch over to OHA?
  - ✓ Patient will produce signs-symptoms of hypoglycaemia in same dose in which he was previously euglycemic
  - ✓ Suppose a patient receiving 30 units insulin/ day and his blood sugar is controlled with that amount of insulin, now patient complaints of repeated attack of hypoglycaemia with that amount of insulin, then think that patient's beta cells are working. Gradually decrease the dose of insulin and switch on to oral hypoglycemic therapy.

b) Insulin

- How to start insulin?

- Our body has two types of insulin secretion
- One basal secretion- continuous steady secretion is about 24 units/day
- Another is bolus secretion- only surge after meal 3 time = 24 units/ day
- So total daily secretion is 48 units/ day. For this reason if total daily dose is more than 48 units then add intermediate acting insulin.

In addition to diabetes medications, doctor might prescribe low-dose aspirin therapy as well as blood pressure and cholesterol-lowering medications to help preventing heart and blood vessel diseases.

Bariatric surgery

- If the patient has type- II diabetes and his/ her body mass index (BMI) is greater than 35 kg/m^2, he/ she may be a candidate for weight-loss surgery (bariatric surgery).
- Blood sugar levels return to normal in 55 to 95 percent of people with diabetes, depending on the procedure performed.
- Surgeries that bypass a portion of the small intestine have more of an effect on blood sugar levels than do other weight-loss surgeries.
- Drawbacks to the surgery include its high cost and there are risks involved, including a risk of death.
- Additionally, drastic lifestyle changes are required and long-term complications may include nutritional deficiencies and osteoporosis.

* *The patient also needs to be informed about the danger signs and complications of DM (especially about hypoglycaemia and also others) and make aware to tackle the situation.*

✓ **Monitoring blood sugar**

- Depending on treatment plan, patient may need to check and record blood sugar level every now and then or if on insulin, multiple times a day
- Careful monitoring is the only way to make sure that blood sugar level of the patient remains within target range
- Sometimes, blood sugar levels can be unpredictable. So the patient should learn how blood sugar level changes in response to food, exercise, alcohol, illness and medication.

DIARRHOEA- OTHER

7

Definition

A person with three watery stools or more within 24 hours with or without any signs of dehydration

* Diarrhoea other- when diarrhoea is not suspected acute watery diarrhoea (cholera) or bloody diarrhoea (dysentery)

* Persistent diarrhoea- It is diarrhoea that has lasted more than two weeks

Causes of diarrhoea

A. Short term diarrhoea

1. Diarrhoea is usually a symptom of a bowel infection (gastroenteritis), which can be caused by
   - Virus- such as norovirus or rotavirus
   - Bacteria- such as *Campylobacter, Clostridium difficile, Escherichia coli, Salmonella* or *Shigella;* these can all cause food poisoning
   - Parasites- such as the *Giardia intestinalis* parasite that causes giardiasis
2. Other possible causes of short-term diarrhoea include:
   - Feelings of anxiety
   - Food allergy
   - Appendicitis
3. Medicines
   - Antibiotics
   - Antacid medicines that contain magnesium
   - Non-steroidal anti-inflammatory drugs (NSAIDs)
   - Selective serotonin reuptake inhibitors (SSRIs)
   - Statins- cholesterol-lowering medicines
   - Laxatives- medicine used to help for emptying bowels

B. Long-term diarrhoea

- Irritable bowel syndrome (IBS)- a poorly understood condition that affects the normal functions of the bowel
- Inflammatory bowel disease- conditions that cause the gut to become inflamed, such as crohn's disease and ulcerative colitis
- Coeliac disease- a digestive condition that has an adverse reaction to gluten
- Bile acid malabsorption- where bile produced by the liver builds up in the digestive system

- Chronic pancreatitis- inflammation of the pancreas
- Diverticular disease- where small bulges or pockets develop in the lining of the intestine
- Bowel cancer- this can cause diarrhoea and blood in stools

When to seek medical care

If there is-

- Signs of dehydration- including drowsiness, passing urine infrequently and feeling lightheaded or dizzy
- Blood in stool
- Persistent vomiting
- A severe or continuous stomach ache
- Weight loss
- Stool is dark or black- this may be a sign of bleeding inside stomach

To identify the cause

Following questions should be asked

- What your stools are like- for example, if they are very watery or contain blood, duration of symptoms, how often need to go to the toilet, etc
- Whether associated with other symptoms, such as a high temperature (fever)
- Whether the patient has recently eaten out anywhere- this may mean the patient has food poisoning
- Whether taking medication and if it has recently changed (drug history)
- Whether the patient has been stressed or anxious recently

Treatment

1. Oral rehydration solution with plenty of fluid & nutritional support
2. Antidiarrhoeal medicines (Racecadotril, Loperamide) to reduce diarrhoea and slightly shorten symptom
3. Treatment of the underlying causes

Prevention

- Safe drinking water
- Hand washing and personal hygiene
- Food hygiene
- Rotavirus vaccination.

DIARRHOEA- ACUTE WATERY DIARRHOEA 8

Definition

♦ **Suspected case**

Any person

- 5 years or older with severe dehydration or death caused by acute diarrhoea (three or more abnormally loose or fluid stools in the past 24 hours) **or**
- During a cholera epidemic, any person 2 years or older with acute diarrhoea (three or more abnormally loose or fluid stools in the past 24 hours) with or without dehydration

* *The term AWD is used in many settings to indicate* ***suspected cholera.***

Alert thresholds for epidemic-prone conditions commonly included in EWARN

- One case

♦ **Confirmed case (cholera)**

Cholera suspected case with

- Isolation of toxigenic (i.e., cholera toxin-producing) *Vibrio cholerae* O1 or O139 from stool or vomitus **or**
- Serologic evidence of recent infection

Diagnosis

- The only way to confirm a diagnosis is **to identify the bacteria in a stool sample.**
- **Rapid cholera dipstick tests** are now available.
- Quicker confirmation helps to decrease death rates at the start of cholera outbreaks and leads to earlier public health interventions for outbreak control.

Treatment

Cholera requires immediate treatment because the disease can cause death within hours.

- **Rehydration-** without rehydration, approximately half the people with cholera die. With treatment, the number of fatalities drops to less than 1 percent.
- **Intravenous fluids**
- **Antibiotics-** while antibiotics are not a necessary part of cholera treatment, some of these drugs may reduce both the amount and duration of cholera-related diarrhoea for people who are severely ill.
  - o Whenever possible, antibiotic therapy should be guided by susceptibility reports

- Antibiotic treatment is indicated for severely dehydrated patients who are older than 2 years. Begin antibiotic therapy after the patient has been rehydrated (usually in 4-6 hours) and vomiting has stopped
- No advantage exists for using injectable antibiotics, which are expensive
- No other drugs should be used in the treatment of cholera
- Antimicrobial agents typically are administered for 3-5 days
- **Tetracycline, doxycycline, furazolidone, trimethoprim-sulfamethoxazole (TMP-SMX), erythromycin or ciprofloxacin has** been shown effective in reducing the duration and volume of diarrhoea
- Recently, **azithromycin** has been shown to be more effective than **erythromycin** and **ciprofloxacin** and is an appropriate first line regimen for children and pregnant women.

- **Zinc supplements:** Research has shown that zinc may decrease and shorten the duration of diarrhoea in children with cholera.

DIARRHOEA- BLOODY (DYSENTERY) 9

Definition

Suspected case

A person with diarrhoea (three or more abnormally loose or fluid stools in the past 24 hours) with visible blood in stool (preferably observed by the clinician)

Alert thresholds for epidemic-prone conditions commonly included in EWARN

- Five or more cases in one location **or**
- Double the weekly average number of cases seen in the previous 3 weeks for a particular location

Confirmed case

Suspected case with stool culture positive for *Shigella dysenteriae* type-1

Causes of dysentery

- **Bacterial infections** are by far the most common cause of dysentery. These infections include *Shigella, Campylobacter, E. coli* and *Salmonella* species of bacteria. The *Shigella* and *Campylobacter* bacteria that cause bacillary dysentery are found all over the world. They penetrate the lining of the intestine, causing swelling, ulcerations and severe diarrhoea containing blood and pus. Both infections are spread by ingestion of faeces within contaminated food and water
- Dysentery is rarely caused by chemical irritants or by intestinal worms
- Intestinal amoebiasis is caused by a protozoan parasite, *Entamoeba histolytica*. People are at high risk of acquiring the parasite through food and water if the water for household use is not separated from waste water.

Symptoms

The main symptom of dysentery is frequent near-liquid diarrhoea flecked with blood, mucus or pus. Other symptoms include:

- Sudden onset of high fever and chills
- Abdominal pain
- Cramps and bloating
- Flatulence (passing gas)
- Urgency to pass stool
- Feeling of incomplete emptying
- Loss of appetite
- Weight loss
- Headache
- Fatigue
- Vomiting
- Dehydration

Other symptoms may be intermittent and may include recurring low fevers, abdominal cramps, increased gas and milder and firmer diarrhoea. The patient may feel weak and anaemic or lose weight over a prolonged period (emaciation). Mild cases of bacillary dysentery may last 4 to 8 days, while severe cases may last 3 to 6 weeks. Amoebiasis usually lasts about 2 weeks.

Complications

- **Complications from bacillary dysentery include delirium, convulsions and coma.** A very severe infection like this can be fatal within 24 hours. However, the vast majorities of infections are self-limited and resolve spontaneously without treatment.
- People with **amoebic dysentery** may experience other problems associated with amoebiasis. The most frequent complication results when parasites spread to the liver, causing an **amoebic abscess.** In this case, the patient would have a **high fever and experience weight loss and right shoulder or upper abdominal pain.** If the infection of the bowel is especially virulent, the intestinal ulcerations may lead to bowel perforation and death**.** The parasites may r**arely spread through the bloodstream, causing infection in the lungs, brain** and **other organs.**

Diagnosis

- **If a doctor suspects dysentery, a stool sample usually will be required for analysis.**
- For bacterial infections such as *Shigella*, the diagnosis is made by culture of the stool. Unfortunately, such cultures are not available in most developing countries and the diagnosis is made clinically on the basis of symptoms.
- Amoebiasis is often diagnosed by finding parasites under a microscope. An antibody blood test helps to confirm the diagnosis of amoebic dysentery or liver abscess.

Treatment

- Antiparasitic medication such as **metronidazole** is commonly used to treat dysentery caused by amoebiasis
- Antibiotics like **ciprofloxacin, ofloxacin, levofloxacin** or **azithromycin** are used to treat the organisms causing bacillary dysentery
- In addition, use the antidiarrhoeal medication **loperamide** to slow the bowel and prevent dehydration
- **It is most important to replace the fluids lost from diarrhoea.** People should try to consume enough fluids so that clear-to-light yellow urine is produced every 3 to 4 hours. While affected with dysentery, it is better to stick to a bland diet (bananas, rice, soda crackers) and avoid milk products

Prevention

Dysentery can be prevented to some extent by practicing careful personal hygiene. People who travel to or live in areas with high rates of dysentery should follow the following advice-

- Do not eat any foods cooked in unhygienic circumstances, such as from street vendors
- Only eat cooked foods that have been heated to a high temperature. Do not eat cooked foods that have cooled
- Do not eat raw vegetables. Avoid species of fruits without peels. Open fruits with peels yourself
- Drink only commercially bottled or boiled water. Do not use ice unless it has been made from purified water
- Use only bottled or boiled water to wash and to cook food in, to wash hands and to brush teeth
- Consider traveling with an alcohol-based hand sanitizer.

Table- 9.1 : Signs of dehydration, its classification and rehydration

<table>
<tr><th>Signs</th><th>Classification</th><th>Treatment</th></tr>
<tr><td>≥ 2 of the following signs-
• Lethargy/ unconsciousness
• Sunken eyes
• Unable to drink or drinks poorly
• Skin pinch goes back very slowly (≥ 2 seconds)</td><td>Severe dehydration</td><td><u>Plan C</u>
• Choice of fluid: Cholera saline, Ringer's lactate
If not available: DNS or normal saline
*** Never use- 5% Dextrose in Aqua
• Amount of fluid: 100 ml/kg
• Route of rehydration: Intravenous
Duration of rehydration as per age
<table><tr><td>Age of the child</td><td>First, give 30 ml/kg over</td><td>Then, give 70 ml/kg over</td></tr><tr><td>< 12 months</td><td>1 hour</td><td>5 hours</td></tr><tr><td>≥ 12 months</td><td>½ hour</td><td>2½ hours</td></tr></table>*during rehydration, foods other than breast milk should be withheld</td></tr>
<tr><td colspan="3">Monitoring
Reassess the child every 15-30 minutes until a strong radial pulse is present. When full amount of IV fluid has been given, reassess the child's hydration status fully and decide accordingly
✓ If signs of severe dehydration still present: Repeat IV fluid as outlined in Plan C
✓ If signs of some dehydration: Discontinue IV fluid and give ORS for 4 hours as in Plan B
✓ If no signs of dehydration: Advise mother to give ORS after each loose stool as in Plan A</td></tr>
<tr><td>≥ 2 of the following signs-
• Restless/ irritable
• Sunken eyes
• Drinks eagerly, thirsty
• Skin pinch goes back slowly</td><td>Some dehydration</td><td><u>Plan B</u>
• Choice of fluid: Oral rehydration solution
• Amount of fluid: 75 ml/kg
• Route of rehydration: oral
Duration of rehydration: 4 hours
ORS may be given as follows
<table><tr><td>Age</td><td>Up to 4 months</td><td>4 – 12 months</td><td>12 months to 2 years</td><td>2 years to 5 years</td></tr><tr><td>Weight</td><td>< 6 kg</td><td>6- <10 kg</td><td>10- <12 kg</td><td>12-19 kg</td></tr><tr><td>ml</td><td>200-400</td><td>400-700</td><td>700-900</td><td>900-1400</td></tr></table>*during rehydration, foods other than breast milk should be withheld</td></tr>
<tr><td colspan="3">Monitoring
Reassess child's hydration status after 4 hours of oral rehydration and decide accordingly-
✓ If no signs of dehydration: Advise mother to give ORS after each loose stool as in Plan A
✓ If signs of some dehydration: Rehydrate with ORS for another 4 hours as in Plan B
✓ If signs of severe dehydration present: Rehydrate with IV fluid as in Plan C</td></tr>
<tr><td>Not enough signs to classify as some or severe dehydration</td><td>No dehydration</td><td><u>Plan A</u>
• Choice of fluid
✓ Oral rehydration solution
✓ Others- chira pani, cooked rice water, yogurt
• Amount of fluid after each stool
✓ Less than 2 years: 50 – 100 ml
✓ 2 years and above: 100 – 200 ml
• Avoid- very sweet tea, soft drinks & sweetened fruit drinks</td></tr>
</table>

EYE DISEASE

10

Definition

Any problem related to one or both eyes or conjunctivae. This includes the following signs and symptoms-

- Red eye
- Irritation and/or a gritty feeling
- Pus or watery discharge
- Swelling of the conjunctiva or eyelid
- Dimness or loss of vision

Table- 10.1: Differential diagnosis/ causes

Red eye	Dimness or loss of vision
A. Conjunctival congestion 1) Conjunctivitis** 2) Foreign body in conjunctival sac** 3) Dusty or smoky atmosphere 4) Errors of refraction 5) Reflex irritation from nose 6) General condition, eg- Gout **B. Ciliary congestion** 1) Corneal foreign body** 2) Corneal ulcer** 3) Acute anterior uveitis** 4) Acute congestive glaucoma** 5) Choroiditis **C. Traumatic causes** 1) Mechanical trauma 2) Chemical trauma 3) Thermal trauma 4) Radiational trauma **Painful red eye** 1) Corneal abrasion 2) Corneal ulcer** 3) Acute anterior uveitis** 4) Corneal foreign body 5) Conjunctivitis 6) Iritis and iridocyclitis** 7) Acute congestive glaucoma 8) Ocular injury	1) Cataract 2) Refractive error 3) Corneal opacity 4) Glaucoma 5) Trachoma 6) Vitamin A deficiency 7) Others a. Trauma b. Retinoblastoma c. Infectious diseases d. Hypertensive retinopathy e. Diabetic retinopathy **Painful blind eye** 1) Absolute glaucoma 2) Sympathetic ophthalmia 3) Anterior staphyloma 4) Phthisis bulbi

9) Other causes of secondary angle closure glaucoma, eg- lens induced glaucoma 10) Endophthalmitis and panophthalmitis ****Common causes of red eye**	

Diseases of the eyelids

Stye (External hordeolum)

A) Causative organism

- Usually *Staphylococcus aureus*

B) Symptoms

1. Acute pain and swelling of the lid margin
2. Sense of heaviness and discharge

C) Signs

1. Redness and oedema of the affected lid
2. Local temperature is raised
3. A swollen area at the lid margin and it has a whitish round, raised pus point in relation to the root of a cilium
4. The swelling is tender
5. Matting of eyelashes may be present
6. Enlargement of the pre-auricular or sub-mandibular lymph node

D) Treatment

1. Hot compression 3 – 4 times daily
2. Tab. Paracetamol 500mg, 3 times daily until pain and fever subsides
3. Cap. Amoxycillin 500mg (children 250mg), 3 times daily for 7 days
4. Chloramphenicol eye drop (4 – 6 times daily) plus chloramphenicol eye ointment at bed time
5. Evacuation of pus by pulling out the affected eyelash (epilation).

Chalazion (Hailstone/ Internal hordeolum)

A) Causative organism- No such organism

B) Symptoms

1. Painless nodular swelling of the eyelid
2. Sense of heaviness in the lid
3. Mild irritation
4. Drooping of the eyelid (in case of a large or multiple chalazion)

C) Signs

1. A small nodular swelling, away from the lid margin
2. It is firm, tense and non tender
3. No sign of acute inflammation
4. Skin over the swelling is normal and free from it
5. On eversion, the tarsal conjunctiva underneath the nodule is velvety-red or purple and slightly elevated
6. Regional lymph nodes are not involved

D) Treatment

1. In case of small chalazion

- Hot boric compression twice daily
- Steroid antibiotic ointment with lids massage for a few days
- Intra chalazion injection of depot steroid, eg- Triamcinolone

2. In case of moderate to large chalazion

- Incision and thorough curettage under local anaesthesia

3. In case of marginal chalazion- Under local anaesthesia-

- Press out the material with thumb and index finger
- Electro-coagulation

4. In case of infected chalazion (internal hordeolum)

- Hot boric compression 3 to 4 times daily
- Systemic analgesics with H_2 receptor blocker
- Local antibiotic like **Chloramphenicol** eye drop or ointment
- Systemic **Tetracycline** may be required
- After the acute inflammatory stage of infected chalazion subsides, **incision and curettage** under local anaesthesia

5. Treatment of cause- eg- If refractive error, then correction of error

E) Fate of chalazion

1. May remain as such
2. Spontaneous resolution
3. Complications
   a) Increased size and causing mechanical ptosis
   b) Secondary infection- internal hordeolum (painful chalazion)
   c) Burst either through skin/ conjunctiva
   d) Malignant change- meibomian gland.

Diseases of the conjunctiva

Bacterial conjunctivitis

- **Symptoms**
  1. Redness of eyes
  2. Mucopurulent discharge
  3. Grittiness or foreign body sensation
  4. Stickiness of the eyelids
  5. Photophobia
  6. Coloured halos around the light
- **Signs**
  1. One eye may be more affected than other
  2. Lid oedema
  3. Matting of the eyelashes
  4. Conjunctival congestion and chemosis
  5. Mucopurulent discharge or flakes of muco-pus
  6. Petechial sub-conjunctival haemorrhage
- **Investigations- Conjunctival swab for**
  1. Microscopy- Gram staining and Leishman's staining
  2. Culture and sensitivity
- **Diagnostic criteria of acute muco-purulent conjunctivitis**
  1. History of sticking together of the eyelids during sleep
  2. Conjunctival type of congestion
  3. Presence of muco-purulent discharge
- **Treatment**

  A. Curative
  1. The conjunctival sac should be washed with plain water three times daily
  2. Use dark glasses to avoid photophobia
  3. Antibiotic eye drop 4 – 6 times daily, eg- Chloramphenicol
  4. Antibiotics ointment- at bed time, eg- Gentamicin
  5. 1% atropine eye drop 2 times daily if cornea is involved
  6. Steroids are contraindicated

  B. Prophylactic
  1. Patient must keep his hand clean
  2. Patient must lie on the affected side to prevent spread to the unaffected eye
  3. Personal belongings of the patient, eg- towel, pillow, handkerchief should be kept separate
- **Complications/fate**
  1. May subside spontaneously by 10 – 15 days
  2. Chronic conjunctivitis and corneal ulcer
  3. Blepharitis and chronic dacryocystitis.

Viral conjunctivitis	Allergic conjunctivitis
• **Symptoms** 1. Redness of the eye 2. Discomfort/ foreign body sensation 3. Watering of the eye (discharge- serous) 4. Photophobia • **Signs** 1. Eyelid- red and swollen 2. Eyelashes- matted with mucopurulent discharge especially in secondary bacterial infection 3. Discharge- scanty (profuse if secondary bacterial infection occurs) 4. Conjunctiva ✓ Red ✓ Swollen ✓ Follicles in the palpebral part ✓ Sub-conjunctival haemorrhage 5. Pre-auricular lymphadenopathy • **Treatment** 1. Prophylaxis against secondary bacterial infection ✓ Chloramphenicol eye drop 6 hourly for 7days ✓ Chloramphenicol eye ointment at bed time 2. Antiviral drugs ✓ Acyclovir eye ointment 6 hourly daily ✓ Others- Adenine arabinoside 3. Dark glass spectacles • **Complications** 1. Sub-epithelial corneal opacification 2. Superficial punctuate keratitis 3. Corneal erosion with ulcer.	• **Symptoms** 1. Itching 2. Redness 3. Lacrimation • **Signs** 1. Eyelids- swollen due to lid oedema 2. Conjunctival congestion ✓ Milky appearance- due to conjunctival oedema ✓ Pinkish appearance- due to conjunctival oedema and congestion 3. Diffuse papillary response 4. Balloon sign may be present- severe oedema of conjunctiva causing ballooning of conjunctiva 5. Discharge- ropy/ mucinous • **Treatment** 1. Avoidance of allergen ✓ By using sun glass/ photo sun glass 2. Antihistamine eye drop ✓ Antazoline, 1 drop 4 times daily 3. Local vasoconstrictor eye drop ✓ eg- Naphazoline 4. Topical mast cell stabilizer ✓ eg- 2% Sodium cromoglycate or ✓ 2% Lodoxamide 1 drop 2 times daily 5. Topical corticosteroid ✓ eg- Dexamethasone, 1 drop 4 times daily 6. Topical antibiotic ✓ eg- antibiotic ointment at bed time.

Table- 10.2 : Difference between bacterial, viral and allergic conjunctivitis			
Traits	**Bacterial conjunctivitis**	**Viral conjunctivitis**	**Allergic conjunctivitis**
01. Incidence	Less common	Common	Commonest
02. Conjunctival congestion	Bright red in colour	Red in colour	Pinkish in colour
03. Discharge	Purulent/ mucopurulent	Watery	Mucinous/ ropy
04. Itching	Absent	Absent	Marked
05. Corneal involvement	Absent	Usually present	Absent
06. Chemosis	Present/ absent	Absent	Marked
07. Follicle	Absent	Present	Absent
08. Papilla	Present/ absent	Absent	Present
09. Recurrence	No	No	Recurrence
10. Self limiting	No	Self limiting	No
11. Pre-auricular lymph node	Not palpable	May palpable	Not palpable

Ophthalmia neonatorum

- **Clinical features**
  1. Usually between 3 and 19 days after birth
  2. Profuse discharge from the eyes
  3. Matted eye lashes
  4. Yellowish discharge screened out the cornea
  5. Red and oedematous eyelids
  6. Conjunctival chemosis
  7. Pre-auricular lymphadenopathy
- **Investigations- Conjunctival swab for**
  1. Gram staining- for diplococci (gonorrhoea)
  2. Giemsa staining- for inclusion body (*Chlamydia*)
  3. Culture and sensitivity
  4. Immunofluorescence tests for *Chlamydia*
  5. PCR for *Chlamydia* and *Neisseria* DNA
- **Treatment**
  - ✓ **Curative**
    1. **Gonococcal infection**- Inj. Ceftriaxone intravenously (IV) or intramuscularly (IM); or cefotaxime IV or IM

Alternatively

- o Intensive penicillin therapy- Penicillin drop (freshly prepared)10,000 units/ml
  - 1 drop in every minute for 5 minutes
  - 1 drop in every 5 minutes for 15 minutes
  - 1 drop in every 15 minutes for 30 minutes
  - 1 drop in every 30 minutes for 1 hour
  - 1 drop every 1 hourly for 4 hours
  - 1 drop every 4 hourly for 3days
- o Systemic antibiotic- injectable crystalline penicillin
  - IM 50,000 units/kg in two divided dose daily for 7 days

2. Chlamydial infection

- Oral erythromycin for 2 weeks, if pneumonitis is suspected then 3 weeks
- In addition, erythromycin or tetracycline ointment

3. Other bacterial

- Chloramphenicol or neomycin ointment 6 hourly
- Systemic antibiotics may be considered in severe cases

4. Herpes simplex- Systemic aciclovir for 14 days and topical aciclovir 5 times daily

- **Prophylaxis**
  - ✓ Povidone-iodine 2.5% is a cheap and effective agent against all of the common pathogens that cause ophthalmia neonatorum
  - ✓ Erythromycin 0.5% or Tetracycline 1% ointment is used by some
- **Complications**
  1. Corneal ulcer
  2. Iritis, iridocyclitis
  3. Corneal perforation
  4. Anterior synechia
  5. Adherent leucoma
  6. Anterior staphyloma
  7. Anterior capsular cataract
  8. Panophthalmitis

Diseases of the cornea and sclera

Bacterial corneal ulcer

- **Clinical features**
  - **Symptoms**
    1. Acute pain, redness and lacrimation
    2. Photophobia
    3. Decreased vision
  - **Signs**
    1. Greyish white disc-shaped ulcer near the center of the cornea
    2. A cloudy grey area surrounds the disc
    3. Whole cornea may be hazy
    4. Violent iridocyclitis with a definite hypopyon
    5. Conjunctival and ciliary congestion
    6. Lids are oedematous
- **Investigations-**
  1. Corneal scrapping then
     - ✓ Gram staining
     - ✓ Giemsa staining
     - ✓ KOH preparation for fungus
     - ✓ Culture and sensitivity
  2. Fluorescein dye test
- **Treatment**

1. Principles of treatment

a) Control of infection
b) Relief of symptoms
c) Promotion of healing
d) Prevention of complications
e) Treatment of complications

2. Medical treatment

a) Topical antibiotic
   - ✓ Ciprofloxacin eye drop 0.3%
   - ✓ Ciprofloxacin ointment at night

b) Systemic antibiotic- tab ciprofloxacin 750mg BD for 7 – 10 days
c) Mydriatics- Atropine 1% eye drop
d) Analgesics tab ibuprofen 400mg with antiulcerant
e) Hot compression
f) Dark glass

3. **Surgical treatment-** if medical treatment failed, then surgical treatment
   a) Conjunctival hooding
   b) Tarsorrhaphy
   c) Amniotic membrane graft
   d) Keratoplasty.

Table- 10.3 : Complications of corneal ulcer

Before perforation	After perforation
1) Acute anterior uveitis	1) Anterior staphyloma
2) Hypopyon corneal ulcer	2) Total iris prolapse
3) Descemetocele or keratocele	3) Anterior polar (capsular) cataract
4) Ectatic cicatrix	4) Malignant myopia
5) Acute iridocyclitis	5) Secondary glaucoma
6) Secondary glaucoma	6) Panophthalmitis
7) Endophthalmitis	7) Orbital cellulitis
8) Perforation of the cornea and its complications	8) Purulent iridocyclitis
9) Complicated cataract	9) Phthisis bulbi
10) Corneal opacity (nebula, macula, leucoma)	10) Vitreous haemorrhage and prolapse

Viral corneal ulcer

- **Clinical features**

Symptoms

1. Mild discomfort
2. Watering
3. Blurred vision

Signs

1. Opaque epithelial cells arranged in a coarse punctate or stellate pattern
2. Central desquamation results in a linear branching (dendritic) ulcer, most frequently located centrally
3. Ends of the ulcer have characteristic terminal buds
4. Reduction of corneal sensation
5. Following healing there may be persistent punctate epithelial erosions which resolves spontaneously
6. Mild epithelial scarring may develop after healing

- **Treatment**
  1. Topical antiviral agents such as- aciclovir eye ointment (3%), 5 times daily for 3 weeks. It may require to use up to 60 days
  2. Debridement may be necessary for dendritic ulcers
  3. Analgesic, if there is pain
  4. Use of dark spectacles
- **Complications**
  1. Conjunctivitis
  2. Episcleritis
  3. Scleritis
  4. Anterior uveitis
  5. Ptosis
  6. Neurological complications
     a) Cranial nerve palsies
     b) Optic neuritis
     c) Encephalitis
     d) Contralateral hemiplegia.

Fungal corneal ulcer

- **Clinical features**

  Symptoms- A gradual onset of
  1. Foreign body sensation
  2. Photophobia
  3. Blurred vision
  4. Discharge
  5. Patients often have a history of trauma specially with vegetable matter or chronic ocular surface disease
  6. It is frequently occurring in agricultural people

  Signs- vary with infectious agent

  1. Filamentous keratitis
  - ✓ A grey-yellow stromal infiltrate with indistinct margin
  - ✓ Progressive infiltration, often surrounded by satellite lesions and hypopyon

  2. Candida keratitis
  - ✓ Yellow-white infiltrate
  - ✓ Dense suppuration
- **Investigations**
  1. Corneal scrapping for wet film preparation

2. Gram and Giemsa stain
3. Culture on Sabouraud dextrose agar media
4. Histology- involving Periodic Acid-Schiff (PAS) stain

- **Treatment**
  1. **Removal of epithelium** over the lesion
  2. **Topical antifungals** such as- natamycin 5%, amphotericin- B 0.15%, miconazole 1%, clotrimazole 1%. These should be given intensively: initially hourly for 48 hours and then reducing as signs permit. It should be continued for several weeks
  3. **A broad spectrum antibiotic** should also be used as bacterial co-infection is common
  4. **Subconjunctival fluconazole** may be used in severe cases with hypopyon
  5. **Systemic antifungal** (eg- Itraconazole 100 mg daily) may be required for severe keratitis or endophthalmitis
  6. **Excisional penetrating keratoplasty** may be required in unresponsive cases.

Table- 10.4 : Differences between bacterial, fungal and viral corneal ulcers

Traits	Bacterial corneal ulcers	Fungal corneal ulcers	Viral corneal ulcers
01. Pain and photophobia	Marked	Less	
02. Watering	Marked	Less	Marked
03. Character of ulcer	Greyish white disc shaped ulcer near the center of the cornea, A cloudy grey area surrounds the disc	Slightly elevated greyish white ulcer, The ulcer area is dry	Central desquamation results in a linear branching (dendritic) ulcer, most frequently located centrally, Ends of the ulcer have characteristic terminal buds
04. Cornea	Whole cornea may be hazy	Multiple satellite projection in the surrounding cornea	Reduction of corneal sensation
05. Iridocyclitis	Violent iridocyclitis with a definite hypopyon	Hypopyon is usually not present. But if present, is thick and immobile	
06. Suppuration		Dense suppuration in candida keratitis	No

Corneal abrasion

- **Clinical features**

Symptoms- sudden onset of

1. Sever pain
2. Redness of eye
3. Watering
4. Photophobia

Signs

1. Ciliary congestion
2. Fluorescein dye test is positive
3. Slit lamp examination- confirmatory

- **Treatment**

1. Immediate wash with normal saline, if necessary
2. Antibiotic- ciprofloxacin eye drop followed by pad and bandage for 24 hours
3. Follow up- advice the patient to come after 24 hours to exclude corneal ulcer. In majority cases it heals within 24 hours.

Corneal foreign body

- **Clinical features**

Symptoms

1. Pain
2. Redness
3. Watering
4. Photophobia
5. Foreign body sensation

Signs

1. Ciliary congestion
2. Foreign body can be seen by naked eye or by slit lamp examination
3. Fluorescein dye test- bright green stain around the foreign body
4. There may be inflammation surrounding the foreign body and ulceration

- **Treatment**

1. Sterilization of the eyelid by spirit
2. Surface anaesthesia by 0.4% oxybuprocaine, one drop 3 times at 3 minutes interval
3. Application of universal eye speculum to retract the eyelids
4. Swiping of foreign body by sterile swab stick from center to periphery. If failed, foreign body is removed by hypodermic needle
5. Application of 0.5% chloramphenicol eye ointment and a pad bandage for 24 hours
6. Follow up after 24 hours.

Fluorescein dye test

- This is a test that uses orange dye (fluorescein) and a blue light to detect foreign bodies in the eye. This test can also detect damage to the cornea.

How the test is performed

- A piece of blotting paper containing the dye is touched to the surface of the patient's eye. Then the patient is asked to blink. Blinking spreads the dye and coats the tear film covering the surface of the cornea. The tear film contains water, oil and mucus to protect and lubricate the eye.
- The physician then shines a blue light at patient's eye. Any problems on the surface of the cornea will be stained by the dye and appear green under the blue light.
- The provider can determine the location and likely cause of the cornea problem depending on the size, location and shape of the staining.

Diseases of the uveal tracts

Acute iritis/ iridocyclitis/anterior uveitis

- **Clinical features**

Symptoms

1. Severe pain worsen at night
2. Photophobia
3. Redness of eye
4. Lacrimation

Signs

1. **Visual acuity**- is usually good at presentation except very severe cases with hypopyon
2. **Eyelid**- swollen
3. **Conjunctiva-** ciliary congestion (circumcorneal congestion)
4. **Cornea-** corneal oedema, keratic precipitates (inflammatory cells over the endothelium) and posterior corneal opacities
5. **Anterior chamber-** aqueous flare, aqueous cells and may be hypopyon and hyphaema
6. **Iris-** muddy colour, iris nodule, iris atrophy and posterior synechia
7. **Pupil-** constricted, irregular, non-reacting to light
8. **Lens-** pigmentation on the anterior surface of the lens, exudates, complicated cataract

9. **Vitreous-** exudates and inflammatory cells
10. **Intra ocular pressure-** normal/ increased/ decreased
11. **Ciliary tenderness-** present

- **Investigations**
  1. Total and differential count of WBC
  2. ESR
  3. Blood sugar level to rule out diabetes mellitus
  4. Blood uric acid level in patients suspected of having gout
  5. Serological tests for syphilis, toxoplasmosis and histoplasmosis
  6. Routine urine examination and urine culture to detect urethritis
  7. Stool examination for cyst and ova to rule out parasitic infestations
  8. Radiological examinations- x-rays of chest, paranasal sinuses, sacroiliac joints and lumbar spine

- **Treatment**
  1. **General treatment**
     - Rest
     - Use of dark glass
     - Hot compression
     - Rest in middle of day
     - Early sleep
  2. **Local treatment**
     - Atropine sulphate 1% eye drop 3 times daily
     - Local steroid- Dexamethasone/ Betamethasone
       - ✓ In severe case- 1 drop half hourly
       - ✓ In moderate case- 1 drop 1 – 2 hourly
       - ✓ In mild case- 1 drop 6 hourly
     - Subconjunctival injection of mydriatics (Atropine + Adrenaline + Procaine)
  3. **Systemic**
     - **Analgesic-** Diclofenac sodium
     - **Oral prednisolone-** at tapering dose
     - **Sedative-** Diazepam
     - **Immunosuppressive agents-** antimetabolites and immunomodulators
  4. **Treatment of complication-** treatment of cataract, secondary glaucoma etc.

Xerophthalmia

- The characteristic ocular manifestations of vitamin- A deficiency ranging from night blindness to corneal melting are termed as "Xerophthalmia".
- Eye signs of xerophthalmia/ ocular manifestation of vitamin- A deficiency (according to WHO) are listed in table 10.5.

Table- 10.5 : WHO classification of xerophthalmia	
XN	Night blindness
X1A	Conjunctival xerosis
X1B	Bitot's spot
X2	Corneal xerosis
X3A	Corneal ulceration/ keratomalacia < 1/3rd of corneal surface
X3B	Corneal ulceration/ keratomalacia > 1/3rd of corneal surface
XS	Corneal scarring
XF	Xerophthalmic fundus

- **Conditions caused by deficiency of vitamin- A**
  1. Xerophthalmia
  2. Dry and scaly skin
  3. Atrophy of salivary glands and they stop secretion
  4. Infections and diarrhoea
  5. Metaplasia of respiratory lining and genito-urinary epithelium
  6. Stone formation in urinary tract
  7. Growth failure
- **Treatment** of xerophthalmia/ vitamin- A deficiency

1. Curative treatment

Table- 10.6 : Treatment schedule of vitamin-A		
Age	**Dose (IU)**	**Day**
< 6 months	50,000	0, 1, 14
6 months– 1year	100,000	0, 1, 14
> 1 year	200,000	0, 1, 14

2. Eye care in case of corneal involvement

- Broad spectrum antibiotic ointment, eg- ciprofloxacin 8 hourly
- Atropine ointment 2 times daily
- Artificial tear in selected cases
- Advise to take high vitamin- A rich diet

3. **Treatment of the cause**
   - o Treatment of malabsorption in diarrhoeal diseases
   - o Treatment of PEM and measles
4. **Preventive treatment**
   - o Health education about vitamin- A
   - o Increasing the dietary intake of foods rich in vitamin- A and provitamin- A
   - o Promotion of breast feeding as long as possible
   - o Periodic administration of a large dose of vitamin- A, 6 months interval from 6 months to 6 years
   - o Improved health services to mother and children
5. **Operative treatment-** For restoration of vision- keratoplasty can be done if there is corneal opacification.

Ocular injury

Classification of ocular injury

1. Blunt trauma- caused by blunt objects
2. Penetrating/ perforating injury- caused by sharp objects or foreign bodies
3. Chemical injuries/ burns- caused by alkaline or acidic substances
4. Thermal burns
5. Radiational injuries

❖ **Management of blunt trauma in eye**

1. **General**
   - o Proper history taking
   - o Assessment of injury
   - o Rest
2. **Symptomatic**
   - o Analgesic (no steroid)
3. **Specific**
   - o Rest
   - o Antibiotic- to prevent secondary infection
   - o Treatment according to injury
4. **Treatment of complications**

❖ **Management of chemical (acid and alkali) burn of the eye**

- **Acid burn**- less dangerous as acid coagulate protein which prevent further entrance
- **Alkali burn**- more dangerous as it penetrates the cornea and other tissues (by causing liquefactive necrosis)

◆ **Clinical features of acid burn**

- **Symptoms**
  1. History of splashing acid into the eye
  2. Eye become red and painful
  3. Blurred vision
- **Signs**
  1. Vision- decreased in involved eye
  2. Lids- some evidence of acid burn (on skin of the face also)
  3. Conjunctiva- diffusely red
  4. Cornea- grey in appearance
  5. Pupil- smaller in involved eye
  6. Local anaesthesia- relieves pain
  7. Finger tension- symmetric

◆ **Clinical features of alkali burn**

a) Acute phase

1. Conjunctival chemosis, congestion and lacrimation
2. Perilimbal ischaemia
3. Corneal epithelial defects and stromal clouding
4. Increased intraocular pressure

b) Early reparative phase (1 – 3 weeks)

1. Conjunctival and corneal epithelium begin to regenerate
2. Formation of corneal opacity with neovascularization
3. Iridocyclitis

c) Late reparative phase

1. Irregular scarring of the cornea
2. Formation of descematocele
3. Dry eye (due to scarring of the ducts of the lacrimal glands and goblet cells)
4. Cataractous changes

◆ **Treatment**

1. Vigorous washing of the eye with normal saline, if not available wash with water
2. Removal of particles carefully with the help of a sterile swab stick or forceps
3. Chloramphenicol eye ointment 8 times daily along with prophylactic sweeping or glass rod to prevent symblepharon
4. Dexamethasone eye drop (0.1%), 6 hourly and dexamethasone eye ointment at bed time
5. For relieving pain by cycloplegia- atropine eye drop (1%), 1 drop 8 hourly
6. Tablet vitamin- C, 1gm daily for rapid healing

◆ **Complications of chemical burn**

1. Symblepharon
2. Ectropion
3. Entropion
4. Trichiasis
5. Perforation of cornea and its sequelae
   a) Iris prolapse
   b) Iridocyclitis
   c) Endophthalmitis
   d) Panophthalmitis.

Refractive errors/ ametropia

Myopia (short sightedness)	Hypermetropia (long sightedness)	Astigmatism	Presbyopia
• **Clinical features** o **Symptoms** 1) Impaired distance vision 2) Eye strain 3) Black floaters 4) Delayed dark adaptation 5) Sudden loss of vision o **Signs** 1) Prominent eyeball 2) Large cornea 3) Deep anterior chamber 4) Apparent convergent squint 5) Posterior cortical cataract may be present 6) Degeneration of vitreous may be present 7) **Ophthalmoscopically** ✓ Large disc ✓ Large physiological cup of the disc ✓ Temporal crescent or sometimes annular crescent ✓ Posterior staphyloma ✓ Macula- Fuchs' spot	• **Clinical features** o **Symptoms** 1) Blurred vision 2) Eye strain 3) Artificial myopia- due to excessive accommodation and spasm of ciliary muscles 4) Convergent squint 5) Early onset of presbyopia 6) Headache due to continuous strain on accommodation o **Signs** 1) Small eyeball 2) Small cornea 3) Shallow anterior chamber 4) Apparent divergent squint 5) **Ophthalmoscopically** ✓ Optic disc smaller and hyperaemic ✓ Less defined edges ✓ Shot silk retina ✓ Blood vessels- undue tortuosity	• **Clinical features** o **Symptoms** 1) Decrease in visual acuity 2) Eye strain/ asthenopia 3) Eye ache & headache 4) Running together of letter while reading o **Signs** 1) Head tilt in children 2) Half closure of the lids 3) Signs of causative factor, eg- scarring of cornea, decentration of lens 4) **Ophthalmoscopically** ✓ Disc appears oval or tilted in high degree of astigmatism	• **Clinical features** 1) Gradual difficulty in reading small print, particularly in dim illumination 2) Inability to perform near work meticulously, eg- sewing, threading a needle etc 3) Fatigue or headache while doing near work 4) Arms are not long enough, is a common experience

• **Complications** of pathological myopia 1) Retinal tear 2) Retinal haemorrhage 3) Vitreous haemorrhage 4) Open angle glaucoma 5) Posterior capsular cataract	• **Complications** of hypermetropia 1) Amblyopia- in high hypermetropia 2) Accommodative convergent squint 3) Angle closure glaucoma 4) Early onset of presbyopia	• **Investigations** 1) Retinoscopy 2) Keratometry- to measure the corneal curvature, 3) Photo-keratoscope 4) Computerized corneal topography	• **It is not a refractive error** 1) It is a physiological aging process 2) It usually occurs after age of 40 years
• **Treatment** o **Optical** 1) Spectacle- spherical concave lens 2) Contact lens o **Surgery** 1) Radial keratectomy 2) Keratophakia 3) Keratomileusis o **Laser** 1) Photo refractive keratoplasty (LASIK) o **General** 1) Good nutritional diet 2) Fresh environment 3) Proper position of reading in good light 4) Protect the eye from any trauma	• **Treatment** o **Optical** 1) Spectacle- spherical convex lens 2) Contact lens- the power is little more than spectacle power o **Surgery** 1) Keratophakia 2) Epikeratophakia 3) Keratmileusis 4) IOL implantation o **Laser** 1) Photo refractive keratoplasty (LASIK)	• **Treatment** o **Regular astigmatism** 1) Spectacles 2) Contact lens 3) Surgery 4) Laser o **Irregular astigmatism** 1) Best treatment is by contact lens 2) Laser may be helpful 3) Spectacle correction is not possible	• **Treatment** 1) Usually by bifocal lens 2) Contact lens 3) Refractive surgery (LASIK)

FEVER UNEXPLAINED > 101°F / 38.5°C

11

Definition

Unexplained fever is a febrile illness before diagnosis has been established; also referred to as PUO (pyrexia of unknown origin), in which there is

- Temperature higher than 38.3°C on several occasions
- Fever lasting more than three weeks and
- Failure to reach a diagnosis despite one week of inpatient investigation

❖ This strict definition prevents common and self-limiting medical conditions from being included as PUO.

❖ The four categories of potential aetiology of PUO are centered on patient subtype

Table- 11.1 : Classification of pyrexia of unknown origin (PUO)

Category of PUO	Definition	Common aetiologies
Classic	Temperature >38.3°C (100.9°F)	Infection, malignancy, collagen vascular disease
	Duration of >3 weeks	
	Evaluation of at least 3 outpatient visits or 3 days in hospital	
Nosocomial	Temperature >38.3°C	*Clostridium difficile* enterocolitis, drug-induced, pulmonary embolism, septic thrombophlebitis, sinusitis
	Patient hospitalized ≥24 hours but no fever or incubating on admission	
	Evaluation of at least 3 days	
Immune deficient (neutropenic)	Temperature >38.3°C	Opportunistic bacterial infections, aspergillosis, candidiasis, herpes virus
	Neutrophil count ≤ 500 per mm^3	
	Evaluation of at least 3 days	
HIV-associated	Temperature >38.3°C	Cytomegalovirus, *Mycobacterium avium-intracellulare* complex, *Pneumocystis carinii* pneumonia, drug-induced, Kaposi's sarcoma, lymphoma
	Duration of >4 weeks for outpatients, >3 days for inpatients	
	HIV infection confirmed	

Table- 11.2 : Common aetiologies of pyrexia of unknown origin			
Infections	Malignancies	Autoimmune conditions	Miscellaneous
• Tuberculosis (especially extrapulmonary) • Abdominal abscesses • Pelvic abscesses • Dental abscesses • Endocarditis • Osteomyelitis • Sinusitis • Cytomegalovirus • Epstein-Barr virus • Human immunodeficiency virus (HIV) • Lyme disease • Prostatitis • Sinusitis	• Chronic leukaemia • Lymphoma • Metastatic cancers • Renal cell carcinoma • Colon carcinoma • Hepatoma • Myelodysplastic syndromes • Pancreatic carcinoma • Sarcomas	• Adult Still's disease • Polymyalgia rheumatica • Temporal arteritis • Rheumatoid arthritis • Rheumatoid fever • Inflammatory bowel disease • Reiter's syndrome • Systemic lupus erythematosus • Vasculitides	• Drug-induced fever • Complications from cirrhosis • Factitious fever • Hepatitis (alcoholic, granulomatous or lupoid) • Deep venous thrombosis • Sarcoidosis

Diagnosis

1. History

The history for PUO should be highly detailed. The characteristics of the fever, including duration, accompanying symptoms such as rigors and drenching sweats, timing of fever and any precipitating events, should be sought. Symptoms concurrent to the febrile illness will often be the key to identification of cause. If none is forthcoming, it is particularly important to elicit several key features of the more common and severe aetiologies.

2. Table- 11.3, showing important areas of focus for history, examination and baseline investigations in pyrexia of unknown origin

Table- 11.3 : Approach to a patient with PUO		
History	Examination	Investigation
• Drenching night sweats • Weight loss • Headache • Haemoptysis • Altered bowel habits • Occupation • Travel • Recreational activities • Injecting drug use • Medications	• Measurement of fever • Lymphadenopathy • Scalp tenderness • Hepatosplenomegaly • Cardiac murmurs • Respiratory auscultation • Rashes	• Full blood count • Liver function tests • ESR, CRP • HBV, HCV, HIV • Urine culture • Blood culture • ANA, RF • EPG • Chest x-ray • Abdominal CT • Echocardiography
ANA- antinuclear antibodies; CT- computed tomography; CRP- C-reactive protein; EPG- serum protein electrophoresis; ESR- erythrocyte sedimentation rate; FBC- full blood count; HBV- hepatitis B virus; HCV- hepatitis C virus; HIV- human immunodeficiency virus; RF- rheumatoid factor.		

Second-line investigations that may be considered under specific circumstances include HIV testing,

- Lactate dehydrogenase (LDH)
- Ferritin
- Thyroid function test (TFT) and
- Infectious diseases testing appropriate for any specific risk factors

Treatment

- In the majority of cases, treatment other than supportive care should not be commenced until a diagnosis is obtained. Due to the wide range of differentials, therapeutic trials are not recommended. This approach to PUO of awaiting diagnosis before considering treatment is suggested as the mortality of PUO is low and early use of antipyretics or antimicrobials may delay diagnosis. The mortality rate for PUO is less than 10%, with most deaths occurring as a result of malignancy.
- Specific treatment is according to the cause.

12 FEVER- SUSPECTED HAEMORRHAGIC

Case definition

Any person with

- Acute onset of fever of less than 3 weeks duration in a severely ill patient and
- Two of the following signs-
  - ✓ Haemorrhagic or purpuric rash
  - ✓ Bleeding from the nose (epistaxis)
  - ✓ Vomiting of blood (haematemesis)
  - ✓ Coughing up blood (haemoptysis)
  - ✓ Blood in stools
  - ✓ Other haemorrhagic symptoms and absence of predisposing host factors for haemorrhagic manifestations

Alert thresholds for epidemic-prone conditions commonly included in EWARN

- One case

** Acute haemorrhagic fever syndromes can be attributable to Dengue (Dengue haemorrhagic fever), Ebola-Marburg viral diseases, Lassa fever, Yellow fever, Rift Valley fever, Hantavirus infections, Crimean-Congo haemorrhagic fever and other viral, bacterial or rickettsial diseases with a potential to produce epidemics. All cases of acute haemorrhagic fever syndrome whether single or in clusters, should therefore be notified early, without waiting for the causal agent to be identified, according to the syndromic approach of revised International Health Regulations (IHR).

Signs and symptoms of viral haemorrhagic fever

Specific signs and symptoms vary by the type of VHF, but initial signs and symptoms often include

- Marked fever, fatigue, dizziness, muscle aches, loss of strength and exhaustion
- Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs or from body orifices like the mouth, eyes or ears. However, although they may bleed from many sites around the body, patients rarely die because of blood loss
- Severely ill patient cases may also show shock, nervous system malfunction, coma, delirium and seizures
- Some types of VHF are associated with renal (kidney) failure

Diagnosis

- Cases are diagnosed with a blood test, either PCR or serology or both, depending on the virus.
- Testing is done in a public health laboratory with special biosafety features and appropriate safety procedures are followed during the collection and transport of specimens.

Treatment

Patients receive supportive therapy, but generally speaking, there is no other treatment or established cure for VHFs.

Prevention and control

- Hosts that carry haemorrhagic fever viruses are rodents, disease prevention efforts include:
  - ✓ Controlling rodent populations
  - ✓ Discouraging rodents from entering or living in homes or workplaces
  - ✓ Encouraging safe cleanup of rodent nests and droppings.
- For haemorrhagic fever viruses spread by arthropod vectors, prevention efforts often focus on community-wide insect and arthropod control. In addition, people are encouraged to use insect repellant, proper clothing, bed nets, window screens and other insect barriers to avoid being bitten.
- For those haemorrhagic fever viruses that can be transmitted from one person to another, avoiding close physical contact with infected people and their body fluids is the most important way of controlling the spread of disease.

Dengue fever

Case definition

Probable case

A probable case requires:

- Clinical evidence[1] and
- Laboratory suggestive evidence[2] and
- Epidemiological evidence[4]

or

- Clinical evidence and
- Household epidemiological evidence[5]

Confirmed case

A confirmed case requires:

- Clinical evidence and
- Laboratory definitive evidence[3]

1. Clinical evidence- A clinically compatible illness (e.g. fever, headache, arthralgia, myalgia, rash, nausea/vomiting)
2. Laboratory suggestive evidence
   - Detection of NS1 antigen in blood by a rapid antigen test or
   - Detection of dengue virus-specific IgM in blood

3. Laboratory definitive evidence

- Isolation of dengue virus or
- Detection of dengue virus by nucleic acid testing or
- Detection of non-structural protein 1 (NS1) antigen in blood by EIA or
- IgG seroconversion or a significant increase in antibody level or a fourfold or greater rise in titre to dengue virus, proven by neutralization or another specific test or
- Detection of dengue virus-specific IgM in cerebrospinal fluid, in the absence of IgM to Murray Valley encephalitis, West Nile virus/ Kunjin or Japanese encephalitis viruses

4. Epidemiological evidence

Exposure, between 3 and 14 days prior to onset, in either

- A country with known dengue activity or
- A dengue-receptive area in where a locally-acquired or imported case has been documented with onset within a month

5. Household epidemiological evidence

- Living in the same house as a locally-acquired case in a dengue-receptive area within a month of the onset in the case and
- At least one case in the chain of epidemiologically linked cases (which may involve many cases) is laboratory confirmed.

Symptoms

Symptoms can be mild and include:

- Fever
- Rash
- Muscle and joint pain

Symptoms of dengue haemorrhagic fever include:

- Bleeding under the skin
- Frequent vomiting
- Abdominal pain

Investigations

1. Antibody titer for dengue virus types
2. Complete blood count (CBC)
3. Polymerase chain reaction (PCR) test for dengue virus types

Treatment

- Dengue fever is usually a self-limited illness. There is no specific antiviral treatment currently available for dengue fever
- Supportive care with analgesics, fluid replacement and bed rest is usually sufficient. Acetaminophen may be used to treat fever and relieve other symptoms
- Aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) and corticosteroids should be avoided
- Management of severe dengue requires careful attention to fluid management and proactive treatment of haemorrhage.

Prevention

The only way to truly prevent dengue virus acquisition is to avoid being bitten by a vector mosquito. Measures to prevent dengue fever are as follows:

- Use of N,N-diethyl-meta-toluamide (DEET)–containing mosquito repellant
- Wear protective clothing, preferably impregnated with permethrin insecticide
- Remain in well-screened or air-conditioned places
- The use of mosquito netting is of limited benefit, as Aedes are day-biting mosquitoes
- Eliminate the mosquito vector using indoor sprays.

13 GASTROINTESTINAL PROBLEMS/ PUD

Definition

Gastrointestinal system has many functions but the major one is absorption of nutrients; nutrients come from eaten food, they include carbohydrates, proteins, fats, vitamins and minerals.

Basically Gastro intestinal problems are any abnormal changes in the process of digestion and absorption via the gastrointestinal system.

Common gastrointestinal problems

- Indigestion
- Irritable bowel syndrome
- Diarrhoea
- Constipation
- Crohn's disease
- Ulcerative colitis
- Colon cancer

Common symptoms of gastrointestinal problems

- Pain in the abdomen
- Diarrhoea
- Constipation
- Dehydration
- Nausea
- Vomiting
- Cramping
- Distenstion of the abdomen
- Bloating
- Gases in the abdomen
- Heart burn
- Discomfort in the abdomen

Common causes of gastrointestinal problems

- Stress
- Antibiotics
- Processed food diet
- Low fibre diet
- Low-raw food diet
- Allergy to food

- Consumption of high amount of junk foods which have high calories content but no nutritional value
- Eating too fast without proper chewing may cause indigestion as the digestive system will find it difficult to digest large particles
- Fruits should not be eaten with other foods as they needs more time to be digested
- Drugs: almost all types of drugs can cause damage to the digestive system especially when overused or misused
- Consumption of alcohol causes difficulty in digestion
- Overconsumption of caffeine can cause irritation of the stomach lining
- Smoking and drug addiction can cause many digestive problems
- Environmental toxic substances: such as mercury, food additives, chemicals and many others
- Family history of digestive problems

Diagnosis of gastrointestinal problems

Digestive problems can usually be identified through physical examination and careful history taking. Sometimes a psychological examination is also helpful as certain GI problems have strong links to anxiety, depression and other such disorders.

Various tests may be employed, depending on the findings of the physical examination and history. For example

- Endoscopy or colonoscopy is useful for visualizing the inside of GI system
- Laparoscopy uses an endoscope to examine organs within the abdominal cavity
- X-rays may be used to search for obstructions within the GI system
- Ultrasound, CT and MRI scans may be used to look for signs of specific GI disorders
- Samples of stools may be examined for signs of infection or the presence of blood cells or fat

Treatment of gastrointestinal problems

1. Symptomatic treatment
   - Constipation can be relieved by eating more fibre, drinking plenty of fluids and exercising regularly. Laxatives, which aid the passage of stools, enemas may also be useful.

- If the patient has diarrhoea, lost fluids and electrolytes can be replaced by drinking additional fluids. Oral rehydration salts are particularly beneficial as they help replenish lost electrolytes and sugars as well as fluid. During rehydration therapy it is advisable to avoid sugary foods and drinks as these can trigger further bouts of diarrhoea. If diarrhoea is severe, intravenous fluids may be required to rehydrate and correct electrolyte deficiencies. Anti-diarrhoeal medications are available but these may not be appropriate in all instances.
- Rehydration therapy is useful for nausea and vomiting. Anti-sickness medications are available that are effective in reducing these symptoms and may also help appetite to return.

2. Nutritional support
   - Obtaining the correct balance and quantities of carbohydrate, protein, fat, fibre, minerals, vitamins, electrolytes and water is essential for health and well-being.
   - The aims of nutritional support are to prevent weight loss, promote weight gain (if required), overcome weakness and tiredness, ensure adequate hydration and promote optimal clinical outcomes.
   - The approach uses specially formulated nutritional products that are taken orally or administered as liquids via tubes into the stomach or small intestine (enteral feeding) or into the bloodstream (parenteral feeding).

3. Treating the underlying cause
   - An important first step in managing GI problems is to identify and treat any underlying diseases that may be causing the GI symptoms
   - Medication-related symptoms may be remedied by stopping treatment or switching to an alternative drug, if feasible
   - Virus-related problems normally resolve themselves within a few days.

Peptic ulcer disease (PUD)

Definition

PUD is a break in the mucosal lining of the stomach or duodenum more than 5 mm in diameter, with depth to the submucosa. Ulcers smaller than this or without obvious depth are called erosions. Peptic ulcers result from an imbalance between factors promoting mucosal damage (gastric acid, pepsin, Helicobacter pylori infection, non-steroidal anti-inflammatory drug use) and those mechanisms promoting gastroduodenal defense (prostaglandins, mucus, bicarbonate, mucosal blood flow).

Although we are getting disease diagnosis from UHC level as 'Peptic Ulcer' but in reality it can not be diagnosed at UHC level (Gastroenterological Society of Bangladesh). So the better term 'Dyspepsia' is preferable at UHC level. Dyspepsia refers to a symptom or set of symptoms that is (are) considered to originate from the gastroduodenal region.

Differential diagnosis of dyspepsia

- Peptic ulcer disease
- Gastritis
- Gastroesophageal reflux disease
- Cholecystitis, cholelithiasis
- Biliary colic
- Inferior myocardial infarction
- Referred pain (pleurisy, pericarditis)
- Pancreatitis
- Gastric carcinoma and other tumours
- Hepatic congestion
- Medications, eg- NSAIDs
- Functional dyspepsia
- Superior mesenteric artery syndrome

Alarm features or when to refer

- Unexplained weight loss
- Progressive dysphagia
- Recurrent or persistent vomiting
- Evidence of GI bleeding
- Anaemia
- Family history of gastric cancer
- New onset dyspepsia in a patient over 50 years of age
- Odynophagia
- Unexplained iron deficiency anaemia
- Palpable mass or lymphadenopathy
- Early satiety

Diagnosis

A. Medical history

- Previous history of peptic ulcer disease, H pylori infection
- Ingestion of nonsteroidal anti-inflammatory drugs (NSAIDs)
- Smoking
- Use of alcohol etc

B. Clinical features

1) Epigastric pain

- It is the most common symptom of both gastric and duodenal ulcers. It is characterized by burning sensation and occurs after meals- classically, shortly after meals with gastric ulcer and 2-3 hours afterward with duodenal ulcer.
- Food or antacids relieve the pain of duodenal ulcers but provide minimal relief of gastric ulcer pain. Duodenal ulcer pain often awakens the patient at night.

2) Other possible manifestations include the following:

- Dyspepsia, including belching, bloating, distention and fatty food intolerance
- Postprandial fullness or early satiety
- Co-existing and supportive symptoms may be- bloating, nausea and vomiting
- Heartburn
- Chest discomfort
- Haematemesis or melaena resulting from gastrointestinal bleeding. Melaena may be intermittent over several days or multiple episodes in a single day
- Rarely, a briskly bleeding ulcer can present as hematochezia
- Symptoms consistent with anaemia (eg- fatigue, dyspnoea) may be present
- Sudden onset of symptoms may indicate perforation
- NSAID-induced gastritis or ulcers may be silent, especially in elderly patients
- Only 20-25% of patients with symptoms suggestive of peptic ulceration are found on investigation to have a peptic ulcer.

C. Common investigations for dyspepsia

1. Endoscopy of upper GIT- gold standard investigation for dyspepsia
2. Investigation to exclude other diseases
   a. USG of abdomen
   b. Plain x-ray abdomen
3. Others- As H. Pylori is highly prevalent in Bangladesh. So the serological test (Anti- H. pylori antibody) is discouraged.

* Ba-meal study- This investigation is not recommended for investigation of dyspepsia now.

Treatment

- Younger people with ulcer-like symptoms are often treated with antacids or H_2 antagonists before endoscopy is undertaken

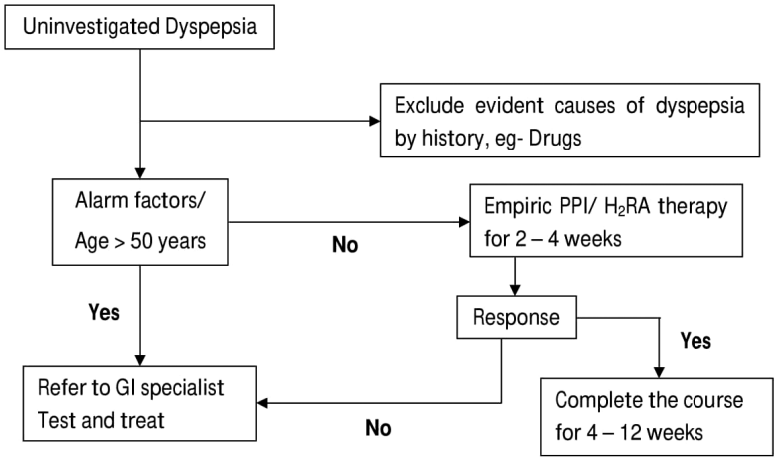
- People who are taking nonsteroidal anti-inflammatories (NSAIDs) may also be prescribed a prostaglandin analogue (misoprostol) in order to help in preventing peptic ulcers
- Acid reducing medication- H_2 antagonists or proton-pump inhibitors decrease the amount of acid in the stomach, helping with healing of ulcers
  - ✓ Doses of commonly used anti ulcer drugs:
    - o Omeprazole : 20 mg BD
    - o Pantoprazole : 20 mg BD
    - o Esomeprazole : 20 mg BD
    - o Rabeprazole : 20 mg BD
    - o Ranitidine : 150 mg BD
  - ✓ All should be given for 4 – 12 weeks
- *H. pylori* infection should be treated with triple therapy (2 antibiotics & 1 PPI)

Note:

- ✓ Anti- HP therapy should not be given empirically but if really needed should be decided by a gastroenterologist.
- ✓ Maintenance therapy with PPI/ H_2- receptpr antagonist is indicated exclusively in some cases of proven peptic ulcer disease.

- Surgery- perforated peptic ulcer is a surgical emergency and requires surgical repair of the perforation. Most bleeding ulcers require endoscopy urgently to stop bleeding with cautery, injection or clipping.

Figure- 13.1 : Management algorithm for uninvestigated dyspepsia



14 GENERALIZED WEAKNESS

Definition

Generalized weakness is one of the most common medical complaints of seniors. It is characterized by muscle weakness (a lack of physical or muscle strength and the feeling that extra effort is needed to perform daily activities that require to move arms, legs or other muscles) throughout the body. So many medical conditions can result in generalized weakness that it is one of the hardest medical complaints to diagnose.

- Feeling weak can have various causes, ranging in severity from 'minor' to 'generally fatal'. Finding the true cause means ruling out or confirming each possibility – in other words, diagnosis
- Weakness may be all over the body or in only one area, side of the body, limb or muscle. Weakness is more noticeable when it is in one area. Weakness in one area may occur:
    - A. After a stroke
    - B. After injury to a nerve
    - C. During a flare-up of multiple sclerosis
- Weakness may be subjective or objective:
    - A. Subjective means one may feel weak, but there is no real loss of strength. For example, one may feel weak if he/ she has an infection such as mononucleosis or the flu.
    - B. Objective means there is a loss of strength that can be noted during a physical examination.

Causes of generalized weakness

Weakness may be caused by a variety of conditions, including:

1. Metabolic
    - Addison's disease
    - Hyperparathyroidism
    - Low sodium or potassium
    - Thyrotoxicosis
2. Brain/ nervous system (neurologic)
    - Stroke
    - Bell's palsy
    - Guillain-Barre syndrome
    - Cerebral palsy
    - Multiple sclerosis

- Amyotrophic Lateral Sclerosis (ALS)
- Pinched nerve (for example, caused by a slipped disk in the spine)

3. Muscle diseases
    - Becker muscular dystrophy
    - Dermatomyositis
    - Muscular dystrophy (Duchenne)
    - Myotonic dystrophy

4. Poisoning
    - Botulism
    - Poisoning (insecticides, nerve gas)
    - Shellfish poisoning

5. Other
    - Anaemia
    - Myasthenia gravis
    - Polio

When to seek medical attention

If one experience any of the following symptoms:

- Dizziness
- Lightheadedness
- Confusion
- Difficulty in speaking
- Changes in vision
- Chest pain
- Difficulty in breathing

Treatment

- There is no specific treatment for generalized weakness
- The only way to fix the weakness is to treat the underlying cause.

15 HEADACHE/ UNSPECIFIC SYMPTOM

- Headache is one of the most common medical complaints; most people experience it at some point in their life. It is the most common form of pain. Headache sometimes can be difficult to describe. The pain may be throbbing, squeezing, constant, unrelenting or intermittent. The location may be in one part of the face or skull or may be generalized involving the whole head.
- Headache may arise spontaneously or may be associated with activity or exercise. It may have an acute onset or it may be chronic in nature with or without episodes of increasing severity.
- Headache is often associated with nausea and vomiting. This is especially true with migraine headaches.
- Headache can be classified as being one of three types:
    1) Primary headache
    2) Secondary headache and
    3) Cranial neuralgias, facial pain and other headaches

1. Primary headaches

Primary headaches include tension, migraine and cluster headaches, as well as a variety of other less common types of headache.

A. Tension headaches

Tension headaches are the most common type of primary headache. Tension headaches occur more commonly among women than men. According to the World Health Organization, 1 in 20 people in the developed world suffer with a daily tension headache.

Symptoms of tension headache

Common symptoms of tension headaches include

- Pain that begins in the back of the head and upper neck and is often described as a band-like tightness or pressure. It may spread to encircle the head
- The most intense pressure may be felt at the temples or over the eyebrows where the temporalis and frontal muscles are located
- The pain may vary in intensity but usually is not disabling, meaning that the sufferer may continue with daily activities. The pain usually is bilateral (affecting both sides of the head)
- The pain is not associated with an aura (described later), nausea, vomiting or sensitivity to light and sound

- The pain occurs sporadically (infrequently and without a pattern) but can occur frequently and even daily in some people
- The pain allows most people to function normally, despite the headache

Diagnosis of tension headaches

- History- The person with a tension headache
  - o Usually complains of mild-to-moderate pain that is located on both sides of the head
  - o Describes the pain as a non-throbbing tightness that is not made worse with activity
  - o Has no associated symptoms like nausea, vomiting or light sensitivity
- Physical examination
  - o Particularly the neurologic portion of the examination- it should be normal
  - o If the health-care professional finds an abnormality on neurologic examination, then the diagnosis of tension headache should be put on hold until the potential for other causes of headaches has been investigated
  - o However, there may be some tenderness of the scalp or neck muscles

B. Migraine headaches

Migraine headaches are the second most common type of primary headache. Migraine headaches affect children as well as adults. Before puberty, boys and girls are affected equally by migraine headaches, but after puberty, more women than men are affected.

Stages of a migraine

Migraines often develop in distinct stages, although not everyone goes through all of these:

1. 'Prodromal' (pre-headache) stage- changes in mood, energy levels, behaviour and appetite that can occur several hours or days before an attack

2. Aura- usually visual problems, such as flashes of light or blind spots, which can last for five minutes to an hour

3. Headache stage- usually a pulsating or throbbing pain on one side of the head, often accompanied by nausea, vomiting, and/or extreme sensitivity to bright light and loud sounds, which can last for 4 to 72 hours

4. Resolution stage- when the headache and other symptoms gradually fade away, although the patient may feel tired for a few days afterwards

Diagnosis of migraine

1) There is no specific test to diagnose migraines. For an accurate diagnosis to be made, physician must identify the pattern of recurring headaches along with the associated symptoms
2) Migraines can be unpredictable, sometimes occurring without other symptoms. Obtaining an accurate diagnosis can sometimes take time

- The main symptom of a migraine is usually an intense headache on one side of the head
- The pain is usually a moderate or severe throbbing sensation that gets worse when the patient moves and prevents him/ her from carrying out normal activities
- In some cases, the pain can occur on both sides of head and may affect face or neck

Additional symptoms

Other symptoms commonly associated with a migraine include:

- Nausea
- Vomiting
- Increased sensitivity to light and sound- which is why many people with a migraine want to rest in a quiet, dark room

Some people also occasionally experience other symptoms, including:

- Sweating
- Poor concentration,
- Feeling very hot or very cold
- Abdominal pain
- Diarrhoea

✓ Not everyone with a migraine experiences these additional symptoms and some people may experience them without having a headache.

✓ The symptoms of a migraine usually last between four hours and three days, although the patient may feel very tired for up to a week afterwards.

Symptoms of aura

About one in three people with migraines have temporary warning symptoms, known as aura, before a migraine. These include:

- Visual problems- such as seeing flashing lights, zig-zag patterns or blind spots

- Numbness or a tingling sensation like pins and needles- which usually starts in one hand and moves up towards arm before affecting face, lips and tongue
- Feeling dizzy or off balance
- Difficulty in speaking
- Loss of consciousness – although this is unusual

Aura symptoms typically develop over the course of about five minutes and last for up to an hour. Some people may experience aura followed by only a mild headache or no headache at all.

Migraine triggers

A migraine is a throbbing painful headache, usually on one side of the head, that is often initiated or "triggered" by specific compounds or situations (environment, stress, hormones and many others). They occur more often in women (75%, approximately) and may affect a person's ability to do common tasks.

Migraine headaches are often triggered to occur when the person is exposed to a specific set of circumstances:

- Flashing lights
- Anxiety and stress
- Lack of food or sleep
- Hormonal changes
- Foods (red wine, cheese, chocolate, soy sauce, processed meat and MSG: Mono Sodium Glutamate- a flavour enhancer)
- Tyramine
- Caffeine

C. Cluster headaches

Cluster headaches are a rare type of primary headache. It more commonly affects men in their late 20s though women and children can also suffer from this type of headache.

Symptoms of cluster headaches

- Cluster headaches are headaches that come in groups (clusters) separated by pain-free periods of months or years
- A patient may experience a headache on a daily basis for weeks or months and then be pain-free for years
- During the period in which the cluster headaches occur, pain typically occurs once or twice daily, but some patients may experience pain more than twice daily

- Each episode of pain lasts from 30 to 90 minutes
- Attacks tend to occur at about the same time every day and often awaken the patient at night from a sound sleep
- The pain typically is excruciating and located around or behind one eye
- Some patients describe the pain as feeling like a hot poker in the eye. The affected eye may become red, inflamed and watery
- The nose on the affected side may become congested and runny
- Unlike people with migraine headaches, those with cluster headaches tend to be restless. They often pace the floor and/or bang their heads against a wall
- People with cluster headaches can be driven to desperate measures, including suicidal thoughts

Diagnosis of cluster headaches

- The diagnosis of cluster headache is made by taking the patient's history- The description of the pain and its clock-like recurrence is usually enough to make the diagnosis.
- Physical examination
    - In the midst of an attack, the patient usually is in a painful crisis and may have the eye and nose watering as described previously.
    - If the patient is seen when the pain is not present, the physical examination is normal and the diagnosis will depend upon the history.

2. Secondary headaches

- Secondary headaches are those that are due to an underlying structural or infectious problem in the head or neck. This is a very broad group of medical conditions ranging from dental pain from infected teeth or pain from an infected sinus, to life-threatening conditions like bleeding in the brain or infections like encephalitis or meningitis.
- Traumatic headaches fall into this category including post-concussion headaches.
- This group of headaches also includes those headaches associated with substance abuse and excess use of medications used to treat headaches (medication overuse headaches). "Hangover" headaches fall into this category as well. People who drink too much alcohol may wake up with a well-established headache due to the effects of alcohol and dehydration.

Diagnosis of secondary headaches

- If there is time, the diagnosis of secondary headache begins with a complete patient history followed by a physical examination and laboratory and radiology tests as appropriate.
- However, some patients present in crisis with a decreased level of consciousness or unstable vital signs due to the underlying cause of the headache. In these situations, the health-care professional may decide to treat a specific cause without waiting for tests to confirm the diagnosis.
- For example, a patient with headache, fever, stiff neck and confusion may have meningitis. Since meningitis can be rapidly fatal, antibiotic therapy may be started before blood tests and a lumbar puncture are performed to confirm the diagnosis. It may be that another diagnosis ultimately is found, for example, a brain tumor or subarachnoid hemorrhage, but the benefit of early antibiotics outweighs the risk of not giving them promptly.

The exams and tests for secondary headaches

The patient's history and physical examination provide the initial direction for determining the cause of secondary headaches. Therefore,

- It is extremely important that a patient with new, severe headache seeks medical care
- Tests that may be useful in making the diagnosis of the underlying disease causing the headaches will depend upon the doctor's evaluation and what specific disease, illness or injury is being considered as the cause of the headaches (the differential diagnosis)
- Common tests that are considered include the following:
    a) Blood tests
    b) Computed tomography (CT scan) of the head and neck
    c) Magnetic resonance imaging (MRI) scans of the head and
    d) Lumbar puncture (spinal tap)

Specific tests will depend upon what potential issues the health-care professional and patient want to address

3. Cranial neuralgias, facial pain and other headaches

- Neuralgia means nerve pain.
- Cranial neuralgia describes inflammation of one of the 12 cranial nerves coming from the brain that control the muscles and carry sensory signals (such as pain) to and from the head and neck.

- Perhaps the most commonly recognized example is trigeminal neuralgia, which affects cranial nerve V (the trigeminal nerve).
- The sensory nerve that supplies the face and can cause intense facial pain when irritated or inflamed.

Diagnosis

A doctor will usually be able to diagnose a particular type of headache through a description of the condition, the type of pain and the timing and pattern of attacks. If the nature of the headache appears to be complex, tests may be carried out to eliminate more serious causes.

Further testing could include:

- Blood tests
- X-rays
- Brain scans, such as CT and MRI

Treatment

First need to exclude three emergency conditions of headache (SIM)

a) Sub arachnoid haemorrhage- Acute, severe headache with stiff neck but without fever

b) ICSOL- long history of daily morning headache, vomiting, papilloedema, focal neurological signs

c) Meningitis and encephalitis- Acute, severe headache with stiff neck and fever

*** So any patient with headache must do fundoscopy and without fundoscopy diagnosis of any headache will be a crime.

1. Acute Treatment

a) Over-the-counter medications taken to treat headache include
   - Pain killers or analgesics such as aspirin and paracetamol
   - Pain killers or analgesics combined with codeine
   - Pain killers or analgesics combined with a sedative
   - Non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen.

b) Prescription medications taken to treat more severe headaches include
   - Stronger NSAIDs
   - Analgesics containing stronger narcotic-type analgesics
   - Ergots such as ergotamine that have a specific action against migraine
   - Triptans such as sumatriptan, naratriptan, zolmitriptan that have a specific action against migraine
   - Anti-nausea drugs such as metoclopramide, prochlorperazine and domperidone.

2. Prophylactic (preventative) treatment

Prophylactic/preventative medication is taken daily, regardless of whether a headache is present, to reduce the incidence of severe or frequent headaches. These include:

- Pizotifen, probably the most commonly prescribed
- Beta-blockers block the beta-receptors on which adrenaline works in the nervous system as well as on blood vessels
- If the above are not working or as a first option, topiramate and valproate are neuro-modulators that have been shown to act against most forms of headache
- Amitriptyline and similar tricyclic antidepressants have an action on headache that is independent of their antidepressant action
- Methysergide

All are effective. All have side effects and all of these are prescription drugs. Many were initially introduced for some other problem and were also observed to reduce headache.

* The most common ways of treating headaches are rest and pain relief medication.
* Generic pain relief medication is available over the counter (OTC) or doctors can prescribe preventative medication, such as tricyclic antidepressants, serotonin receptor agonists, anti-epileptic drugs, and beta-blockers.
* It is important to follow the doctor's advice because overusing pain relief medication can lead to rebound headaches. The treatment of rebound headaches involves the reducing or stopping pain relief medication. In extreme cases, a short hospital stay may be needed to manage withdrawal *safely and effectively.*

3. Alternative treatments

There are a number of options available. Most are concentrated on releasing tension in the body, thus easing pressure in the head. Not all these options will work or be available to everyone. This is just a brief run-down; a qualified practitioner should be consulted before trying any of these therapies:

- Acupuncture- stimulating acupoints may ease pain by encouraging production of endorphins (natural painkillers).
- Alexander technique- can help preventing tension headaches by relieving poor posture and pressure that result from it.
- Aromatherapy- combines various scented oils and promotes relaxation and eases tension.
- Biofeedback- can be used to treat tension-type and migraine headaches- patient learns to control blood pressure, heart rate and spasms in the arteries supplying the brain through a sensory device.

- Chiropractic therapy- based on the theory that most diseases of the body are a result of a misalignment of the vertebral column with pressure on the adjacent nerves that may affect blood vessel and muscle function. Manual techniques purport to adjust the misalignment.
- Homeopathy- uses active substances found in certain medications highly diluted.
- Hydrotherapy- splashing your face with cold water before lying down for an hour can ease headache. Alternating hot and cold showers dilates then constricts the blood vessels, stimulating circulation. Ice pack on head is another option. Can help sufferer deal with headache by altering the way the body interprets messages of pain.
- Massage- can reduce muscle tension throughout the body, thereby reducing headache.
- Meditation- a recent study on migraine prevention through meditation has had very promising results, all participants reported less severe migraines.
- Naturopathy- uses only natural substances in small amounts and aims to provide a healthier balance of bodily processes.
- Osteopathy- manipulation of the neck or cranial, osteopathy may be used to correct misalignments of the vertebrae that can cause migraines.
- Physiotherapy- treating muscle tension can release pressure that may lead to headache.
- Relaxation techniques- geared towards reducing pressure in the body and the level of stress chemicals that may worsen headache.
- Shiatsu- combination of massage and pressure can restore the "energy balance" and induce relaxation.
- Yoga- can relieve muscle tension in the back of the neck and correct posture.

Different types of headaches

Some common types include:

1. Primary tension headaches that are episodic
2. Primary tension headaches that are chronic
3. Primary muscle contraction headaches
4. Primary migraine headaches with aura
5. Primary migraine headaches without aura
6. Primary cluster headache
7. Primary paroxysmal hemicrania (a type of cluster headache)
8. Primary cough headache
9. Primary stabbing headache
10. Primary headache associated with sexual intercourse
11. Primary thunderclap headache
12. Hypnic headache (headaches that awaken a person from sleep)
13. Hemicrania continua (headaches that are persistently on one side only, right or left [unilateral])
14. New daily-persistent headache (NDPH) (a type of chronic headache)
15. Headache from exertion
16. Trigeminal neuralgia and other cranial nerve inflammation
17. Secondary headaches due to:
    - o Trauma
    - o Disorders
    - o Infection
    - o Structural problems with the bones of the face, teeth, eyes, ears, nose, sinuses or other structures
    - o Substance abuse or withdrawal

When to seek medical care for a headache patient

A patient should seek medical care if their headache is:

- The "worst headache of life."
- Different than their usual headaches
- Starts suddenly or is aggravated by exertion, coughing, bending over or sexual activity
- Associated with persistent nausea and vomiting
- Associated with seizures
- Associated with recent head trauma or a fall

- Associated with fever or stiff neck. A stiff neck may be due to meningitis or blood from a ruptured aneurysm. However, most patients who complain of a stiff neck have muscle spasm and inflammation as the cause
- Associated with changes in vision, speech or behaviour
- Associated with weakness or change in sensation on one side of their body that may be a sign of stroke
- Not responding to treatment or is getting worse
- Requires more than the recommended dose of over-the-counter medications for pain
- Disabling and interfering with work and quality of life

Home remedies effective for headaches

It is important to consider that an unusual headache may need to be evaluated by a health-care professional, but in most instances, primary tension headaches may be initially treated at home.

- First steps include maximizing rest and staying well hydrated
- Recognizing and minimizing stressful situations may be of help, if that is one of the contributing causes of the headache
- If there has been a cold or runny nose recently, humidifying air may be helpful in allowing sinuses to drain
- Rubbing or massaging the temples or the muscles at the back of the neck may be soothing, as might warm compresses
- Over-the-counter pain medication may be helpful, in moderation
- Those with migraine headaches often have a treatment plan that will allow treatment at home. Prescription medications are available to abort or stop the headache. Other medications are available to treat the nausea and vomiting. Most patients with migraine headaches get much relief after resting in a dark room and falling asleep.

Headache overview

Simplified diagnostic criteria for migraine	
Repeated attacks of headache lasting 4–72 hours in patients with a normal physical examination, no other reasonable cause for the headache, and:	
At least 2 of the following features Unilateral pain Throbbing pain Aggravation by movement Moderate or severe intensity	Plus at least 1 of the following features Nausea/vomiting Photophobia and phonophobia

Classical migraine- Patients with triad of paroxysmal headache, nausea and/or vomiting and an 'aura' are said to have classical migraine or migraine with aura

Common migraine- Those with paroxysmal headache (with or without vomiting) but no 'aura' are said to have common migraine or migraine without aura

Headache of raised intracranial pressure

- o Worse in morning, improves through the day
- o Associated with morning vomiting
- o Worse while bending forward
- o Worse with cough and straining
- o Relieved by analgesia
- o Dull ache, often mild
- o Transient loss of vision

✓ Do fundoscopy to find sign of papilloedema
✓ Check for focal neurological signs.

Cluster headache (Migrainous neuralgia)

✓ Periodic, severe, unilateral periorbital pain accompanied by
  - o Unilateral lacrimation
  - o Nasal congestion and
  - o Conjunctival injection

✓ Brief (30-90 minutes)
✓ Usually does not persist for more than 10-15 minutes.

SAH (Sub Arachnoid Haemorrhage)

- o Sudden severe headache and
- o Dramatic onset
- o Thunderclap headache, sudden blow to back to head
- o Patient said he never experience such type headache ever before
- o Vomiting and neck stiffness and unconsciousness and may have focal neurological signs
- o Patient may conscious and has pain but no fever- do CT scan
- o If CT- scan negative then do LP after 12 hours to see xanthochromia

Fever with headache

- o If neck rigidity- meningitis.
- o If with heaviness of head with sinus tenderness- sinusitis.
- o Malaise and running nose- viral fever

Headache be may be due to
- o Refractory error

Treatment of migraine

- **Lifestyle modification**
  - Regular exercise
  - Regular sleep patterns
  - Avoidance of excess caffeine and alcohol
  - Avoidance of acute changes in stress levels

- **During acute attack:**
  - Tab. Naproxen (500mg) twice daily
  - Tab. Domperidone (10mg) thrice daily
  - Tab. Diazepam (5mg) stat
  - Anti ulcerant twice daily

- **In severe attack** patient need injectable NSAID
  - Inj. Ketorolac (30 mg) 1 amp IM stat
  - Inj. Ranitidine (50mg) 1 amp IM stat
  - Inj. Diazepam (10mg) 1 amp IM stat

- **For prophylaxis-** One of the following
  - Tab. Pizotifen (1.5-3.0 mg): 0.5 mg single dose daily at night, then to continue
  - Tab. Amitriptyline (10-50 mg): 10 mg single dose daily at night, then to continue
  - Tab. Propranolol (80-160 mg): 40 mg, half tablet twice daily

  **We prefer 1st one*

- **Advise** the patient that if he/she feels that he/ she might have an attack by headache soon or at beginning of headache, should take
  - Tab. Paracetamol (500mg): 2 tab stat
  - Tab. Domperidone (10mg): 2 tab stat
  - Tab. Diazepam (5mg): 1 tab stat

Treatment of tension headache

- During acute attack
  - Tab. Naproxen (500 mg): two times daily
  - Tab. Domperidone (10mg): three times daily
  - Anti ulcerant two times daily
  - Tab. Diazepam (5mg) stat

- Prophylaxis
  - Low-dose amitriptyline (10 mg) at night
  - Increase gradually to 30-50 mg
  - ✓ Tab. Amitriptyline (10 mg): 1 tab at night
  - ✓ Tab. Flupenthixol + Melitracen- 1 tab at morning & 1 tab at noon

Cluster headaches

- ✓ Periodic, severe, unilateral periorbital pain
- ✓ Accompanied by
  - Unilateral lacrimation
  - Nasal congestion and
  - Conjunctival injection
- ✓ The pain is very severe & characteristically for short duration (30-90 minutes).

Management

- Inhalation of 100% oxygen
- Acute attacks are usually halted by subcutaneous injections of sumatriptan
- May be managed like migraine severe attack

Prophylaxis

1. Prednisone 1 mg/kg up to 60 mg for 4 days then, gradully tapering over 21 days
2. Verapamil 160–960 mg/day
3. Lithium 400–800 mg/day

Trigeminal neuralgia

- o Age > 50 years
- o Unilateral
- o Along the distribution of 2nd and 3rd division of trigeminal nerve territory
- o Severe pain and brief
- o Sharp, short, stabbing pain like hot red needle
- o This pain is brief and repetitive and pain free interval lasts for weeks
- o Aggravating by chewing, speaking, washing face, shaving, brushing teeth

Treatment

Tab. Carbamazepine (up to 1200mg)
Alternately:
Gabapentin or Phenytoin may be effective

Temporal arteritis

- o Elderly patient
- o Severe throbbing pain
- o The pain is intractable, lasting until treatment commences with steroid
- o Unilateral pain with tenderness over scalp; overlying superficial temporal artery
- o The artery is thickened and tender but not pulsatile
- o The patient feel pain during chewing and talking due to ischaemia of masseter muscle

Treatment

Steroid- Tab. Prednisolone 80 mg daily for the first 4–6 weeks, then gradually tapering the dose

Chronic daily headache

- When a patient experiences headache on 15 days or more per month

Causes

Chronic migraine, Chronic tension headache } >4hr
Chronic cluster headache, Chronic paroxysmal hemicranias } <4hr
Post traumatic
Chronic CNS infection
Inflammatory (Giant cell arteritis)
Post infectious

Treatment

- ✓ Tricyclic anti depressant low doses (10–25 mg daily) (amitriptyline 10mg) at night, then to continue
- ✓ If sleep hampers daily activity of the patient, then give it 12 hr before awaken time in the morning or
- ✓ To continue Tab. Flunarizine 10 mg daily at morning

Benign intracranial hypertension

- o Women predominant
- o Obese
- o Present with headache with papilloedema
- o Patient have raised ICP without mass lesion, ventricular dilation and impaired consciousness
- o Some time diplopia and visual disturbance

Investigation

- o The CT is normal, with normal-sized or small ventricle
- o Lumbar puncture– shows raised CSF pressure

Treatment

- o Reduce weight, withdraw medication
- o The carbonic anhydrase inhibitor (acetazolamide) may help to lower intracranial pressure
- o Repeated lumbar puncture can be done
- o In non responding cases, lumbo-peritoneal shunt

Precipitating factor

- o Tetracycline and rarely vitamin A, retinoids
- o Addison's disease
- o Withdrawal of corticosteroid therapy.

16 HYPERTENSION (HTN)

Blood pressure

Blood pressure is the pressure exerted by the blood against the wall of the vessels.

Necessity of blood pressure

Blood pressure keeps the blood flowing through all the branches of the vessels so that the cells of the body can receive the oxygen and nutrients require to sustain life.

Which component of blood pressure is important- SBP or DBP

Both components are important, because treatment target is to control both SBP and DBP. Diastolic hypertension (where SBP is normal) is commonly seen in young age group. With the increase of age SBP increased and DBP gradually decreased, after 50 years SBP is more important in perspective of role in causing cardiovascular disease (CVD).

Physiological variation of blood pressure

1. Blood pressure physiologically increases during and immediately after certain conditions such as exercise, post meal, post coitus, urge of micturition, urge of defaecation, stressful condition, painful condition, taking tea, coffee and smoking etc. (During measurement if blood pressure is high then exclude these conditions within 30 minutes; if any then re-measure blood pressure after 30 minutes)
2. Physiologically blood pressure increases with increasing age
3. Physiologically blood pressure is higher in male than female
4. Blood pressure physiologically decreases during sleep, taking rest

Hypertension

Hypertension is transitory or sustained elevation of systemic arterial blood pressure to a level that is likely to induce cardiovascular damage or other adverse consequences. It has been arbitrarily defined as a systolic blood pressure above 140 mm Hg or a diastolic blood pressure above 90 mm Hg.

Hypertension usually causes no symptoms but in long run can affect the following target organs and leads to certain medical conditions.

1. Heart- causes LVH (left ventricular hypertrophy), CAD (coronary artery disease)
2. Kidney- causes CKD (chronic kidney disease).
3. CNS- stroke, TIA (transient ischaemic attack), carotid atheroma
4. Blood vessels- PAD (peripheral arterial disease)
5. Eyes- hypertensive retinopathy

Diagnostic criteria/ Classification

Blood pressure measurements are classified in stages, according to severity

Table- 16.1 : Classification of hypertension (JNC-7)		
JNC-7 category	SBP (mm Hg)	DBP (mm Hg)
Normal	< 120	< 80
Prehypertension	120-139	80-89
Hypertension	≥ 140	≥ 90
• Stage- I	140-159	90-99
• Stage- II	≥ 160	≥ 100

Primary or essential and secondary hypertension

Aetiologically hypertension can be primary or essential and secondary hypertension. In more than 95% of cases, a specific underlying cause of hypertension cannot be found, such patients are said to have essential hypertension. In about 5% of cases, hypertension can be shown to be a consequence of a specific disease or abnormality, which leads to sodium retention and/or peripheral vasoconstriction, this is secondary hypertension.

Causes of secondary hypertension

1. AGN (acute glomerulonephritis)
2. Thyrotoxicosis
3. Hypothyroidism
4. Pregnancy (pre-eclampsia)
5. Cushing syndrome
6. Polycystic kidney disease
7. Alcohol
8. Renal artery stenosis
9. Coarctation of the aorta
10. Sleep apnoea
11. Pheochromocytoma
12. Drugs- Oral contraceptives containing oestrogens, anabolic steroids, corticosteroids, NSAIDs, carbenoxolone, sympathomimetic agents.

Essential hypertension is usually familial (patient have family history of hypertension) and does not have any cause, but these patients may have some risk factors that lead to hypertension.

Modifiable risk factors of hypertension

1. Smoking and smokeless tobacco (SLT) intake
2. Alcohol intake
3. High salt intake (taking added salt)
4. Physical inactivity or sedentary worker
5. Overweight and obesity including central obesity
6. NSAIDs and steroid intake
7. OCP containing oestrogens
8. Hyperlipidaemia

If modifiable risk factors cannot be identified or removed, then it is difficult to control blood pressure or higher dose of the antihypertensive drug is required to control blood pressure.

Target BP in different subgroup (JNC- 8 recommendations)

Table- 16.2 : Target BP in different subgroup

Patient subgroup	Target SBP (mm Hg)	Target DBP (mm Hg)
≥ 60 years	< 150	< 90
< 60 years	< 140	< 90
> 18 years with CKD		
> 18 years with DM		

For diagnosis of hypertension, following criteria are required:

- Blood pressure should be persistently elevated (≥140/90 mm Hg)
- Persistently elevated evident by
  1. BP should be elevated in more than one measurement and
  2. BP should be elevated in more than one visit

Table- 16.3 : Diagnosis of hypertension (Recommended by Hypertension Canada Guidelines)
At 1st visit diagnose hypertension- if a patient presents with hypertensive urgency or emergency
At 2nd visit diagnose hypertension- if a patient has target organ damage (TOD), DM or BP: SBP ≥ 180 and/or DBP ≥ 110 mm Hg
At 3rd visit diagnose hypertension- if blood pressure persistently SBP ≥ 160 and/or DBP ≥ 100 mm Hg

Table- 16.3 : Continued
At 4th or 5th visit diagnose hypertension- if blood pressure persistently SBP ≥ 140 and/or DBP ≥ 90 mm Hg
(Home BP) Diagnose hypertension- if home blood pressure SBP ≥ 135 and/or DBP ≥ 85 mm Hg
(ABPM) Diagnose hypertension- if awake blood pressure SBP ≥ 135 and/or DBP ≥ 85 mm Hg or average blood pressure SBP ≥ 130 and/or DBP ≥ 80 mm Hg
** ABPM- Ambulatory Blood Pressure Monitoring*

Practically the above-mentioned algorithm cannot be followed in our country due to many reasons (commonly patient related, patient will not follow the follow up schedule). Before diagnosis of hypertension, following points needs to confirm-

1. Blood pressure chronically elevated; raised blood pressure in 2 or more settings/ measurements
2. Not due to transient rise that occurs during urge of micturition, urge of defecation, following meal, following exercise/walking stressful condition or white coat hypertension

Clinical features of hypertension

Usually hypertension is asymptomatic; patient is diagnosed as hypertensive incidentally during consultation for other health problems. However, sometimes patient may complain of headache, neck pain, palpitation etc. When complication of hypertension develops, patient may present with the symptoms of complication. As for example

1. If patient develops CKD then he/she may present with anorexia, vomiting, weakness, oedema/swelling of face
2. If patient develops IHD then he/she may present with chest pain (resting or exertional), palpitation and breathlessness
3. If patient develops stroke then he/she may present with headache, weakness of one side of the body, loss of consciousness
4. If patient develops PAD then he/she may present with claudication (pain in affected leg after walking some distance and relieved after taking rest)

Management of hypertension

2 components of management of hypertension

1. Dietary and life style modifications
2. Pharmacological treatment

Who should offer dietary and life style modifications?

1. In all hypertensive patients (this is the first and cornerstone of hypertension management)
2. In pre-hypertensive patient

Who should offer only dietary and life style modifications (no antihypertensive drug)?

In grade-1 hypertensive patient (SBP 140-159 and/or DBP 90-99) with no target organ damage with low risk of CVD (no DM, no dyslipidaemia, no family history of CAD, PAD, stroke etc). We may follow up the patient for up to 3 months. If the blood pressure is not controlled by this time then antihypertensive should be added.

1. Dietary and lifestyle modifications

A healthy dietary habit and lifestyle are the first line of defense against high blood pressure. Habits that help to control blood pressure include

- Maintain normal body weight (even weight reduction in a patient with normal body weight reduces blood pressure)
- Avoid physical inactivity and sedentary life style
- Regular physical exercise (brisk walking for 30 minutes per day, ideally on most of days of the week)
- Managing stress
- Monitoring blood pressure at home
- Getting support from family and friends
- DASH diet (dietary approach to stop hypertension)
    a. Reduce salt intake to < 100 mmol/day (<6g NaCI day, 1 TSF); avoid taking added salt and high salt containing food
    b. Consume fresh fruits and vegetables daily
    c. Reduce the intake of total and saturated fat
    d. Limit alcohol consumption to < 3 units/day for men and < 2 units/day for women)
    e. Stop smoking and SLT use
    f. Increase intake of potassium, calcium and magnesium containing food

2. Anti hypertensive medications

Who should offer antihypertensive drugs in addition to dietary and life style modifications?

1. Severe hypertension (SBP≥180 mm Hg and/or DBP≥110 mm Hg)
2. Grade 2 hypertension (SBP≥160 mm Hg and/or DBP≥100 mm Hg)
3. Grade 1 hypertension with target organ damage like IHD, stroke, CKD etc
4. Grade 1 hypertension with high risk of CVD

5. Grade 1 hypertension with no TOD with low risk of CVD and blood pressure not controlled despite non-pharmacological measures
6. Grade 2 Isolated systolic hypertension; SBP ≥160 mm Hg and DBP < 90 mm Hg

Anti hypertensive medications

- ❑ There are many different types of blood pressure medication with different modes of action.
- ❑ If one drug does not lower blood pressure enough, another might do the job. For some people, a combination of two or more drugs may be needed to keep blood pressure under control.
- ❑ High blood pressure medications can be divided into the 11 categories listed below, based on how they work. The drugs in each section are just a sampling of what's available.

a) Diuretics

Diuretics, sometimes called water pills, help the kidneys get rid of excess water and salt (sodium). This reduces the volume of blood that needs to pass through the blood vessels and as a result, blood pressure goes down. There are three major types of diuretics defined by how they work. They include:

- Thiazide diuretics
- Potassium-sparing diuretics
- Loop diuretics
- Combination diuretics, which include more than one variety used together

Diuretics in the thiazide group generally have fewer side effects than the others, particularly when taken at the low doses generally used in treating early high blood pressure.

b) Beta-blockers

Beta-blockers help the heart beat with less speed and force. The heart pumps less blood through the blood vessels and blood pressure decreases. There are many drugs within this classification, including:

- Atenolol
- Acebutolol
- Bisoprolol fumarate
- Metoprolol
- Propranolol hydrochloride

c) Angiotensin converting enzyme (ACE) inhibitors

ACE inhibitors help the body produce less of a hormone called angiotensin II, which causes blood vessels to narrow. These medications decrease blood pressure by helping blood vessels expand and let more blood through. Some ACE inhibitors include-

- Ramipril
- Benazepril hydrochloride
- Captopril
- Enalapril maleate
- Fosinopril sodium
- Lisinopril

d) Angiotensin II receptor blockers

This class of drugs also protects the blood vessels from angiotensin II. To tighten blood vessels, the hormone must bind with a receptor site on the blood vessels. These medications keep that from happening. Consequently, blood pressure falls. Angiotensin II receptor blockers include:

- Losartan potassium
- Valsartan
- Candesartan
- Irbesartan
- Telmisartan

e) Calcium channel blockers

Movement of calcium into and out of muscle cells is necessary for all muscle contractions. Calcium channel blockers keep calcium from entering the smooth muscle cells of the heart and blood vessels.

This makes the heart beat less forcefully and helps blood vessels relax. As a result, blood pressure decreases. Examples of these medications include:

- Amlodipine besylate
- Cilnidipine
- Diltiazem
- Isradipine
- Verapamil hydrochloride

f) Alpha-blockers

- ✓ Our body produces a type of hormone called catecholamine when under stress or chronically in some disease states. Catecholamine, along with norepinephrine and epinephrine, cause the heart to beat faster and with more force. And they constrict blood vessels. These effects raise blood pressure and occur when these hormones attach to a receptor.
- ✓ The muscles around some blood vessels have what are known as alpha adrenergic receptors. When catecholamine binds to an alpha receptor, the muscle contracts, the blood vessel narrows and blood pressure rises.

✓ Alpha-blockers prevent binding to alpha receptors, so blood is able to flow through the blood vessels more freely and blood pressure falls. These drugs include:

- Prazosin hydrochloride
- Doxazosin mesylate
- Terazosin hydrochloride

g) Alpha-beta-blockers

Alpha-beta-blockers have a combined effect. They block the binding of catecholamine hormones to both alpha and beta receptors. They can decrease the constriction of blood vessels like alpha-blockers and slow down the rate and force of the heartbeat like beta-blockers. Carvedilol and labetalol hydrochloride are common alpha-beta -blockers.

h) Alpha-2 receptor agonists

- Like other alpha-blockers, these drugs reduce activity in the sympathetic nervous system, which decreases blood pressure. The main biologic difference between them and other alpha-blockers is they target only one type of alpha receptor.
- These are the first choice of treatment of hypertension during pregnancy because they generally pose few risks for the mother and fetus. Methyldopa is a common form of this type of drug.

i) Central agonists

These medications keep the brain from sending messages to the nervous system that would release catecholamines and speed up heart rate and tighten blood vessels. The heart does not pump as hard and blood flows more easily, so blood pressure decreases. These include:

- Alpha methyldopa
- Clonidine hydrochloride
- Guanabenz acetate
- Guanfacine hydrochloride

j) Peripheral adrenergic inhibitors

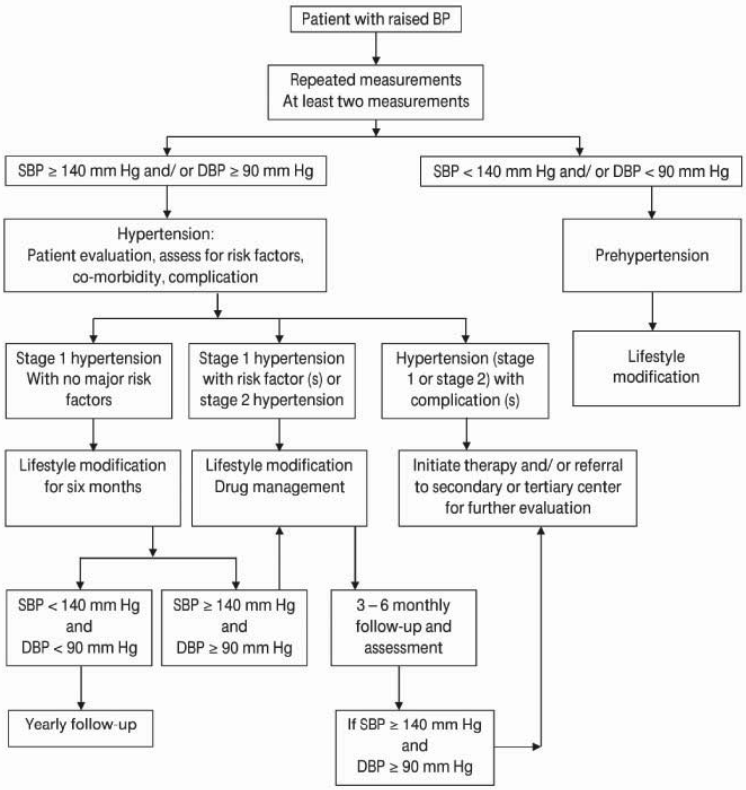
This group of drugs works to block certain chemical messengers inside the brain, which keeps the smooth muscles from getting the message to constrict. These medications are generally used only if other medications are not effective. They include:

- Reserpine
- Guanadrel
- Guanethidine monosulfate

k) Vasodilators

Vasodilators relax the muscles in the walls of blood vessels, especially small arteries (arterioles). This widens the blood vessels and allows blood to flow through them more easily. Blood pressure falls as a result. Hydralazine hydrochloride and minoxidil are examples of vasodilators.

Figure- 16.1 : Principle of management of hypertension



Approach to a patient with hypertension

Table- 16.4 : Approach to a patient with hypertension

History	Physical examination	Investigation
• Age • Family history • Smoking • Smokeless tobacco use • Taking added salt • Dietary pattern • Lifestyle/ activity • Alcohol • OCP • Steroid • DM • IHD • Stroke • CKD • Any other diseases or symptoms	• Eye – Fundoscopy • Eyelid – Xanthelasma – hyperlipidaemia • Face – Cushing • Carotid bruit • Heart –shifting apex beat, AS, gallop • Lungs ---- Basal creps + • BP • Pulse– AF , radio-femoral delay • Other peripheral pulse – PVD • Kidney palpable ---poly cystic kidney • Renal Bruit --- renal artery stenosis • Anaemia and oedema -CRF	• Chest x-ray: to detect ✓ Cardiomegaly, LV type ✓ Coarctation of the aorta ✓ Heart failure – pulmonary oedema • ECG finding ✓ LVH with strain ✓ IHD • S. creatinine • RBS • Urine RME --- proteinuria • Lipid profile • USG to see KUB

Factors need to consider before prescribing antihypertensive drug

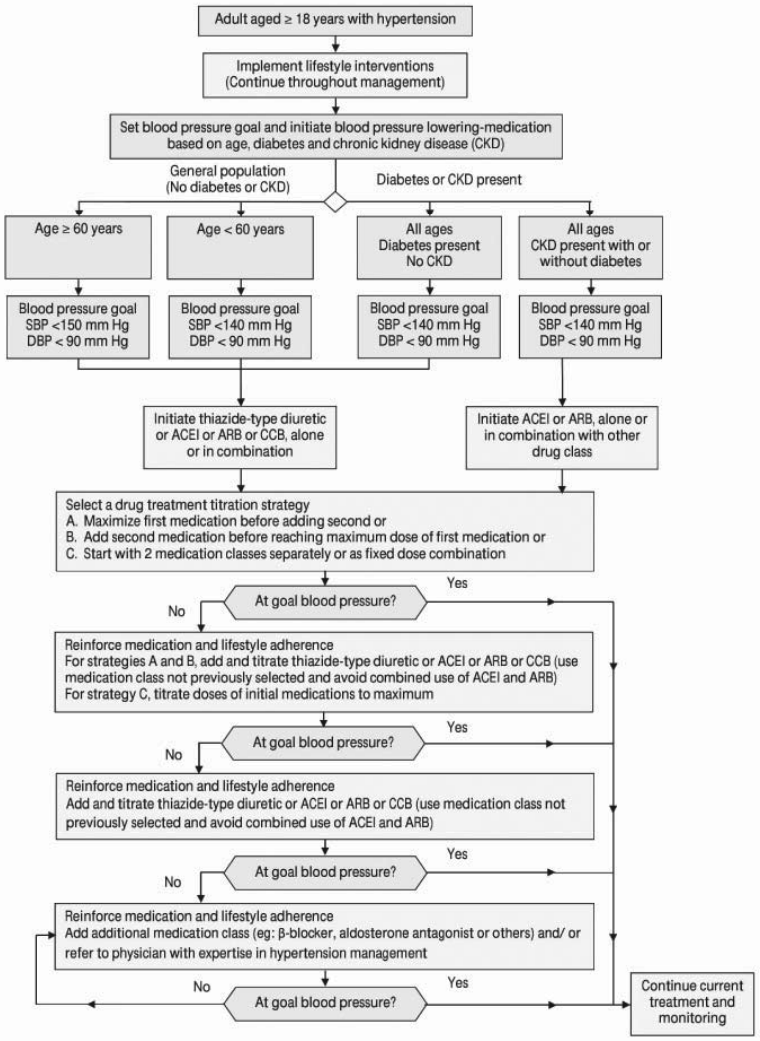
1. **Age of the patient**- antihypertensives that causes postural hypotension better to avoid in old age and beta-blocker that causes impotence, weight gain and hyperglycaemia better to avoid in young patient. Example- ACEI, ARB better to avoid in older age.
2. **Sex of the patient**- ACEI and ARB should be avoided in female patient of reproductive age. Because these drugs are teratogenic.
3. **Predominant symptoms**- if patient complaints of symptoms of sympathetic over activity like palpitation, then choice of antihypertensive should be beta-blocker or rate limiting calcium channel blocker (deltiazem, verapamil). Dihydropyridine calcium channel blockers like amlodipine, nifedipine should be avoided, because these drugs cause tachycardia and palpitation.
4. **Target organ damage**- presence of target organ damage is the cornerstone of selection of antihypertensive therapy. If patient have ischaemic heart disease (angina or MI) then beta-blocker and calcium blocker should be used due to their potential role in IHD (decrease cardiac work load).

5. **Co-morbidity**- ask the patient whether he/ she has asthma, DM, CKD, PAD, pregnancy etc. In asthma patient beta-blocker should be avoided due to its bronchoconstriction effect, choice of drug should be CCB, ARB, diuretic or ACEI. In DM patient it is better to give ARB or ACEI due to its potential role in prevention of progression of diabetic nephropathy. In CKD, ACEI or ARB should be given because of their role on reduction of progression of CKD (except in advanced stage, ACEI and ARB may cause hyperkalaemia and may increase the risk of sudden death). In advanced stage of CKD; CCB, beta-blockers, alpha-blocker, diuretic (frusemide) can be given. In PAD, beta-blockers should be avoided, because beta-blockers cause vasoconstriction and aggravate PAD. In pregnancy ACEI and ARB should be avoided due to its teratogenecity, diuretics should be avoided as it reduce the amount of amniotic fluid. Choices of antihypertensive during pregnancy are alpha methyldopa followed by calcium channel blocker, followed by beta-blockers.
6. **Overweight and obesity**- it is better to avoid beta blocker in overweight and obese patient. Because this drug cause hyperglycaemia and weight gain.
7. **Cost of the antihypertensive drug**- this is very important, because antihypertensive drug usually should be taken for lifelong period, so prescription of low cost drug will increase patient compliance and adherence to drug. Remember "it is not important what drug is patient taking, it is important whether blood pressure is controlled or not."

Basic principles for selection of antihypertensive drugs

- First exclude contraindication
- Then look which one is prefer for coexisting problem
- Never stop beta blocker suddenly– tapper it gradually
- If BP of the patient is controlled with current drug and no other indication then no change of the medication is needed.

Figure- 16.2 : Algorithm of management of hypertension (JNC- 8 modified)



Beta-blockers should not be used as first choice in uncomplicated hypertension. Because-

1. Beta-blocker exert a relatively weak effect in reducing stroke compared to placebo or no treatment
2. Do not have any protective effect with regard to coronary artery disease and compared to other drugs, such as calcium channel blockers, ACE inhibitors or thiazide diuretics, show evidence of worse outcomes, particularly with regard to stroke

How to decide whether single or 2 drug or triple drug should be the initial therapy for newly diagnosed hypertensive patient?

Usually if patient have stage 2 hypertension (BP ≥160/100 mm Hg), he should be started with 2 drug therapy (one should be diuretic). But if patient have severe hypertension ≥180/110 mm Hg, he should start 3 or more drugs

When the dose of the antihypertensive drug should be increased or another drug should be added?

If blood pressure is not controlled after 1 month of starting of antihypertensive drug then dose may be increased or another drug can be added. (Note: antihypertensive drug needs at least 2 weeks time to get maximum effect)

Factors to be checked before increase dose of the antihypertensive drug or add another drug-

1. The patient properly maintained dietary and lifestyle modifications
2. The patient is taking the correct drug with instructed dose (sometimes patient was given wrong drug, with wrong instruction by the pharmacist, sometimes patient change the dose of the drug by themselves)
3. Drugs are taking daily as instructed (some patients used to take the drug only when he/she has symptoms like neck pain, headache, palpitation etc)
4. Patient is not taking other drugs that increase blood pressure e.g. NSAIDs, steroid etc

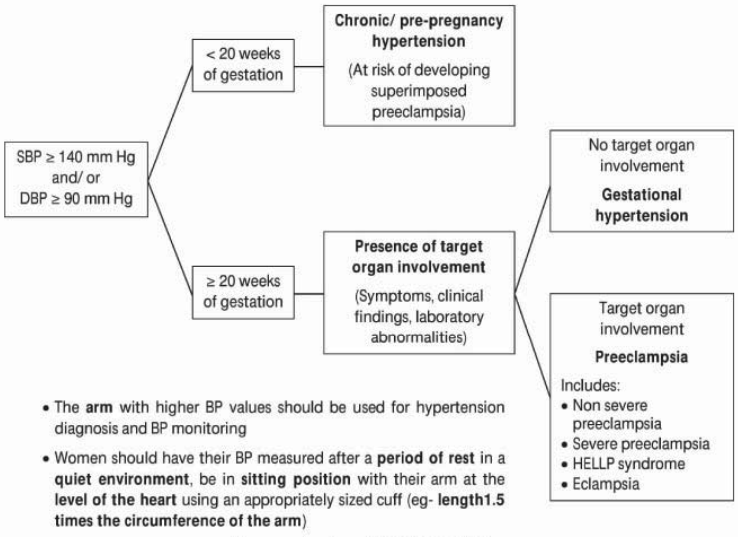
If the above criteria are absent then dose of the drug can be increased or another drug should be added.

Table- 16.5 : Summary of JNC- 8 (modified) recommendations	
Goals	• Age ≥ 60 years, without Diabetes or CKD: ≤ 150/90 mm Hg • All others: < 140/90 mm Hg
Medications	• Initiation- Thiazide-type diuretic, CCB, ACEI or ARB • Age ≥ 18 years with CKD; include ACEI or ARB • Age > 75 years with kidney impairment; CCB and thiazide-type diuretic
Initiation of therapy	• Age ≥ 60 years; SBP ≥ 150 mm Hg or DBP ≥ 90 mm Hg • Age < 60 years; SBP ≥ 140 mm Hg or DBP ≥ 90 mm Hg
Therapy strategies	• Maximize first medication before adding second • Add second medication before reaching maximum dose of first medication • Start with 2 medication classes separately or as fixed-dose combination

Hypertension in special situation

Pregnant women

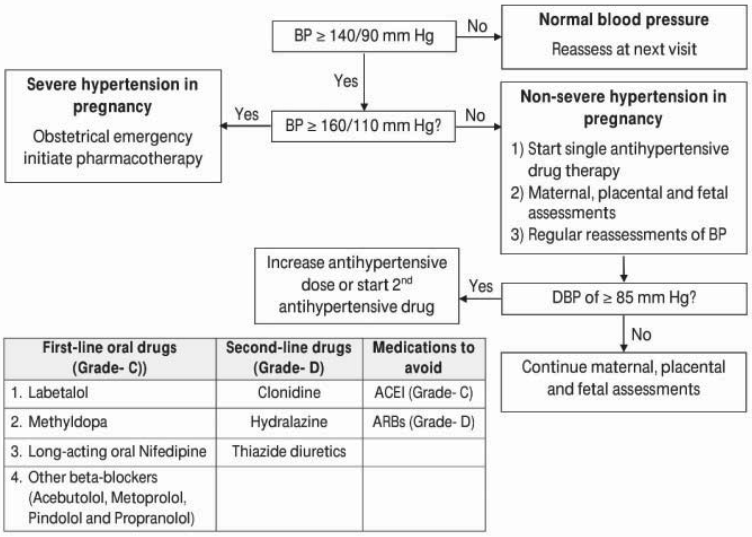
Figure- 16.3 : Hypertensive disorders of pregnancy



- The **arm** with higher BP values should be used for hypertension diagnosis and BP monitoring
- Women should have their BP measured after a **period of rest** in a **quiet environment**, be in **sitting position** with their arm at the **level of the heart** using an appropriately sized cuff (eg- **length1.5 times the circumference of the arm**)

Hypertension Canada's 2018 Guidelines

Figure- 16.4 : Management algorithm of hypertension in pregnancy



First-line oral drugs (Grade- C))	Second-line drugs (Grade- D)	Medications to avoid
1. Labetalol	Clonidine	ACEI (Grade- C)
2. Methyldopa	Hydralazine	ARBs (Grade- D)
3. Long-acting oral Nifedipine	Thiazide diuretics	
4. Other beta-blockers (Acebutolol, Metoprolol, Pindolol and Propranolol)		

Hypertension Canada's 2018 Guidelines

Follow up after delivery

- In women with hypertensive disorder during pregnancy who have given birth, measure blood pressure-
  - ✓ Daily for the first 2 days after birth
  - ✓ At least once between 3rd day and 5th day after birth
  - ✓ Offer a medical review at the postnatal review (6–8 weeks after delivery)
- If a woman has taken methyldopa to treat hypertension during pregnancy, stop within 2 days of birth and restart the antihypertensive treatment the woman was taking before she planned the pregnancy
- Target blood pressure lower than 140/90 mm Hg

Lactating mother

- There is no well-established study assessing transfer of antihypertensive drugs in breast milk

- Neonatal exposure to methyldopa via nursing is likely low and it is generally considered safe, calcium channel blocker transfer into breast milk, apparently without adverse effects. Exposure to labetalol and propranolol seems low. Diuretic seems safe as its concentration is low in breast milk. However, it can reduce the breast milk
- Suggested first line antihypertensive drugs that are safe in breastfeeding mothers include labetalol, nifedipine and enalapril

Hypertension and surgery

- When possible, surgery should be delayed until blood pressure is < 180/110 mm Hg
- Those not on prior drug therapy may be best treated with cardioselective beta-blockers before and after surgery
- Those with controlled blood pressure should continue medication until surgery and begin as soon after surgery as possible

Hypertension and asthma

- Drug of choice is CCB, thiazide diuretics either singly or in combination
- ARB are preferred to ACEI (because ACEI may aggravate dry cough)
- Non selective beta blockers like propanolol must be avoided, selective beta blocker can be used

Resistant hypertension

Resistant hypertension can be defined as "suboptimal blood pressure despite using three antihypertensive agents inclusive of a diuretic and patients who need 4 or more drugs to control blood pressure also called resistant hypertension."

In this situation, the clinician should consider-

- Patients compliance-dietary and lifestyle modifications, drugs taking regularly or not
- Concomitant use of any other drugs like NSAIDs, steroid etc
- Look for sleep disturbances, painful condition in body
- The clinician should see type of diuretic being used in relation to the patient's kidney function
- Aldosterone may play an important role in resistant hypertension and aldosterone receptor blockers (spironolactone) can be very useful
- If goal blood pressure cannot be achieved by these measures, consultation with a hypertension specialist should be considered

Table- 16.6 : Choice of antihypertensive in special situation	
Diseases	**Choice of drugs accordingly**
Diabetes mellitus **(DM)**	**1)** ACE inhibitor/ ARB (Losartan) **2)** Calcium channel blocker **3)** Alpha blocker
Heart failure **(HF)**	**1)** ACE inhibitor/ ARB (Ramipril) **2)** +/- diuretic **3)** Beta blocker- Only Carvedilol
Ischaemic heart diseases **(IHD)**	**1)** Beta blocker (Metoprolol) **2)** ACE inhibitor/ ARB (Ramipril) **3)** Calcium channel blocker (Diltiazem)
Chronic renal failure **(CRF)**	**1)** ACE inhibitor/ ARB (Losartan) **2)** Calcium channel blocker (Amlodipine) **3)** Alpha blocker (Prazosin) **4)** With diuretic **5)** At last beta blocker
Stroke/ **CVD**	**1)** ACE inhibitor/ ARB (Ramipril) **2)** Calcium channel blocker (Amlodipine)
Isolated systolic hypertension	**1)** Calcium channel blocker (Amlodipine) **2)** Diuretic **(**Indepamide)
Peripheral vascular diseases **(PVD)**	**1)** Calcium channel blocker (Amlodipine)
COPD	**1)** Calcium channel blocker (Amlodipine) **2)** ARB (Losartan)
Gout	**1)** ACE inhibitor/ ARB (Ramipril) **2)** Calcium channel blocker (Amlodipine) **3) Contraindication** ▪ Beta blocker ▪ Diuretic

Hypertensive crises

Hypertensive crises are traditionally subdivided in

1. Hypertensive urgencies and
2. Hypertensive emergencies

1. **Hypertensive urgencies**- hypertensive urgency is a hypertensive crises without acute or progressive organ damage and BP should be lowered in 24 – 48 hours to prevent development of acute organ damage. According to JNC- 7, hypertensive urgencies include upper levels of stage- II hypertension with symptoms like headache, dizziness, severe anxiety, epistaxis and shortness of breath.

2. Hypertensive emergencies-

- Severe elevation of BP > 180 / 120 mm Hg complicated by evidence impending or progressive target organ damage
- They require immediate reduction of BP reduction (not necessarily to normal)
- Hypertensive emergency includes-
  - ✓ Hypertensive encephalopathy
  - ✓ Hypertensive LVF
  - ✓ Hypertension with myocardial infarction
  - ✓ Hypertension with UA (Unstable angina)
  - ✓ Hypertension with aortic dissection
  - ✓ Severe HTN with subarachnoid haemorrhage
  - ✓ Crises associated with CVD or Pheochromocytoma
  - ✓ Perioperative hypertension
  - ✓ Use of drugs for addiction- amphetamine, LSD, cocaine
  - ✓ Severe eclampsia, pre-eclampsia

Table- 16.7 : Difference between hypertensive urgency and emergency

Points	Hypertensive urgency	Hypertensive emergency
1. Blood pressure level	DBP >120 to 130 mm Hg	DBP >120 to 130 mm Hg
2. Target organ damage	Absent	Present
3. Symptoms	Asymptomatic	Symptomatic
4. Physical examination	Normal, except high blood pressure	Apart from high blood pressure patient may reveal grade 3 or 4 retinopathy and others findings according to target organ damage
5. Investigation	Normal	Abnormal according to target organ damage
6. Reduction of blood pressure	Rapid reduction of blood pressure not necessary	Rapid reduction of blood pressure is mandatory

Hypertensive encephalopathy

Hypertensive encephalopathy is a rare condition characterized by high blood pressure and neurological symptoms, including transient disturbances of speech or vision, paraesthesiae, disorientation, fits and loss of consciousness. Papilloedema is common. Brain imaging often shows haemorrhage in and around the basal ganglia and a posterior leukoencephalopathy, affecting mainly the white matter of the parieto-occipital regions. However, the neurological deficit is usually reversible if the hypertension is properly controlled.

Malignant/accelerated hypertension

Characterized by accelerated microvascular damage with necrosis in the walls of small arteries and arterioles ('fibrinoid necrosis') and by intravascular thrombosis. The diagnosis is based on evidence of high BP and rapidly progressive end organ damage, such as retinopathy (grade 3 or 4), renal dysfunction (especially proteinuria) and/or hypertensive encephalopathy. For diagnosis of malignant hypertension presence of retinopathy (grade 3 or 4) must be required.

The pathologic hallmark of malignant hypertension is fibrinoid necrosis of the arterioles, which occurs systemically, but specifically in the kidneys. These patients develop fatal complications if untreated and more than 90% will not survive beyond 1-2 years.

Management

1. Hypertensive urgency

Hypertensive urgencies often can be managed with oral medications and appropriate outpatient follow-up in 24 to 72 hours.

For management of the patient during the short interim period, labetalol is effective in a dose of 200 to 300 mg, which can be repeated in 2 to 3 hours and then prescribed in twice-daily dosing. If a beta-blocker is contraindicated, clonidine is effective in an initial dose of 0.1 or 0.2 mg followed by additional hourly doses of 0.1 mg. Patients can be prescribed 0.1 to 0.2 mg twice daily on discharge. Captopril, a short-acting ACE inhibitor, lowers blood pressure within 15 to 30 minutes of oral dosing. A small test dose of 6.25 mg should be used to avoid an excessive fall in blood pressure in hypovolaemic patients; then, the full oral dose is 25 mg, which can be repeated in 1 to 2 hours and prescribed as 25 to 75 mg twice daily

2. Hypertensive emergency

a) Immediate intensive care unit (ICU) admission for intravenous therapy and continuous blood pressure monitoring

b) In most hypertensive emergencies, the goal of parenteral therapy is to achieve a controlled and gradual lowering of blood pressure

c) A good rule of thumb is to lower the initially elevated arterial pressure by 10% in the first hour and by an additional 15% during the next 3 to 12 hours to a blood pressure of no less than 160/110 mm Hg

d) Blood pressure can be reduced further during the next 48 hours. Dose of intravenous antihypertensive drugs are discussed below

Table- 16.8 : Intravenous antihypertensive agents used in hypertensive emergencies

Name of the drugs	Dose
Nitroprusside	Initial 0.3 mg/kg/min; usual 2- 4 mg/kg/min maximum 10 mg/kg/min for 10 min
Nicardipine	Initial 5 mg/hr; titrate by 2.5 mg/hr at 5–15 min interval maximum15 mg/hr
Labetalol	2 mg/min up to 300 mg or 20 mg over 2 min, then 40–80 mg at 10 min interval up to 300 mg total
Enalaprilat	Usual 0.625–1.25 mg over 5 min every 6 8 hr maximum 5 mg/dose
Esmolol	Initial 80–500 mg/kg over 1 min, then 50–300 mg/kg/min
Phentolamine	5–15 mg bolus
Nitroglycerin	Initial 5 mg/min, then titrate by 5 mg/min at 3–5 min interval; if no response is seen at 20 mg/min, incremental increases of 10–20 mg/min may be used
Hydralazine	10–50 mg at 30 min interval

Start with the lowest dose. Subsequent doses and intervals of administration should be adjusted according to the blood pressure response and duration of action of the specific agent.

• ***Weaning from intravenous antihypertensive therapy***

1. After the blood pressure has been brought under acute control, first stop the IV antihypertensive
2. Add oral labetalol or dihydropyridine CCBs, those are particularly useful agents in weaning patients from parenteral therapy
3. A few doses of intravenous frusemide are often needed to overcome drug resistance due to secondary volume expansion resulting from parenteral vasodilator therapy.

• Whether use of sublingual nifedipine is safe in hypertensive emergency?

Excessive reductions in pressure may precipitate coronary, cerebral or renal ischaemia. To avoid such declines, the use of agents that have a predictable, dose-dependent, transient and not precipitous antihypertensive effect is preferable. In that regard, the use of sublingual or oral fast-acting nifedipine preparations is best to avoid.

Prognosis

Severe hypertension is a serious and potentially life-threatening medical condition with a generally poor prognosis. It is estimated that people who do not receive appropriate treatment only live an average of about three years after the diagnosis has been established.

Follow-up

• Who require more frequent follow up?

Patient with severe hypertension, hypertensive urgency require more frequent follow up (after 7 days). Hypertensive emergency patient should be treated in hospital.

• What are the points to be noted during follow up of a hypertensive patient?

1. Ask the patient followings:
    a) Whether he/ she stopped taking added salt, smoking, fatty foods, started exercise regularly, taking fresh fruits and vegetables, taking drug regularly and whether there are any side effects of antihypertensive? Example- dry cough due to ACEI, palpitation due to amlodipine, nifedipine
2. Measure weight in overweight and obese patient (to see weight loss)
3. Measure blood pressure and count the pulse (bradycardia may occur after taking atenolol, deltiazem, tachycardia may occur after taking amlodipine)
4. Blood sugar, serum creatinine, fasting lipid profile, ECG should be repeated at least yearly

Step down therapy

Patients who have had excellent blood pressure control for several years, especially if they have lost weight and initiated favourable lifestyle and dietary modifications, should be considered for "step-down" of therapy (reduce the dose of antihypertensive). However, this must be tried under the guidance of the physician and patient must be in close follow up; patient should not try to do this by themselves.

Criteria of consideration for step down therapy:

1. Patient develops symptoms of hypotension (eg- vertigo when standing from sitting or supine position)
2. BP is persistently below 110/70 mm of Hg.

Table- 16.9 : Common antihypertensives with their doses and common side effects

Antihyper-tensive class	Generic name	Doses	Common side effects
ACEI	Enalapril	Daily at night	Dry cough
	Ramipril	Daily at night	Dry cough
ARB	Losartan potassium	Daily at night	Postural hypotension
	Valsartan	Daily at night	Postural hypotension
	Olmesartan	Daily at night	Postural hypotension
Beta-blockers	Atenolol	Daily at morning	Weight gain, hyperglycaemia
	Bisoprolol	Daily at morning	Safer than atenolol, less metabolic side effects
Calcium channel blockers	Amlodipine	Daily at night	Palpitation, oedema
	Nifedipine	1-3 times daily	Palpitation
	Lacidipine	Daily at morning	Palpitation
	Diltiazem	1-2 times daily	Bradycardia
	Verapamil	1-2 times daily	Bradycardia, constipation
Diuretics	Hydrochlorothiazide and amiloride hydrochloride	Daily at morning	Hyperuricaemia, hyponatraemia
	Frusemide	Daily at morning	Hyponatraemia
	Spironolactone	Daily at morning	Gynaecomastia, hyperkalaemia
Methyldopa	Methyldopa	2 tab; 1 to 4 times daily	Headache, sedation
Carvedilol	Carvedilol (choose in heart failure)	1 to 2 times daily	Bradycardia
Alpha blocker	Prazosin	2 to 3 times daily (maximum 20 mg daily)	Postural hypotension
Alpha-beta blockers	Labetalol	1 to 2 times daily (maximum 800 mg daily)	Postural hypotension

Commonly used antihypertensives: contraindications, indications

ACE Inhibitor / Angiotensive receptor blocker (ARB)

- **Contraindications**
  - Hyperkalaemia
  - Oliguria or ARF
  - In hypovolaemic patient
  - Pregnancy and renal artery stenosis
  - CLD
  - COPD (Angiotensive receptor blocker)
- **Indications**
  - DM
  - CKD
  - CVD
  - Heart failure
  - LV dysfunction/ hypertrophy/ DCM
  - Post MI
- **Side effects**
  - Dry cough
  - Postural hypotension – to avoid it give first dose in night
- Electrolytes and creatinine should be checked **before and 1-2 weeks** after commencing therapy
- **Stop this medication** if:
  - Serum creatinine is increased 25 – 30 % after 1- 2 weeks
  - Patient develops oliguria, hyperkalaemia or deteriorated renal function

Beta-blockers

- **Contraindications**
  - Bronchial asthma/ COPD
  - Heart block/ if pulse less than 60 beats/ min
  - DM
  - Psoriasis
  - PVD
  - Heart failure (can use in Carvedilol compensated heart failure)
- **Indications**
  - Myocardial infarction **(Metoprolol/ Atenolol)**
  - Angina **(Metoprolol/ Atenolol)**
  - Heart failure stable (only **Carvedilol**)
  - Angina **(Metoprolol/ Atenolol)**
  - HTN of young patient without contraindication

- **Before giving** beta blocker see following-
  - History of DM, COPD, asthma, heart failure
  - Auscultate lung for spasm and pulse for bradycardia
- **Why beta-blocker is not used in DM?**
  - It will mask the signs & symptoms of hypoglycaemia (tremor/ tachycardia/ sweating)
  - Can be given cautiously if DM with angina with stable heart failure- **Carvedilol**

Calcium channel blocker

- **Contraindications**
  - Heart block
  - Heart failure
- **Complications**
  - Amlodipine
    a. Flushing, headache
    b. Palpitations
    c. Fluid retention
  - Verapamil
    a. Constipation
  - Verapamil & Diltiazem- may cause bradycardia
- **Indications**
  - Amlodipine
    a. Any patient/ elderly patient without heart failure
    b. Isolated systolic HTN
    c. CRF
    d. COPD/ bronchial asthma
  - Verapamil
    a. Can be useful when hypertension coexists with angina
    b. Verapamil used in SVT

Diuretics

- **Contraindications**
  - DM
  - Gout
  - Hypokalaemia
- **Indications**
  - Isolated systolic HTN
  - In elderly patient
  - In heart failure
  - In renal failure

17 INJURIES/ WOUNDS

Definition

Injury is damage to the body caused by external force. This may be caused by accidents, falls, hits, weapons and other causes. Major trauma is injury that has the potential to cause prolonged disability or death.

A wound is a type of injury which happens relatively quickly in which skin is torn, cut, punctured (an open wound) or where blunt force trauma causes a contusion (a closed wound). In pathology, it specifically refers to a sharp injury which damages the dermis of the skin.

Classification

A. According to level of contamination, a wound can be classified as:

- **Clean wound**- made under sterile conditions where there are no organisms present and the skin is likely to heal without complications
- **Contaminated wound**- usually resulting from accidental injury; there are pathogenic organisms and foreign bodies in the wound
- **Infected wound**- the wound has pathogenic organisms present and multiplying, exhibiting clinical signs of infection (yellow appearance, soreness, redness, oozing pus)
- **Colonized wound**- a chronic situation, containing pathogenic organisms, difficult to heal (eg- bedsore)

B. Wounds can be classified on basis of exposure of the underlying tissues and/or organs, as open and closed wounds

1) Open- Open wounds are wounds with exposed underlying tissue and/or organs that are open to the outside environment. Open wounds can be classified according to the object that caused the wound:

- **Incisions or incised wounds**- caused by a clean, sharp-edged object such as a knife, razor or glass splinter
- **Lacerations**- irregular tear-like wounds caused by some blunt trauma. Lacerations and incisions may appear linear (regular) or stellate (irregular). The term laceration is commonly misused in reference to incisions
- **Abrasions (grazes)**- superficial wounds in which the topmost layer of the skin (the epidermis) is scraped off. Abrasions are often caused by a sliding fall onto a rough surface
- **Avulsions**- injuries in which a body structure is forcibly detached from its normal point of insertion. A type of amputation where the extremity is pulled off rather than cut off
- **Puncture wounds**- caused by an object puncturing the skin, such as a splinter, nail or needle

- **Penetration wounds**- caused by an object such as a knife entering and coming out from the skin
- **Gunshot wounds**- caused by a bullet or similar projectile driving into or through the body. There may be two wounds, one at the site of entry and one at the site of exit, generally referred to as a "through-and-through"

2) Closed- Closed wounds have damage that occurs without exposing the underlying tissue and organs. Closed wounds have fewer categories, but are just as dangerous as open wounds:

- **Haematomas (or blood tumour)-** caused by damage to a blood vessel that in turn causes blood to collect under the skin
  - ✓ Haematomas that originate from internal blood vessel pathology are petechiae, purpura and ecchymosis. The different classifications are based on size
  - ✓ Haematomas that originate from an external source of trauma are contusions, also commonly called bruises
- **Crush injury**- caused by a great or extreme amount of force applied over a long period of time

Petechiae- minute (1 to 2 mm) haemorrhages into skin, mucous membrane or serosal surfaces; associated with thrombocytopenia, platelet dysfunction or locally increased intravascular pressure

Purpura- slightly larger (> 3 mm) haemorrhages; associated with many of the same disorders that cause petechiae or secondary to trauma, vasculitis or increased vascular fragility

Ecchymoses- larger (> 1 to 2 cm) subcutaneous haematomas; haemoglobin (red-blue color) is converted into bilirubin (blue-green color) and eventually into hemosiderin (gold-brown color)

****In all situations, petechiae, ecchymoses, and purpura do not blanch when pressed.*

Management

1. History

- History is important to understand the circumstances of the injury, because mechanism of injury will significantly affect the care provided. An animal bite will require more medical care than a fall on the playground
- It is important to know the circumstances of the injury to decide how dirty the wound might be and whether there are any potential underlying injuries
- Individuals with diabetes, poor circulation, on dialysis or taking medications that can compromise the immune system are at higher risk of infection and the decision to repair a wound may be affected by the patient's medical history

- Tetanus immunization status will be required to determine if immunization is required
- The time frame from when the initial injury occurred and when medical care is sought is also a consideration. The longer a wound is left open, the higher the risk of infection if it is sutured. It is suggested by many health care practitioners that If the wound is older than 6 to 12 hours, it should not be sutured.

2. Physical examination

- The health care provider will make certain that there is no associated injury with the wound (for example, if a person falls on their chin, they may be at risk for a jaw fracture)
- Lacerations of the extremities including legs, arms, feet and hands may involve tendons, nerves and arteries. Assessing their function is an important part of physical examination.

3. Treatment

- Cleaning
- Closure
- Dressings
- Alternative medicine-
  - ✓ Antibiotics as per clinical assumption
  - ✓ NSAIDs for pain
  - ✓ Prophylaxis for tetanus if required

Causes of injury/ trauma

Trauma from all causes, including burns, both intentional and non-intentional.

A) Accident

Accidental injury means an injury that results accidentally or from any external, violent and anticipated causes. For instance, an unexpected and unintentional bodily injury resulting from any external force and against the normal course of events resulting in damage or injury can be categorized as an accidental injury. It is an event that happens by chance or that is without apparent or deliberate cause.

B) Self-harm

Deliberate infliction of tissue damage or alteration to oneself. Examples include self-poisoning, burning and stabbing.

- Inclusion criteria- this category should only be applied if there is no suicidal intent. If suicidal intent is evident the case should be recorded as 'attempted suicide'.

C) Assault (no weapon)

Any intentional physical contact with another person without their consent, with no form of weapon involved.

Other inclusion criteria

- An assault can also occur when a person attempts to assault another or threatens to do so without the consent of the other person

D) Assault (with weapon)

Any intentional physical contact with another person without their consent, with the involvement of a weapon

A weapon includes any foreign object or tool with which force is applied to cause injury (eg: rock, stick, bottle, axe, knife, machete/panga, gun etc).

Other inclusion criteria:

- An assault can also occur when a person attempts to assault another with a weapon or threatens to do so, without the consent of the other person.

18 JAUNDICE / HEPATITIS

Jaundice (Acute Jaundice Syndrome)

Case definition

Any person with

- Acute onset of jaundice (yellowing of whites of eyes or skin or dark urine) **and**
- Severe illness with or without fever **and**
- The absence of any known precipitating factors

Alert thresholds for epidemic-prone conditions commonly included in EWARN

- Five or more cases in one location **or**
- Double the weekly average number of cases seen in the previous 3 weeks for a particular location

** Acute jaundice syndrome (AJS) is an epidemic-prone, water borne disease, with a faecal-oral route of transmission through contaminated water and can be a symptom of different epidemic-prone diseases including hepatitis A, hepatitis E and yellow fever. AJS outbreaks mostly occur in areas where people live in cramped conditions, with poor water supply and insufficient sanitation and hygiene facilities. Hepatitis E viral infection is found as the most common cause for acute jaundice syndrome.

Acute Viral Hepatitis

Definition

Probable case

Any person with

- An acute illness with a discrete onset of any sign or symptom consistent with acute viral hepatitis (eg: fever, headache, malaise, anorexia, nausea, vomiting, diarrhoea, and abdominal pain) **and either**
- Jaundice **or**
- Elevated serum alanine aminotransferase (ALT) or aspartate amino-transferase (AST) levels
- History of contact with acute hepatitis case

Confirmed case

A case that meets the clinical case definition and is laboratory confirmed by

- **Hepatitis A:** IgM anti-HAV- positive
- **Hepatitis B:** IgM anti-HBc- positive (if done) or HBsAg- positive and IgM anti-HAV- negative (if done)

- **Non-A, Non-B Hepatitis:**
  1. IgM anti-HAV- negative **and**
  2. IgM anti-HBc- negative (if done) or HBsAg- negative **and**
  3. Serum aminotransferase levels >2.5 times the upper limit of normal
- **Hepatitis C:**
  1. A positive test for antibodies to hepatitis C virus (anti-HCV)
  2. Hepatitis C virus detection test- Nucleic acid test (NAT) for HCV RNA positive (including qualitative, quantitative or genotype testing)
- **Hepatitis E:**
  1. Detection of hepatitis E virus by nucleic acid testing **or**
  2. Detection of hepatitis E virus in faeces by electron microscopy **or**
  3. IgG seroconversion or a significant increase in antibody level or a four fold or greater rise in titre to hepatitis E virus

Treatment of the acute attack:

- Treatment has little effect in altering the course
- Outcome is unpredictable and all attacks should be treated as potentially fatal and should be insisted upon bed rest with bathroom privileges. This is enforced until the patient is free from jaundice
- Convalescence is not allowed until the patient is symptom-free, the liver no longer tender and the serum bilirubin less than 1.5 mg/dl
- Low-fat, high-carbohydrate diet is popular as most palatable to the anorexic patient
- When the appetite returns, high protein intake may hasten recovery
- The usual diet in hepatitis is composed of the food most appetizing to the patient.

19 KIDNEY RELATED DISEASES

Definition

Kidney disease is a general term for any damage that reduces the functioning of the kidney.

It is a condition that can easily go unnoticed until the symptoms become severe.

The following symptoms are early warning signs that a patient might be developing kidney disease:

- Fatigue- being tired all of the time
- Feeling cold- when others are warm
- Shortness of breath- after very little effort
- Feeling faint, dizzy or weak
- Trouble thinking clearly
- Feeling very itchy
- Swelling in hands or feet
- Swollen or puffy face
- Food tastes like metal
- Ammonia breath
- Upset stomach, nausea, vomiting
- Getting up during the night to make urine
- Foamy or bubbly urine
- Brown, red or purple urine
- Difficulty in micturition

Common kidney diseases

- Chronic kidney disease
- Acute kidney injury
- Glomerulonephritis
- Nephrotic syndrome
- Kidney failure
- Renal stone
- Polycystic kidney disease
- Diabetic nephropathy
- Urinary tract infection
- Urinary tract obstruction
- Renal carcinoma
- Interstitial nephritis

Management of kidney related diseases

Diagnosis

- As a first step toward diagnosis of kidney disease, the patient might be asked about whether the patient is diagnosed with high blood pressure, medications taken that might affect kidney function, any changes in urinary habits and whether having any family members who have kidney disease.
- For kidney disease diagnosis, the patient may also need certain tests and procedures, such as:
  - **a) Blood tests-** Kidney function tests look for the level of CBC, creatinine, electrolytes, urea, eGFR, BUN etc in the blood
  - **b) Urine tests-** Urine RME, CS, 24-hr urinary total protein etc
  - **c) Imaging tests-**
    - ✓ Ultrasound to assess kidneys' structure and size
    - ✓ Other imaging tests may be used in some cases
  - **d) Removing a sample of kidney tissue for testing-** Kidney biopsy is often done with local anaesthesia to help determine what is causing kidney problem

Treatment

- Depending on the underlying cause, some types of kidney disease can be treated, often, though, chronic kidney disease has no cure.
- Treatment usually consists of measures to help control signs and symptoms, reduce complications and slow progression of the disease. If kidneys become severely damaged, the patient may need treatment for end-stage kidney disease.

1. Treating the cause

Physician will work to slow or control the cause of kidney disease. Treatment options vary, depending on the cause. But kidney damage can continue to worsen even when an underlying condition, such as high blood pressure, has been controlled.

2. Treating complications

Kidney disease complications can be controlled to make the patient more comfortable. Treatments may include:

- High blood pressure medications
- Medications to lower cholesterol levels
- Medications to treat anaemia
- Medications to relieve swelling
- Medications to protect bones
- A lower protein diet to minimize waste products in blood
- Medications to treat infection (if any)

3. Treatment for end-stage kidney disease- Dialysis/ kidney transplant

20 MALARIA- CONFIRMED

Definition

Case definition

A suspected case in whom diagnosis is confirmed by

- Presence of asexual form of *Plasmodium sp.* in blood slide examination (BSE) **or**
- Rapid diagnostic test (RDT) +ve for *Plasmodium sp.*

Alert thresholds for epidemic-prone conditions commonly included in EWARN

- Twice the average number of cases seen in the previous 3 weeks for a particular location

Malaria treatment regimen

1. Falciparum malaria (Uncomplicated Malaria-UM)

Artemether+ Lumefantrine combination (ACT) is the drug of choice

Table- 20.1 : Treatment of falciparum malaria (Uncomplicated Malaria - UM) with ACT

Drug	Day	No of dose	Time	5- <15 kg	15- <25 kg	25- <35 kg	≥35 kg
Artemether+ Lumefantrine combination (ACT)	Day- 1	1st	0 hour	1	2	3	4
		2nd	8 hour	1	2	3	4
	Day- 2	3rd	24 hour	1	2	3	4
		4th	36 hour	1	2	3	4
	Day- 3	5th	48 hour	1	2	3	4
		6th	60 hour	1	2	3	4

Alternative treatments (if ACT cannot be given then)

- Quinine 7 days + Tetracycline 7 days (Q7 + T7) **or**
- Quinine 7 days + Doxycycline 7 days (Q7 + D7) **or**
- Quinine 7 days + Clindamycin 7 days (Q7 + Clin7) **or**
- Other WHO recommended ACTs (eg- Artesunate- Mefloquine, Artesunate- Amodiaquine) when available

✓ Tetracycline and Doxycycline are contraindicated in children younger than 8 years old and in pregnant and lactating women

✓ The ACTs and Quinine + Tetracycline/ Doxycycline/ Clindamycin can be alternatively used if there is failure of any regimen

✓ Doses of alternative medicines

- Tetracycline- 250 mg 6 hourly for 7 days
- Doxycycline- 100 mg once daily for 7 days

- Clindamycin- 10 mg/kg twice daily for 7 days
- Quinine is to be given at a dose of 10 mg/ kg body weight 8 hourly for 7 days. The calculated dose for adults and children are given in table- 20.2.

Table- 20.2 : Dosages of quinine tablets

Weight in kg	No of quinine (300mg) tab (given TDS)	Duration of treatment
3 – 9	¼	7 days
10 – 19	½	
20 – 29	1	
30 – 39	1½	
≥ 40	2	

Use of gametocytocidal drugs to reduce transmission

- A single oral dose of 0.75 mg base/kg body weight primaquine [45 mg base (3 tab) maximal for adults] is to be added at the beginning of the treatment regime to eliminate gametocytes and thus reduce transmission.
- Primaquine should not be given in pregnancy and in children less than 4 years old.

2. Falciparum malaria (Severe Malaria- SM)

A. Pre-referral treatment

- IM Quinine- 20 mg salt/kg stat IM with half dose in each thigh **or**
- Artesunate rectal capsule- 10 mg/kg (rectal capsules containing 100 mg or 400 mg of Sodium Artesunate).
- Immediate referral should be made to the nearest health facility where parental treatment is available

B. Hospital treatment

- IV Artesunate will be preferred antimalarial for SM when available **or**
- IV Quinine drip (if IV Artesunate are not available) **or**
- IM Artemether (it is effective as that of Quinine but not superior to IV Artesunate due to erratic absorption) **or**
- IM Quinine can also be given
- Loading dose of quinine should be given

✓ **Parenteral treatment regime (dose)**

a) IV Artesunate- 2.4 mg/kg stat followed by 2.4 mg/kg daily until the patient can tolerate oral medication **or**

b) IV Quinine dihydrochloride- 20mg salt/kg stat followed by 10mg/ kg/ 8 hourly. This may be given by slow intravenous infusion, no faster than 50 mg/kg/hour **or**

c) IM Artemether- 3.2 mg/kg stat followed by 1.6 mg/kg daily until the patient can tolerate oral medication **or**

d) IM injection to the anterior thigh diluted 1:1 in sterile water for injection (the first 20 mg/kg dose is splitted; 10 mg/kg to each thigh

C. Follow on treatment

- Following initial parenteral treatment, once the patient can tolerate oral therapy
- It is essential to continue and complete treatment with an effective oral antimalarial using a full course of an effective ACT or Artesunate (plus Clindamycin or Doxycycline) or Quinine (plus Clindamycin or Doxycycline)
- Doxycycline is preferred to other tetracyclines because it can be given once daily and does not accumulate in renal failure.
- Clindamycin may be substituted in children and pregnant women; Doxycycline cannot be given to these groups

D. Use of gametocytocidal drugs to reduce transmission

- A single oral dose of 0.75 mg base/kg body weight primaquine [45 mg base (3 tab) maximal for adults] is to be added at the beginning of the treatment regime to eliminate gametocytes and thus reduce transmission.
- Primaquine should not be given in pregnancy and in children less than 4 years old.

3. Vivax malaria (VM)

- **Chloroquine 3 days + Primaquine 14 days (CQ3 + PQ14)**
  - ✓ **Dose schedule-**
    - o **Chloroquine (CQ):**
      - 1st day- 10 mg/kg (4 tabs for adult)
      - 2nd day- 10 mg/kg (4 tabs for adult)
      - 3rd day- 5 mg/kg (2 tabs for adult)
    - o **Primaquine (PQ):**
      - 1 tab daily for 14 days in adults (1 tab- 15 mg)
      - 0.3 mg/kg daily for 14 days in children

Malaria in pregnant and lactating women

1. Falciparum malaria (Uncomplicated Malaria- UM)

First trimester

- Quinine plus Clindamycin to be given for 7 days (to preserve Quinine sensitivity it is advisable not to use Quinine monotherapy but when Clindamycin is not available or unaffordable, Quinine monotherapy for 7 days should be given)
- An ACT is indicated if
  - This is the only treatment immediately available **or**
  - Treatment with 7 days Quinine plus Clindamycin fails **or**
  - Uncertainty of compliance with a 7 day treatment

Second and third trimesters-

- ACTs or Quinine plus Clindamycin to be given for 7 days.

Lactating women-

- Lactating women should receive standard antimalarial treatment (including ACTs) except for Primaquine, Tetracycline and Doxycycline.

2. Falciparum malaria (Severe Malaria- SM)

- IV Artesunate is preferred antimalarial (over Quinine) for SM in second and third trimester
- In first trimester both IV Artesunate and IV Quinine may be considered as options
- If IVQ/ IMQ is used, loading dose of quinine should be given
- Quinine is safe in all trimester of pregnancy

3. Vivax malaria (VM)

- Chloroquine is safe in all trimester of pregnancy
- Primaquine should be avoided in pregnancy and lactation
- During pregnancy if the patient develops recurrent attack of vivax malaria, Chloroquine can be given in every episode of illness
- Chloroquine is still highly sensitive and effective in vivax malaria
- Radical cure can be done later

21 MALARIA- SUSPECTED

Definition

1. Uncomplicated (falciparum) malaria (UM)/ vivax malaria (VM)

A person with-

- Fever or history of fever within last 48 hours **and**
- Absence of convincing evidence of any other febrile illness
- High index of suspicion based on time, place and person (Endemic zone/ history of travelling in an endemic zone; susceptible population; transmission season etc.)

2. Severe malaria (SM)

A person with-

- Fever or history of fever within last 48 hours **and**
- Absence of convincing evidence of any other febrile illness **and**
- One or more of the following clinical[1] or lab[2] features of severity **and**
- High index of suspicion based on time, place and person (Endemic zone/ history of travelling in an endemic zone; susceptible population; transmission season etc.)

1) Clinical features:

- Change of behaviour, confusion or drowsiness
- Altered consciousness or coma (Cerebral malaria)
- Generalized convulsions > 2 episodes in 24 hours
- Difficulty in breathing due to acute pulmonary oedema or acute respiratory distress syndrome (ARDS) or deep breathing (acidotic breathing)
- Circulatory collapse or shock (algid malaria) (< 70 mm Hg in adults and < 50 mm Hg in children)
- Clinical jaundice
- Severe prostration, eg- extreme generalized weakness so that patient cannot walk, stand or sit without assistance and in small children failure to feed
- Severe vomiting leading to non per os
- Bleeding tendency or abnormal spontaneous bleeding
- Severe anaemia
- Oliguria or acute renal failure (< 17 ml/hr or < 400 ml/24hrs)

2) Laboratory findings:

- Hypoglycaemia (< 2.2 mmol/L or < 40 mg/dl)
- Severe normocytic anaemia (Hb < 5 gm/dl, PCV < 15%)
- Fluid and electrolyte disturbance (Hyponatraemia)
- Haemoglobinuria
- Hyperparasitaemia (> 5% or 250000/microlitre)
- Metabolic acidosis (plasma bicarbonate < 15 mmol/L)
- Hyperlactataemia (> 5 mmol/L)
- Renal impairment (serum creatinine > 265 micromol/L or > 3 mg/dl)

22 MEASLES/ RUBELLA- SUSPECTED

Measles

Definition

Clinical description

An acute illness characterized by:

- Generalized, maculopapular rash lasting ≥3 days **and**
- Temperature ≥101°F or 38.3°C **and**
- Cough, coryza or conjunctivitis.

Case classification

Probable case

In the absence of a more likely diagnosis, an illness that meets the clinical description with:

- No epidemiologic linkage to a laboratory-confirmed measles case **and**
- Noncontributory or no measles laboratory testing.

Confirmed case

An acute febrile rash illness[1] with

- Confirmed by any one of the laboratory confirmation tests*
- Direct epidemiologic linkage** to a confirmed case

Alert thresholds for epidemic-prone conditions commonly included in EWARN

- One case

*** Laboratory confirmation by-**

- Isolation of measles virus[2] from a clinical specimen **or**
- Detection of measles-virus specific nucleic acid[2] from a clinical specimen using polymerase chain reaction **or**
- IgG seroconversion[2] or a significant rise in measles immunoglobulin G antibody[2] using any evaluated and validated method **or**
- A positive serologic test for measles immunoglobulin M antibody[2,3]

1) *Temperature does not need to reach ≥101°F/ 38.3°C and rash does not need to last ≥3 days*
2) *Not explained by MMR vaccination during the previous 6-45 days*
3) *Not otherwise ruled out by other confirmatory testing or more specific measles testing in a public health laboratory*

****An epidemiological link is established when there is-**

1. Contact between two people involving a plausible mode of transmission at a time when:
   - one of them is likely to be infectious (approximately five days before to four days after rash onset) **and**
   - the other has an illness that starts within 7 to 18 (usually 10) days after this contact **and**
2. At least one case in the chain of epidemiologically linked cases (which may involve many cases) is laboratory confirmed.

Measles patients are classified as

- Severe complicated measles
- Complicated measles
- Uncomplicated measles

Table- 22.1 : Clinical features of measles

Severe complicated measles	*Complicated measles*	*Uncomplicated measles*
• Not able to drink or breastfeed* • Convulsions* • Lethargic or unconscious* • Deep or extensive mouth ulcers • Chest indrawing and rapid breathing • Stridor in a calm child • Corneal clouding or ulcers or vision affected • Mastoiditis- pain and swelling of the bone behind the ear • Severe malnutrition • Severe dehydration **Key: * danger signs**	• Rapid breathing, but no chest indrawing - 50 or more breaths per minute if aged less than 1 year - 40 or more breaths per minute if aged more than 1 year • Some dehydration • Stridor only when the child is upset or crying • Mouth ulcers not affecting intake of food or fluids • Pus draining from the eyes • Acute otitis media- pain in or discharge from the ear, duration less than 14 days	If a child with measles has no signs or symptoms suggesting severe complicated or complicated measles, classify as **uncomplicated measles**

Where to manage cases

- Severe complicated measles - **hospital**
- Complicated measles - **outpatient clinic**
- Uncomplicated measles - **home care**

Principles of management

- Treat the whole child (and family)
- Treat multiple complications at the same time
- Anticipate complications
- Act fast to treat eye lesions

Management

1) **Plenty of fluids and liquids**- Usually water, fruit juice, milk etc helps. Patients are advised to avoid soft sugary drinks and caffeine rich drinks
2) For fever, aches and pains, **paracetamol or ibuprofen** is prescribed. For children under the age of 16 years aspirin should not be given.
3) Patients should be kept in a **closed and darkened room** to ease the sensitivity to light and reduce eye discomfort
4) There may be secretions and dried off crusts around the eyes. These can be eased by using **damp, sterile cotton wool**
5) Usually a cough is present in patients and children with measles. **Cough medications,** however, are of little or no help and usually not advised in children under the age of 6 years. Children over 12 months old may be benefited from a teaspoon of lemon juice and two teaspoons of honey in a glass of warm water. This will soothe the throat. Honey should not be given to babies under the age of 12 months for risk of a severe form of paralysis
6) **Local skin moisturizers** are prescribed in case of itchy rash. The rash is usually non-itchy and this may not be required
7) **Vitamin A supplements** may prevent some of the serious complications arising from a measles infection
8) **Antibiotics** are of no help in treating a viral infection. However, these may be prescribed to treat any secondary bacterial infections
9) In severe cases of measles, especially with complications, **hospital treatment** may be required

Reasons for hospital admission

- Not able to drink/breastfeed*
- Convulsions*
- Abnormally sleepy or difficult to wake*
- Deep or extensive mouth ulcers
- Chest indrawing and rapid breathing
- Stridor in calm child

- Corneal clouding or ulcers or vision affected
- Mastoiditis
- Severe dehydration
- Severe malnutrition

Key: * danger signs

Prevention of measles

A. Vaccination

- Children 12 months of age or older should have 2 doses, separated by at least 28 days.
- As per EPI schedule of Bangladesh, children should have 1 dose of **MR** vaccine after completion of **9 months**, then another 1 dose after completion of **15 months** of age
- Adolescents and adults who have not had measles or have not been vaccinated should get 2 doses, separated by at least 28 days
- Two doses of MMR (measles, mumps & rubella) vaccine is nearly 100% effective at preventing measles.

B. Practice hygiene and cleanliness:

- Wash hands often
- If soap and water are not available, clean hands with hand sanitizer (containing at least 60% alcohol)
- Do not touch eyes, nose or mouth. If need to touch face, make sure hands are clean
- Cover mouth and nose with a tissue or sleeve (not hands) when coughing or sneezing
- Try to avoid close contact, such as kissing, hugging or sharing eating utensils or cups, with people who are sick.

Rubella (German measles)

Definition

Suspected case

Any generalized rash illness of acute onset that does not meet the criteria for probable or confirmed rubella or any other illness.

Probable case

In the absence of a more likely diagnosis, an illness characterized by all of the following:

- Acute onset of generalized maculopapular rash **and**
- Temperature greater than 99.0° F or 37.2° C, if measured **and**
- Arthralgia, arthritis, lymphadenopathy or conjunctivitis **and**
- Lack of epidemiologic linkage* to a laboratory-confirmed case of rubella **and**
- Noncontributory or no serologic or virologic testing.

Confirmed case

A case with or without symptoms who has laboratory evidence of rubella infection confirmed by one or more of the following laboratory tests:

- Isolation of rubella virus **or**
- Detection of rubella-virus specific nucleic acid by polymerase chain reaction **or**
- IgG seroconversion[1] or a significant rise between acute and convalescent phase titers in serum rubella IgG antibody level by any standard serologic assay **or**
- Positive serologic test for rubella IgM antibody[1,2]

OR

An illness characterized by all of the following:

- Acute onset of generalized maculopapular rash **and**
- Temperature greater than 99.0°F or 37.2°C **and**
- Arthralgia, arthritis, lymphadenopathy or conjunctivitis **and**
- Epidemiologic linkage* to a laboratory-confirmed case of rubella.

1) *Not explained by MMR vaccination during the previous 6-45 days.*
2) *Not otherwise ruled out by more specific testing in a public health laboratory.*

*** An epidemiological link is established when there is-**

1. Contact between two people involving a plausible mode of transmission at a time when:
   - One of them is likely to be infectious (about one week before to at least four days after appearance of rash) **and**
   - The other has an illness which starts within 14 and 23 days after this contact **and**
2. At least one case in the chain of epidemiologically linked cases (which may involve many cases) is laboratory confirmed.

Diagnosis of rubella (German measles)

Since German measles appears similar to other viruses that cause rashes, diagnosis is confirmed by blood test. This can check for the presence of different types of rubella antibodies in blood. The test results can indicate whether a person currently has the virus or is immune to it.

Rubella (German measles) in pregnant women

When a woman contracts German measles during pregnancy, the virus can be passed on to her developing baby through her bloodstream. This is called **congenital rubella syndrome**. Congenital rubella syndrome is a serious health concern, as it can cause-

- Miscarriages and stillbirths

It can also cause birth defects in babies, who are carried to term, including:

- Delayed growth
- Intellectual disabilities
- Heart defects
- Deafness
- Poorly functioning organs

Women of childbearing age should have their immunity to rubella tested before becoming pregnant. If a vaccine is needed, it is important to get it at least 28 days before trying to conceive.

Treatment

- No treatment will shorten the course of rubella infection and symptoms are so mild that treatment usually is not necessary
- Doctor may suggest the patient to rest in bed and to take acetaminophen, which can help relieve discomfort from fever and aches
- Isolation is recommended from others; stay home from work or school to prevent spreading the virus to others; especially pregnant women during the infectious period
- It is also recommended that pregnant women may be treated with antibodies, **hyperimmune globulin**. This can help reducing symptoms. However, there is still a chance that the baby will develop congenital rubella syndrome
- Babies who are born with congenital rubella will require treatment from specialists

Prevention

- For most people, vaccination is a safe and effective way to prevent rubella. The vaccine is typically combined with vaccines for the measles and mumps
- These vaccines are usually given to children who are between 12 and 15 months old
- As per EPI schedule of Bangladesh, children should have 1 dose of **MR** vaccine after completion of **9 months**, then another 1 dose after completion of **15 months** of age
- A booster shot will be needed again when children are between ages 4 and 6 years. Since the vaccines contain small doses of the virus, mild fevers and rashes may occur

If a person does not know whether he/she has been vaccinated for German measles, it is important to have his/her immunity tested, especially if he/she

- Is a woman of childbearing age and are not pregnant
- Attends an educational facility
- Works in a medical facility or school
- Plans to travel to a country that does not offer immunization against rubella

While the rubella vaccine usually is not harmful, the virus in the shot could cause adverse reactions in some people. A person should not be vaccinated if he/she has a weak immune system due to another illness, is pregnant or plans to become pregnant within the next month.

23 MENINGITIS- SUSPECTED

Definition

Case definition

- Any person with sudden onset of fever (>38.0 °C axillary) **and** one of the following signs:
  1. Neck stiffness
  2. Altered consciousness
  3. Petechial or purpural rash
  4. Other meningeal signs (severe neck stiffness causing the patient's hip and knees to flex when the neck is flexed- ***Brudzinski's sign;*** severe stiffness of the hamstrings causing inability to straighten the leg when the hip is flexed 90 degrees- ***Kernig's sign***)
- In children < 1 year, meningitis is suspected when fever is accompanied by a bulging fontanelle

Alert thresholds for epidemic-prone conditions commonly included in EWARN

- One case in a crowded camp setting **or**
- In endemic countries of the meningitis belt
  - ✓ Population > 30,000- five cases per 100,000 people per week
  - ✓ Population < 30,000- two cases per week

Causes of meningitis

Table- 23.1 : Causes of meningitis

A. Infective		
	1. Bacteria	
Age of onset	**Common**	**Less common**
Neonate	Gram-negative bacilli (*Escherichia coli, Proteus*) Group B *Streptococci*	*Listeria monocytogenes*
Pre-school child	*Haemophilus influenzae* *Neisseria meningitidis* *Streptococcus pneumoniae*	*Mycobacterium tuberculosis*
Older child and adult	*Neisseria meningitidis* *Streptococcus pneumoniae*	*Listeria monocytogenes* *Mycobacterium tuberculosis* *Staphylococcus aureus* (skull fracture) *Haemophilus influenzae*

Table-23.1 : Continued	
2. Viruses	
• Enteroviruses (Echo, Coxsackie, Polio)	• Epstein-Barr
• Mumps	• HIV
• Influenza	• Lymphocytic choriomeningitis
• Herpes simplex	• Mollaret's meningitis (herpes simplex virus type 2)
• Varicella zoster	
3. Protozoa and parasites	
• Cysticerci	• Amoeba
4. Fungi	
• *Cryptococcus neoformans*	• *Blastomyces*
• *Candida*	• *Coccidioides*
• *Histoplasma*	• *Sporothrix*
B. Non-infective (sterile)	
1. Malignant disease	
• Breast cancer	• Leukaemia
• Bronchial cancer	• Lymphoma
2. Inflammatory disease (may be recurrent)	
• Sarcoidosis	• Behcet's disease
• SLE	

Risk Factors for meningitis

The following are some of the risk factors for meningitis:

a) Compromised immunity

People with an immune deficiency are more vulnerable to infections. This includes the infections that cause meningitis. Certain disorders and treatments can weaken immune system. These include:

- HIV/ AIDS
- Autoimmune disorders
- Chemotherapy
- Organ or bone marrow transplants

Cryptococcal meningitis, which is caused by a fungus, is the most common form of meningitis in people with HIV or AIDS

b) Community living

Meningitis is easily spread when people live in close quarters. Being in small spaces, increase the chance of exposure. Examples of these locations include:

- College dormitories
- Barracks
- Boarding schools
- Day care centers

c) Pregnancy

Pregnant women have an increased risk of listeriosis, which is an infection caused by the *Listeria* bacteria. Infection can spread to the unborn child

d) Age

All ages are at risk for meningitis. However, certain age groups have a higher risk. Children under the age of 5 years are at increased risk of viral meningitis. Infants are at higher risk of bacterial meningitis

e) Working with animals

Farm workers and others who work with animals have an increased risk of infection with *Listeria monocytogenes*

f) Travel

Travelers may be at increased risk for meningococcal disease, caused by *N. meningitidis*, if they travel to certain places, such as:

- The meningitis belt in sub-Saharan Africa, particularly during the dry season
- Mecca during the annual Hajj and Umrah pilgrimage

How meningitis spread

1. Bacterial meningitis

Bacterial meningitis spread from one person to another. How people spread the germs of often depends on the type of bacteria

- Certain germs, such as ***Listeria monocytogenes,*** can spread through food
- Mothers can pass **Group B *Streptococcus*** and ***Escherichia coli*** to their babies during labour and birth
- People spread ***Haemophilus influenzae*** (type-b) and ***Streptococcus pneumoniae*** by coughing or sneezing while in close contact with others, who breathe in the bacteria
- People spread ***Neisseria meningitidis*** by sharing respiratory or throat secretions (saliva or spit). This typically occurs during close (coughing or kissing) or lengthy (living in the same household) contact
- People can get ***Escherichia coli*** by eating food prepared by people who did not wash their hands well after using the toilet

2. Viral meningitis

Only a small number of people who get infected with the viruses that cause meningitis will actually develop viral meningitis. Viruses that can cause meningitis spread in different ways

- **Non-polio enteroviruses** can be found in an infected person's faeces (stool), eye, nose and mouth secretions (such as saliva, nasal mucus or sputum), blister fluid. One can get exposed to the virus by-

- ✓ Having close contact, such as touching or shaking hands, with an infected person
- ✓ Touching objects or surfaces that have the virus on them, then touching eyes, nose or mouth before washing hands
- ✓ Changing diapers of an infected person, then touching eyes, nose or mouth before washing hands
- ✓ Drinking water that has the virus in it
- ✓ Pregnant women who are infected with a non-polio enterovirus shortly before delivery can pass the virus to their babies

- **Mumps** spreads through saliva or mucus from the mouth, nose or throat. An infected person can spread the virus by
  - ✓ Coughing, sneezing or talking
  - ✓ Sharing items, such as cups or eating utensils with others
  - ✓ Touching objects or surfaces with unwashed hands that are then touched by others
- **EBV** spreads most commonly through body fluids, especially saliva. It can also spread through blood and semen during sexual contact, blood transfusions and organ transplantations. EBV can also be spread by using objects, such as a toothbrush or drinking glass, that an infected person recently used
- **Measles** is a highly contagious virus that lives in the nose and throat mucus of an infected person. It can spread to others through coughing and sneezing. If other people breathe the contaminated air or touch the infected surface, then touch their eyes, noses or mouths, they can become infected
  - ✓ Measles is so contagious that if one person has it, 90% of the people close to that person who are not immune will also become infected
  - ✓ Measles is a disease of humans; measles virus is not spread by any other animal species
- **Flu viruses** are spread mainly by droplets made when people with flu cough, sneeze or talk. Less often, a person might also get flu by touching a surface or object that has flu virus on it and then touching their own mouth or nose
- **Arboviruses** (spread through mosquitoes and other insects)
- **Lymphocytic choriomeningitis** infections can occur after exposure to fresh urine, droppings, saliva or nesting materials from infected rodents. Transmission may also occur when these materials are directly introduced into broken skin, the nose, the eyes or the mouth or presumably, via the bite of an infected rodent. Person-to-person transmission has not been reported, with the exception of vertical transmission from infected mother to fetus and rarely, through organ transplantation

3. Fungal meningitis

Fungal meningitis can develop after a fungus spreads through the bloodstream from somewhere else in the body to the brain or spinal cord or from an infection next to the brain or spinal cord. One may also get fungal meningitis after taking medications that weaken immune system. Examples of these medications include **steroids (such as prednisone)**, medications given after organ transplantation or **anti-TNF medications,** sometimes given for treatment of rheumatoid arthritis or other autoimmune conditions.

Different types of fungus are transmitted in several ways-

- ***Cryptococcus*** is thought to be acquired through inhaling soil contaminated with bird droppings
- ***Histoplasma*** is found in environments with heavy contamination of bird or bat droppings
- ***Blastomyces*** is thought to exist in soil rich in decaying organic matter
- **Coccidioides** is found in the soil of endemic areas (Southwestern US and parts of Central and South America).
- Unlike the fungi above, ***Candida***, which can also cause meningitis, is usually acquired in a hospital setting.

Symptoms of meningitis

The symptoms of viral and bacterial meningitis can be similar in the beginning. However, symptoms of bacterial meningitis are usually more severe. The symptoms also vary depending on age

Table- 23.2 : Clinical features of meningitis

Bacterial	Viral	Fungal
• Altered mental status • Nausea • Vomiting • Sensitivity to light • Irritability • Headache • Fever • Stiff neck	**Common symptoms in babies** • Fever • Irritability • Poor eating • Sleepiness or trouble waking up from sleep • Lethargy (a lack of energy) **Common symptoms in adults** • Fever • Headache • Stiff neck • Sensitivity to bright light • Sleepiness or trouble waking up from sleep • Nausea • Vomiting • Lack of appetite • Lethargy (a lack of energy)	• Fever • Headache • Stiff neck • Nausea and vomiting • Photophobia (sensitivity to light) • Altered mental status (confusion)

Table- 23.3 : Clinical features and staging of tuberculous meningitis	
Symptoms	
• Headache • Vomiting • Low-grade fever • Lassitude	• Depression • Confusion • Behaviour changes
Signs	
• Meningism (may be absent) • Oculomotor palsies • Papilloedema	• Depression of conscious level • Focal hemisphere signs
Staging of severity	
• Stage- I (early): non-specific symptoms and signs without alteration of consciousness • Stage- II (intermediate): altered consciousness without coma or delirium + minor focal neurological signs • Stage- III (advanced): stupor or coma, severe neurological deficits, seizures or abnormal movements	

Complications of meningitis

These complications are typically associated with meningitis:

- Seizures
- Hearing loss
- Brain damage
- Hydrocephalus
- A subdural effusion, or a buildup of fluid between the brain and the skull

Diagnosis

Diagnosing meningitis starts with a health history and physical examination. Age, dorm residence and day care center attendance can be important clues. During the physical examination, doctor will look for:

- Fever
- Increased heart rate
- Neck stiffness
- Reduced consciousness

The doctor will order a lumbar puncture for **CSF study**. This test is also called a **spinal tap**. It allows doctor to look for increased pressure in the central nervous system. It can also find inflammation or bacteria in the spinal fluid. This test can also help to determine the best antibiotic for treatment

Table- 23.4 : CSF findings in different meningitis					
Condition	**Cell type**	**Cell count (per mm^3)**	**Glucose**	**Protein**	**Gram stain**
Normal	Lymphocytes	0 – 4	>60% of blood glucose	Up to 0.45 gm/L	(-)
Viral	Lymphocytes	10 – 2000	Normal	Normal	(-)
Bacterial	Polymorphs	1000 – 5000	Low	Normal or elevated	(+)
Tuberculous	Polymorphs/ Lymphocytes/ mixed	50 – 5000	Low	Elevated	Often (-)
Fungal	Lymphocytes	50 – 500	Low	Elevated	+ / -
Malignant	Lymphocytes	0 – 100	Low	Normal or elevated	(-)

Other tests may also be ordered to diagnose meningitis. Common tests include the following:

- **Blood cultures** identify bacteria in the blood. Bacteria can travel from the blood to the brain. *N. meningitidis* and *S. pneumoniae* can cause both sepsis and meningitis
- A **complete blood count** with differential is a general index of health. It checks the number of red and white blood cells in blood. White blood cells fight infection. The count is usually elevated in meningitis
- **Chest X-rays** can reveal the presence of pneumonia, tuberculosis or fungal infections. Meningitis can occur after pneumonia
- **CT scan** of the head may show problems like a brain abscess or sinusitis. Bacteria can spread from the sinuses to the meninges

Treatment

Treatment is determined by the cause of meningitis.

- **Viral meningitis** is not treated. It usually resolves on its own. Symptoms should go away within two weeks. There are no serious long-term problems associated with viral meningitis. Antibiotics do not help viral infections, so they are not useful in the treatment of viral meningitis. But parenteral antibiotic should be given, until a bacterial cause is excluded. People who develop severe illness or at risk for developing severe illness, such as babies and people with weakened immune systems may need to be hospitalized
- **Bacterial meningitis** requires immediate hospitalization. Early diagnosis and treatment will prevent brain damage and death. Bacterial meningitis is treated with intravenous antibiotics. There is no specific antibiotic for bacterial meningitis. It depends on the bacteria involved

- **Tuberculous meningitis** should be treated with anti TB regimen (CAT- I) as soon as diagnosis is made or strongly suspected

Table-23.5 : Treatment of pyogenic meningitis of unknown cause
1. Adults aged 18 – 50 years with or without a typical meningococcal rash
• Cefotaxime 2 gm IV, 4 times daily **or** • Ceftriaxone 2 gm IV, 2 times daily
2. Patients in whom penicillin-resistant pneumococcal infection is suspected or in areas with a significant incidence of penicillin resistance in the community
As for (1) but add: • Vancomycin 1 gm IV, 2 times daily **or** • Rifampicin 600 mg IV, 2 times daily
3. Adults aged > 50 years and those in whom *Listeria monocytogenes* infection is suspected (brainstem signs, immunosuppression, diabetic, alcoholic)
As for (1) but add: • Ampicillin 2 gm IV, 6 times daily **or** • Co-trimoxazole 50 mg/kg IV daily in two divided doses
4. Patients with a clear history of anaphylaxis to beta-lactams
• Chloramphenicol 25 mg/kg IV, 4 times daily **plus** • Vancomycin 1 gm IV, 2 times daily
5. Adjunctive treatment
• Dexamethasone 0.15 mg/kg, 4 times daily for 2 – 4 days

Table-23.6 : Chemotherapy of bacterial meningitis when the cause is known

Pathogen	Regimen of choice	Alternative agents
N. meningitidis	Benzylpenicillin 2.4 gm IV, 6 times daily for 5 – 7 days	Cefuroxime, Ampicillin, Chloramphenicol*
Strep. pneumoniae (sensitive to beta-lactams, MIC < 1 mg/L)	Cefotaxime 2 gm IV, 4 times daily **or** Ceftriaxone 2 gm IV, 2 times daily for 10 – 14 days	Chloramphenicol*

Table-23.6 : Continued		
Strep. pneumoniae (resistant to beta-lactams)	As for sensitive strains but add Vancomycin 1 gm IV, 2 times daily **or** Rifampicin 600 mg IV, 2 times daily	Vancomycin plus Rifampicin* Moxifloxacin Gatifloxacin
H. influenzae	Cefotaxime 2 gm IV, 4 times daily **or** Ceftriaxone 2 gm IV, 2 times daily for 10 – 14 days	Chloramphenicol*
Listeria monocytogenes	Ampicillin 2 gm IV, 6 times daily **plus** Gentamicin 5 mg/kg IV daily	Ampicillin 2 gm IV, 6 times daily **plus** Co-trimoxazole 50 mg/kg IV daily in two divided doses
Strep. suis	Cefotaxime 2 gm IV, 4 times daily **or** Ceftriaxone 2 gm IV, 2 times daily for 10 – 14 days	Chloramphenicol*
* For patients with a history of anaphylaxis to beta-lactam antibiotics (MIC = Minimum Inhibitory Concentration)		

- **Fungal meningitis** is treated with antifungal agents
- **Corticosteroids** (Adjunctive dexamethasone for bacterial meningitis)-significantly reduce hearing loss and neurological sequelae, but do not reduce overall mortality

Prevention

Maintaining a healthy lifestyle, especially if a person is at increased risk, is important. This includes things like:

- Getting adequate amount of rest
- Not smoking
- Avoiding contact with sick people

Vaccinations can also protect against certain types of meningitis. Vaccines that can prevent meningitis include the following:

- *Haemophilus influenzae* type b (Hib) vaccine
- Pneumococcal conjugate vaccine (PCV)
- Meningococcal vaccine.

24. MODERATE ACUTE MALNUTRITION (MAM) 24

Definition

Confirmed case (Clinically confirmed)

- Any child aged 6 months to 5 years with
  - Weight-for-height z-score (WHZ) ≤ -2 SD and > -3 SD or
  - Weight-for-height median (WHM) ≤ 80% and > 70% or
  - Mid-upper arm circumference ≤ 125 mm and > 115 mm

Moderate Acute Malnutrition (MAM)

Moderate acute malnutrition (MAM) is defined as a weight-for-age between -3 and -2 z-scores below the median of the WHO child growth standards. It can be due to a low weight-for-height (wasting) or a low height-for-age (stunting) or to a combination of both. Similarly, moderate wasting and stunting are defined as a weight-for-height and height-for-age, respectively, between -3 and -2 z-scores.

Children with moderate acute malnutrition have an increased risk of mortality and MAM is associated with a high number of nutrition-related deaths. If some of these moderately malnourished children do not receive adequate support, they may progress towards severe acute malnutrition (severe wasting and/or oedema) or severe stunting (height-for-age less than -3 z-scores), which are both life-threatening conditions. Therefore, the management of MAM should be a public health priority.

Based on scientific literature investigating the relationships among specific individual, household and environmental factors and the development of acute malnutrition in children, the following are significant risk factors for MAM and SAM:

- Inadequate dietary intake
- Inappropriate feeding
- Fetal growth restriction
- Inadequate sanitation
- Lack of parental education
- Family size
- Incomplete vaccination
- Poverty
- Economic, political and environmental instability and emergency situations.

Community based management of MAM: Children with MAM may be managed at the community level using energy and nutrient dense local foods or nutritional supplement which will be provided every two weeks at the outpatient site

The purpose of community based management of MAM

The purpose of the community based management of MAM is to provide decentralized services for as many acute malnourished children as possible. Children aged 6-59 months with MAM can be identified and treated at an outpatient site or directly at the community level by a trained CHW. Children with MAM will receive basic medical treatment and mothers/caregivers counsel on the use of high energy/nutrient dense local foods fortified with micronutrients in the outpatient care. Where this is available, children with MAM may receive a specific nutritional supplement (NS).

Children will be screened and indentified as MAM through **community outreach activities.** There are two possible options

- Referral to an outpatient site
- Direct management of MAM by a CHW at the community level

Community outreach activities are identification, care, referral and follow up of children with acute malnutrition and acutely malnourished pregnant and lactating women (PLW). It links between prevention and treatment. It is conducted by community health workers and volunteers.

Community outreach activities will be conducted by Community Health Workers (CHWs). This includes: Health Assistant (HA), Family Welfare Assistant (FWA), Community Health Care Provider (CHCP), NGO Community Health Workers, Community Nutrition Workers (CNW) and community volunteers.

Enrollment criteria for community based management of MAM
Category criteria

1. **Children 6-59 months**
   - MUAC >115 mm to <125 mm (>11.5 cm to < 12.5 cm) **and**
   - No oedema **and**
   - All of the following
     - ✓ Presence of appetite
     - ✓ With or without infection, like:
       a. Pneumonia (not severe pneumonia or very severe disease)
       b. Diarrhoea with dehydration (No danger signs according to IMCI protocol)
2. **Discharged from SAM**- Child is transferred to MAM after completion of treatment for SAM in the outpatient program
3. **Return after default**- Children who return after default (absent more than 2 visits)

Principles of Management of MAM

- Children with MAM may be managed at an outpatient site
- Acutely malnourished children lack growth nutrients that are required to build new tissues. These nutrients aid weight gain after illness, repair damaged tissues and help replace the rapid turn-over of cells (intestine and immune cells)

- Correct replenishment of nutrients like essential amino acids (protein), potassium, magnesium and zinc (among other minerals) is essential for recovery from malnutrition
- Provide routine medical treatment

Table- 24.1 : Routine medical protocol for MAM

Drug/ Vaccine/ Micronutrient	When	Age	Prescription	Dose
Vitamin A	On enrollment (not taken in last 1 month)	< 6 months	50,000 IU	Single dose on admission
		6 months to < 1 year	1,00,000 IU	
		≥ 1 year	2,00,000 IU	
Albendazole*	On enrollment (not taken in last 3 months)	< 1 year	DO NOT GIVE	
		1 year to < 2 years	200 mg	Single dose
		≥ 2 years	400 mg	
Measles vaccination	On enrollment	After completion of 9 months	Standard	Single dose

Note: Children completing for SAM transferred to the outpatient care for MAM should not be given routine medical treatment again

* Should be taken in empty stomach

The management of MAM can be broadly categorized into prevention and treatment strategies.

a. Strategies for prevention

Strategies for the prevention of MAM dovetail with public health interventions promoting optimal child growth and development. These strategies include the promotion of appropriate breastfeeding and complementary feeding practices, access to appropriate health care for the prevention and treatment of disease, improved sanitation and hygiene practices.

b. Strategies for treatment

The emphasis on exploring optimal food-based treatments for MAM has increased. Supplementary foods for managing MAM in children ages 6–59 months calls for providing locally available, nutrient-dense foods to improve nutritional status and prevent SAM. However, there is no evidence-informed recommendation for the composition of specially formulated foods for treatment.

The Community-Based Management of Acute Malnutrition (CMAM) recommended for counseling of caregivers and selecting appropriate supplementary feeding program (SFP) approaches.

Management of MAM

- **Nutritional management of MAM-** The nutritional management of MAM aims to provide additional energy and nutrient density to the existing home based diet to support catch up growth. This means adding at least 25 kcal/kg/day over and above the energy requirements of a well-nourished child. This should be done by encouraging increased intake of home food
- The staple cereal (rice) should be fortified with micronutrient powder and animal source of food (fish, egg, milk etc) included in the diet
- De-worming should be done at least 6 monthly intervals
- Intercurrent infections should be appropriately treated
- Hygiene should be promoted to prevent infection
- Children with MAM living in extremely food insecure conditions where the caregivers may not be able to provide the additional food will require a nutritional supplement (NS). The NS should ideally provide 700-1000 Kcal/child/day with 25-30% of energy from fat and 10-12% of energy from protein
- Management of micronutrient deficiencies
    1. Management of iron deficiency anaemia (IDA)
    2. Management of vitamin A deficiency (VAD)

1. Management of iron deficiency anaemia (IDA)

a) Supplementary foods rich in iron should be administered. Iron fortified cereals, pulses, beans, ripe banana, green leafy vegetables, meat, fish, eggs, liver should be given

b) Iron containing foods and facilitators of iron absorption such as vitamin C rich foods (citrus, tomatoes, potatoes) should be included in the diet

c) Periodic deworming

d) **Oral iron therapy**

- **Daily dose-** 6 mg elemental iron/kg/day in three divided doses

Table- 24.2 : Elemental iron content of commercially available iron preparations

Iron salts	Total content	Elemental iron content (mg)
Ferrous sulfate	200	40
Ferrous gluconate	300	35
Ferrous fumarate	200	65

- **Duration of therapy-** 6 to 8 weeks beyond haemoglobin and red cell indices has returned to normal. It takes about 8 weeks to increase haemoglobin level to normal. So in total, nearly 4 months treatment is needed.

e) Parenteral iron therapy

Indications

- Intolerance to oral iron
- Poor patient compliance
- Chronic diarrhoea
- Bleeding (from gastrointestinal tract when aggravated by oral therapy)

Dosage of iron dextran- Total dose is

- 100 mg for infants under 6 months
- 200 mg between 6 and 12 months
- 300 mg from 12 months to 24 months
- 400 mg for children over 24 months of age

2. Management of vitamin A deficiency (VAD)-

Discussed later in Severe Acute Malnutrition (SAM) section

Admission

• The following are common criteria in use for admission:

Children aged 6-59 months:

- o W/H or W/L < 80% (WHO/NCHS table) or
- o Mid-Upper Arm Circumference (MUAC) < 125 mm with a length > 65 cm **or**

Note: Oedema is always a sign of severe acute malnutrition

Follow up and discharge

Children and their mothers/ caregivers will have an appointment every two weeks at the outpatient site or with the CHW if managed directly at the community level. At each visit, the child will be assessed and counseled on the use of energy/ nutrition dense local foods. If available, receive the nutritional supplement (NS).

- At each visit the MUAC and weight should be measured and oedema should be assessed
- Children with danger signs should be referred to the nearest health facility
- If the child has not gained weight after three two weekly visits or if the child is losing weight refer him/her for a medical checkup at the nearest inpatient care or health facility
- Children who are enrolled as MAM and then deteriorate or develop oedema should be transferred to the program for SAM

Messages on prevention of MAM

Four essential messages must be given (and practiced) in a community based care for the management of MAM. If NS given, clear advice must to be given to mothers/caregivers on how to store and prepare the NS.

- Exclusive breastfeeding (for 6 months)
- Introduction of appropriate energy and nutrient dense foods, including oil and animal products from 6 months of age
- Hand-washing with soap before eating and after defaecation
- Recognizing danger signs

Discharge criteria

Children are ready for discharge when the following criteria are met

Table- 24.3: Criteria for discharge

Category	Criteria
Recovered	• MUAC ≥ 125 mm For two consecutive visits (one week apart) And • No other severe classification (according to IMCI protocol) ✓ Any general danger sign or ✓ Chest indrawing ✓ Stridor in a calm child
Defaulted	Absent for 2 consecutive visits
Died	Died while enrolled in outpatient program
Non-responder	Child has not reached discharge criteria within 4 months of admission

Supplementary feeding programs

Summary of key steps for out-patient treatment:

- The decision to implement a supplementary feeding program is usually based on raised prevalence of acute malnutrition among children under five and the presence of aggravating factors such as poor food security in the general population, disease epidemic and raised mortality (severity of a crisis). The justification for intervention, the objectives, the target groups and a viable exit strategy must be defined at the start of the program.
- Patients from admission that fulfill the criteria for MAM and do not have medical complications should be registered and all their information recorded in the specific health card including the target weight for discharge (WHO/NCHS table).
- The ration for one child should provide a maximum of 1000 to 1200 kcal/person/day and 10-12% of energy from protein. The following foods are used:
  - o Local foods such as rice, beans and locally-produced vegetables should be the basis for supplementary rations. A fortified food or micro-nutrient supplement (eg- sprinkles) should be added where the minimum required diet cannot be met using available resources.

- Blended cereals can provide 350-400 kcal per 100 gm of dry product. Combined mineral and vitamin mixes should be added to blended cereals that are not pre-fortified. The most common example of blended cereal is the corn soya blend. Supplementary porridge can be made at home by mixing one part of blended cereal with three parts of water and by cooking the mixture until it has boiled and the consistency has thickened. A dry-food ration consists of blended cereals, oil and sugar that are not pre-mixed. A pre-mixed ration is when blended cereals are mixed with oil and sugar prior to distribution. Pre-mixing increases the logistic requirements and can reduce the life-shell of the ration (around two weeks when pre-mixed).
- High-energy and protein biscuits are usually provided only in the onset of an emergency. They should not be given priority over locally-available products and should be avoided in the long-term.

- A dry-food ration can be provided weekly, fortnightly or monthly depending on resources, needs of target population and access to SFP sites. Food should be distributed by weight using a balance or calibrated container and wherever possible, should be transported home by mothers in their own containers. A wet-food ration may place an economic burden on the caregiver that has to come on a daily basis, as well as on the facility because of increased logistic demands.
- Caregivers should bring their admitted child for surveillance through weighing, mid-upper arm circumference (MUAC) screening, oedema checking and assessment of standard clinical signs.

Therapeutic foods for preventing and treating acute malnutrition

Ready-to-use-foods (RUFs) are specially formulated bars, pastes or biscuits that provide varying ranges of high-quality protein, energy and micronutrients. These products are more nutrient dense than available home foods and do not require preparation; they typically have very low moisture content and are resistant to microbes.

With use of each of these products, continued breastfeeding is recommended

- Ready-to-use therapeutic foods (RUTFs), are designed for the treatment of uncomplicated SAM
- Ready-to-use supplementary foods (RUSFs), are designed as a supplement to treat MAM
- Medium-quantity lipid-based nutrient supplements (LNSs), are designed as a supplement to prevent MAM

Fortified blended flours (FBFs) are an additional class of specially formulated foods. FBFs require some preparation before consumption and are typically distributed in larger quantities as family rations for treating or preventing MAM.

25 MUSCULOSKELETAL PROBLEMS

Definition

Musculoskeletal disorders (MSDs) or problems are injuries and disorders that affect the human body's movement or musculoskeletal system (such as muscles, tendons, ligaments, nerves, discs, blood vessels, etc.)

Common symptoms include

- Localized or widespread pain that can worsen with movement
- Aching or stiffness of the entire body
- The feeling that muscles have been pulled or overworked
- Fatigue
- Sleep disturbances
- Twitching muscles
- The sensation of "burning" in muscles

Common MSDs include

- Muscle / tendon strain
- Ligament sprain
- Fractures/ dislocations
- Osteoarthritis
- Systemic lupus erythematosus (SLE)
- Rheumatoid arthritis (RA)
- Carpal tunnel syndrome
- Tendonitis
- Mechanical back syndrome
- Degenerative disc disease
- Ruptured / herniated disc
- Tension neck syndrome
- Thoracic outlet compression
- Rotator cuff tendonitis
- Epicondylitis
- Radial tunnel syndrome
- Digital neuritis
- Trigger finger / thumb
- de Quervain's syndrome and many more.

Investigations

1)X-rays

- ✓ Often, x-rays can help to diagnose fractures, tumours, injuries, infection and deformities (such as congenital hip dysplasia)
- ✓ Sometimes x-rays are helpful in showing changes that confirm a person has a certain kind of arthritis (for example, rheumatoid arthritis or osteoarthritis)
- ✓ X-rays do not show soft tissues such as muscles, bursae, ligaments, tendons or nerves.

2) Laboratory tests

Laboratory tests are often helpful in making the diagnosis of a musculoskeletal disorder. For example

- ✓ Erythrocyte sedimentation rate (ESR)- usually increased when inflammation is present, the ESR can be particularly useful in helping to monitor the progress of treatment in rheumatoid arthritis or polymyalgia rheumatica. A decrease in the ESR suggests that treatment is working to reduce inflammation
- ✓ Creatine kinase- increased when muscle is damaged
- ✓ Rheumatoid factor (RF)- for diagnosing rheumatoid arthritis
- ✓ Anti-cyclic citrullinated peptide (anti-CCP)- helpful in making the diagnosis of RA
- ✓ Antinuclear antibodies- for diagnosing SLE
- ✓ Antibodies to double-stranded deoxyribonucleic acid (Anti-dsDNA) for diagnosing SLE
- ✓ HLA-B27- People who have this gene are at increased risk of developing spondyloarthropathy, a group of disorders that can cause inflammation of the back and other joints as well as other symptoms, such as eye pain and redness and rashes

3) Nerve and muscle tests

- ✓ Nerve conduction studies
- ✓ Electromyography

4) Ultrasonography

Ultrasonography is being used more and more frequently to identify inflammation in and around joints and tears or inflammation of tendons

5) Computed tomography (CT) and magnetic resonance imaging (MRI)

Computed tomography (CT scan) and magnetic resonance imaging (MRI) give much more detail than conventional x-rays and may be done to determine the extent and exact location of damage

6) Bone scanning

Bone scanning is an imaging procedure that is occasionally used to diagnose a fracture, particularly if other tests, such as plain x-rays and CT or MRI, do not reveal the fracture. Bone scanning involves use of a radioactive substance (technetium-99m–labeled pyrophosphate) that is absorbed by any healing bone

7) Joint aspiration

Joint aspiration (arthrocentesis) is used to diagnose certain joint problems

8) Arthroscopy

Arthroscopy is a procedure in which a small (diameter of a pencil) fiberoptic scope is inserted into a joint space, allowing the doctor to look inside the joint and to project the image onto a video monitor.

9) Dual-Energy X-Ray Absorptiometry (DXA)

- ✓ The most accurate way to evaluate bone density, which is necessary when screening for or diagnosing osteopenia or osteoporosis, is with dual-energy x-ray absorptiometry (DXA)
- ✓ DXA is also used to predict a person's risk of fracture and can be useful for monitoring the response to treatment as well
- ✓ This test is quick and painless and involves very little radiation
- ✓ In this test, x-rays are used to examine bone density at the lower spine, hip, wrist or entire body. Measurements of bone density are very accurate at these sites

Treatment

Treatment options for diseases of the musculoskeletal system include

1. Rest, restricted or modified activity, immobilization of diseased or injured structures in splints and casts
2. NSAIDs
3. Corticosteroid
4. Physical therapy
5. Acupuncture
6. Extracorporeal shock wave therapy
7. Surgical repair
8. Therapeutic options for management of musculoskeletal disorders have greatly expanded during the past few years with the use of regenerative medicine, in which growth factors and mesenchymal cell therapy have been used to augment healing.

MENINGITIS- CONFIRMED

26

Meningitis case definitions and confirmation		
Condition	**Case definition/case classification**	**Laboratory confirmation**
Aseptic meningitis	A syndrome characterized by acute onset of meningeal symptoms (stiff neck, fever and headache), cerebrospinal fluid pleocytosis (excessive lymphocytes), with no laboratory evidence of bacterial or fungal organisms. Aseptic meningitis is a syndrome of multiple aetiologies, but many cases are caused by a viral agent. **Confirmed:** A clinically compatible illness diagnosed by a physician as aseptic meningitis, with no laboratory evidence of bacterial or fungal meningitis **or** a viral isolate from cerebrospinal fluid **or** a viral isolate from blood with a clinically compatible illness diagnosed by a physician	Laboratory confirmation • A viral isolate from cerebrospinal fluid **or** • A viral isolate from blood with physician diagnosis of aseptic meningitis Supportive of clinical diagnosis • No growth in CSF or blood cultures • CSF with test results characteristic of viral meningitis
Bacterial and other meningitis	Bacterial meningitis manifests most commonly with fever, headache and a stiff neck; the disease may progress rapidly to shock and death. However, other manifestations may be observed. **Probable:** A clinically compatible case diagnosed by a physician as bacterial meningitis without culture confirmation **Confirmed:** A clinically compatible case that is laboratory confirmed	Isolation of a bacterial species, fungus or parasite from the cerebrospinal fluid or a clinically compatible case accompanied by a positive blood culture

Detail about meningitis is discussed earlier on ***Meningitis- Suspected*** section

27 NEURODEVELOPMENTAL DISORDER

Neurodevelopmental disorders are a group of disorders in which the development of the central nervous system is disturbed. This can include developmental brain dysfunction, which can manifest as neuropsychiatric problems or impaired motor function, learning, language or non-verbal communication.

Neurodevelopmental disorders are characterized by developmental deficits that usually show up early in a child's development, many times before the child enters elementary school and can run throughout the individual's lifetime. These brain function deficits can affect a person's emotions, memory, ability to learn, socialize and maintain self-control. They can be limited in nature, for instance to learning or the deficits can be global and affect intelligence or social skills overall.

The category of neurodevelopmental disorders, as set out in the DSM-5 *(Diagnostic and Statistical Manual of Mental Disorders,* 5th Edition- Edited by *American Psychiatric Association)*, includes:

1. Attention deficit hyperactivity disorder (ADHD)
2. Autism spectrum disorder (ASD)
3. Communication disorders
    a) Language Disorder (combines Expressive and Mixed Receptive-Expressive Disorder)
    b) Speech Sound Disorder (replaces Phonological Disorder)
    c) Childhood Onset Fluency Disorder (formerly Stuttering)
    d) Social Pragmatic Disorder (New)
4. Intellectual developmental disorder
5. Motor disorders
    a) Developmental Coordination Disorder
    b) Stereotypic Movement Disorder
    c) Tourette's Disorder
    d) Other vocal and motor tics & unspecified disorders
6. Specific learning disorders
    a) includes former reading, math, written expression and NOS diagnoses

It is not unusual for these disorders to co-exist. While there are no known cures for neurodevelopmental disorders, medication and therapy treatments do exist that can help a child or adult.

Clinical features

Depending on the exact kind of neurodevelopmental disorder, the signs and symptoms of such disorder may include:

- Those that revolve around sociability, such as the inability to maintain eye contact during social interactions, a failure to respond to one's name and a lack of facial expressions
- Issues pertaining to emotion, such as mood swings, an irritable temper and an easily frustrated state of mind
- Learning based concerns, like problems performing even simple math, difficulty understanding a question, problems in reading or spelling (dyslexia), difficulty speaking, the repetition of words without really understanding how to use them and the inability to properly plan, prioritize, manage time or focus on a task
- Movement and impulse-control related issues, such as restlessness, issues coordinating movement (which can come off as clumsiness) and repetitive motions like rocking or hand flapping

Of course, some of the examples given above can be part of more than one category. For example, difficulty understanding a question would undoubtedly affect both learning and general socialization.

Evaluation and comprehensive assessment

The goals of the initial comprehensive assessment/evaluation are document the child's performance levels, functional abilities in cognitive, language and social domains, contributions of genetic/ metabolic aetiologies and presence of comorbid medical/neurologic disorders such as epilepsy. The assessment/ evaluation should include:

- Detailed developmental and symptom history to assess the full range of psychiatric symptoms and disorders, (eg- irritability, inattention, impulsivity, aggressive behaviours, repetitive, restricted behaviours, anxiety, depression and sleep disturbances) as well as impairment from these symptoms and disorders. The use of rating scales with specific ASD/NDD screens is highly recommended **(using measurement scales and behaviour checklists)**
- A full medical history and physical examination including vision, hearing and dental screening
- Check for diet/nutritional deficiencies, seizures, sleep disturbances and other medical problems
- Special consideration for developmental speech, language and communication assessments
- Obtain medication history
- Assessment of family structure and functioning including a safety assessment of the environment to identify:
    - o Risk of harm to others or self
    - o Nighttime wandering
    - o Signs of abuse and/or neglect

- Behaviour inventory using validated rating scales and checklists to document the occurrence of specific behaviours **(using measurement scales and behaviour checklists)**
- Based upon results of history and physical examination consider as clinically indicated:
    - o Psychometric testing
    - o Genetic evaluation
    - o Neurological assessment

Measurement Scales:

1. Childhood Autism Rating Scale (CARS)
2. Childhood Autism Spectrum Test (CAST) – Public Domain
3. Social Communication Questionnaire (SCQ)
4. Social Responsiveness Scale (SRS)
5. Autism Behaviour Checklist (ABC) – Public Domain

Behaviour checklists:

1. Aberrant Behaviour Checklist (ABC) - can use to assess medication responses
2. Autism Diagnostic Observation Schedule (ADOS)
3. Autism Diagnostic Interview - Revised (ADI-R)

Note: Both the ADOS and ADI-R are the "Gold Standard" if administered by qualified raters.

Treatment plan

Pharmacotherapy is not the primary treatment for youth with neurodevelopmental disorders (NDD). Aim therapy at the most impairing target symptom or diagnosis first.

- Psychoeducation for parents/caregivers regarding neuro-developmental disorders and ADHD
- Non-pharmacological treatment:
    - o Behaviour therapy - (eg: PCIT, ABA, CBT and others)[1]
    - o Speech/language therapy
    - o Physical therapy
    - o Social skills therapy
    - o Special educational services (academic vs. life skills track)
- Treatment of co-occurring medical problems (eg- seizures, medication changes and reactions warrant consideration as cause of disruptive behaviours)

1) Parent-Child Interaction Therapy (PCIT), Applied Behavior Analysis (ABA), Cognitive Behavioural Therapy (CBT).

Autism Spectrum Disorder

Autism spectrum disorder (ASD) takes on a new meaning in the fifth edition of the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)*. Under the old DSM-IV, people could receive one of four separate diagnoses:

1. Autism
2. Asperger's disorder
3. Childhood disintegrative disorder
4. Pervasive developmental disorder not otherwise specified (PDD-NOS)

According to research, clinicians did not consistently apply these diagnoses in their clinics and treatment programs. The DSM-5 removes these four disorders as separate conditions and places them all under the **autism spectrum disorder** umbrella.

What Is autism spectrum disorder?

The term autism spectrum disorder refers to a range of disorders classified as pervasive developmental disorders (PDD) in the DSM-5. **Autism** represents the core of the autism spectrum disorders. **Autism** is characterized by "persistent deficits in social communication and social interaction across multiple contexts", according to the *Autism Speaks* website. Individuals with autism show impairment in the following:

- Impairment in social and emotional reciprocity that ranges from abnormal social approaches and failure to participate in typical give-and-take conversations to diminished sharing of interests and emotions as well as failure to respond to social cues and interactions
- Impairment in use and understanding of nonverbal communications used in social interactions, such as inability to make eye contact and abnormalities in body language. These children also have difficulty understanding the use of physical gestures and often have a complete lack of facial expression
- Impairment in developing and maintaining social relationships

Individuals with autism also exhibit restrictive, repetitive patterns of behaviour, interests and activities, including:

- Repetitive motions or repetitive use of objects or speech
- Inflexible insistence on sameness in routines, exhibit ritualized behaviour patterns or nonverbal behaviour
- Restricted, narrow and fixated interests
- Extreme sensitivity or insensitivity to sensory input from the environment, such as temperature, sounds and textures

These represent a broad overview of autism spectrum disorder symptoms. The symptoms can range from mild to very severe on the autism spectrum. The severity dictates the type of interventions and treatments the clinician advises.

Asperger's syndrome disorder is closely related to typical autism when it comes to symptoms and probably causes. People with this type of autism, formerly called Asperger's syndrome, do not have a significant delay in language development as they do with more severe forms of autism.

Those with the condition formerly known as **childhood disintegrative disorder** seem to develop normally and show age-appropriate verbal and non-verbal communication skills as well as appropriate motor, social and self-care skills. But somewhere between the ages of 2 and 10 years, people with this type of autism lose these skills almost completely in at least two developmental areas.

Children with the form of autism previously called **PDD-NOS** have severe and pervasive impairment in reciprocal social interaction or verbal and nonverbal communication skills and show other stereotypical behaviours associated with autism, but do not meet criteria for a specific pervasive developmental disorder.

Causes of autism spectrum disorder

Experts do not have a clear understanding about the causes of autism spectrum disorder, but scientists believe that genetics and environment play a significant role. Research studies have identified a number of genes associated with ASD and have found differences in brain structure of people with the disorder. Some studies suggest that individuals with ASD have insufficient levels of the neurotransmitter, serotonin, in the brain. These abnormalities may occur due to disruption of normal brain development during a critical time of fetal development. While these findings are interesting, scientists have a long way to go before they pinpoint exact causes of ASD.

How Is autism spectrum disorder treated?

While there is no cure for autism spectrum disorder, there are treatments for ASD and interventions available that can alleviate certain symptoms and lead to significant improvement. The clinician will develop a treatment and intervention plan based on the child's individual needs and the severity of the ASD. Treatments and interventions may include:

- Education and behaviour interventions
- Medications (eg- to treat anxiety, depression, OCD and other autism-related symptoms)
- Other therapeutic interventions

On the autism spectrum

Understanding the levels of severity and criteria associated with disorders on the autism spectrum can be daunting. Most individuals who received a diagnosis of one of the pervasive developmental disorders from a clinician using DSM-IV criteria will retain their diagnosis of ASD and still be eligible for interventions and other resources.

PSYCHOLOGICAL DISEASE (TRAUMA) 28

Definition

Psychological trauma is the unique individual experience of an event or enduring conditions, in which:

- The individual's ability to integrate his/her emotional experience is overwhelmed or
- The individual experiences (subjectively) a threat to life, bodily integrity or sanity

Thus, such an event or situation creates psychological trauma when it overwhelms the individual's ability to cope and leaves that person fearing death, annihilation, mutilation or psychosis. The individual may feel emotionally, cognitively and physically overwhelmed. The circumstances of the event commonly include abuse of power, betrayal of trust, entrapment, helplessness, pain, confusion and/or loss. People with these symptoms may present with a wide range of non-specific psychological and medically unexplained physical complaints. These symptoms include reactions to a potentially traumatic event within the last month, for which people seek help or which causes considerable difficulty with daily functioning.

Possible results may include

- Disorientation
- Confusion
- Sense of instability
- Sense of loss
- Lack of trust
- Sense of inferiority
- Isolation
- Looking to the past, the future but not the present

When to refer clients to specialized services

- When they are suicidal and/or self-harming
- When they are violent against others
- When they are unable to function
- When they ask for it

Indicators for inability to function

- Being unable to state simple facts of life (name, town of birth, age, name of children)
- Being unable to attend to basic daily routines in own pace

Be aware

- Inability and un-willingness are different concepts
- Threats to commit suicide are always to be taken seriously and immediately referred

Post Traumatic Stress Disorder (PTSD)

- Post-traumatic stress disorder (PTSD) is a mental disorder caused by very stressful, frightening or distressing events.
- Someone with PTSD often relives the traumatic event through nightmares and flashbacks and may experience feelings of isolation, irritability and guilt.
- Exposure to violent personal assaults, sexual assault, mugging, witnessing violent deaths, military conflicts, being held as hostage, sudden attacks, natural or man-made disasters etc can lead to PTSD.
- It can occur at any age, beginning after the first year of life. Symptoms usually begin within the first 3 months after the trauma. It also can develop immediately after someone experiences a disturbing event or it can occur weeks, months or even years later.
- PTSD is estimated to affect about 1 in every 3 people who have a traumatic experience. But it is not clear exactly why some people develop the condition and others do not.
- People who repeatedly experience traumatic situations such as severe neglect, abuse or violence may be diagnosed with **complex PTSD**. It has similar symptoms to PTSD and may not develop until years after the event. It is often more severe if the trauma is experienced early in life as this can affect a child's development and impairs the quality of life during the adulthood.
- It can also occur in the people working for the refugees (eg- NGO workers, doctors, law enforcing officials), who are experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (eg- repeatedly exposed to details of any sort of abuse especially sexual or child abuse).
- Problems and disorders those are more likely to occur after exposure to stressors (eg- potentially traumatic events)
  - ✓ Moderate-severe depressive disorder
  - ✓ Psychosis
  - ✓ Harmful use of alcohol and drugs
  - ✓ Suicide and other significant mental health complaints
- PTSD is not an anxiety disorder any more.

Common symptoms

1. Recurrent distressing memories or dreams or flashbacks of traumatic events
2. Physiological or psychological reactions at exposure to cues that symbolize or resemble to the traumatic events
3. Persistent avoidance of stimuli related to traumatic events

4. Negative alterations in cognition and mood associated with traumatic events, like- inability to remember, negative beliefs, blaming self for the events, fear, horror, anger, guilt, shame, feelings of detachment from others, inability to experience happiness or other good feelings etc
5. Hyper-arousal and reactivity symptoms, like- irritable behaviour, anger outbursts, verbal or physical aggression to others, self-destructive behaviour, startle response, sleep disturbance etc

In children, these symptoms can be expressed in different ways, like- frightening dreams without recognizable contents, play with the theme of traumatic events, restricted play etc.

Diagnosis

Full copyrighted criteria are available from the *American Psychiatric Association*. All of the criteria are required for the diagnosis of PTSD. The following text summarizes the diagnostic criteria:

Criterion A (one required): The person was exposed to: death, threatened death, actual or threatened serious injury, or actual or threatened sexual violence in the following way(s):

- Direct exposure
- Witnessing the trauma
- Learning that a relative or close friend was exposed to a trauma
- Indirect exposure to aversive details of the trauma, usually in the course of professional duties (eg- first responders, medics)

Criterion B (one required): The traumatic event is persistently re-experienced in the following way(s):

- Unwanted upsetting memories
- Nightmares
- Flashbacks
- Emotional distress after exposure to traumatic reminders
- Physical reactivity after exposure to traumatic reminders

Criterion C (one required): Avoidance of trauma-related stimuli after the trauma in the following way(s):

- Trauma-related thoughts or feelings
- Trauma-related reminders

Criterion D (two required): Negative thoughts or feelings that began or worsened after the trauma in the following way(s):

- Inability to recall key features of the trauma
- Overly negative thoughts and assumptions about oneself or the world
- Exaggerated blame of self or others for causing the trauma
- Negative affect
- Decreased interest in activities
- Feeling isolated
- Difficulty experiencing positive affect

Criterion E (two required): Trauma-related arousal and reactivity that began or worsened after the trauma in the following way(s):

- Irritability or aggression
- Risky or destructive behaviour
- Hypervigilance
- Heightened startle reaction
- Difficulty concentrating
- Difficulty sleeping

Criterion F (required): Symptoms last for more than 1 month

Criterion G (required): Symptoms create distress or functional impairment (eg- social, occupational)

Criterion H (required): Symptoms are not due to medication, substance use or other illness

After diagnosing through an initial assessment, the doctor should provide the treatment as discussed below. In follow-up visits the symptoms should be reassessed and if the symptoms of PTSD are severe enough or they last for more than four weeks, the patient should be referred to a mental health specialist for further assessment and treatment.

Treatment

A. Watchful waiting

- If the patient has mild symptoms of PTSD or had symptoms for less than four weeks, an approach called watchful waiting may be recommended. It involves carefully monitoring the symptoms to see whether they improve or get worse. It is sometimes recommended because 2 in every 3 people who develop problems after a traumatic experience get better within a few weeks without treatment. If watchful waiting is recommended, the patient should be given a follow-up appointment within one month.

B. Psychotherapy

- If PTSD persists after watchful waiting, it requires treatment and psychotherapy is usually recommended first. A combination of psychotherapy and medication may be recommended in case of severe or persistent PTSD.
- There are **three main types** of psychotherapy used to treat people with PTSD. First, the **cognitive behavioural therapy (CBT)** which is a type of therapy that aims to help in managing the problems by changing how a person thinks and acts. Usually 8 – 12 weekly sessions of trauma-focused CBT lasting for around 60 – 90 minutes is required. Second, **eye movement desensitization and reprocessing (EMDR)** which is a relatively new treatment which has been found to reduce the symptoms of PTSD. It involves making side-to-side eye movements, usually by following the movement of the therapist's finger, while recalling the traumatic incident.

Other methods may include the therapist tapping his/her finger or playing a tone. Third, **group therapy** as some people find it helpful to speak about their experiences with other people who also have PTSD. Group therapy can be used to teach different ways to manage the symptoms and help the patient understand the condition.

- If there is no trained physician/ psychiatrist/ psychologist/ mental health worker within the facility, please refer to the higher centre.

C. Medications

- Following medications can be recommended for use in the treatment of PTSD: **Sertraline, Paroxetine, Fluoxetine, Venlafaxine, Mirtazapine** and **Amitriptyline**
- Among these medications, **Paroxetine** and **Sertraline** are the only ones licensed specifically for the treatment of PTSD. However, **Mirtazapine, Amitriptyline** and **Phenelzine** have also been found to be effective and may be recommended as well
- Antidepressants can also be prescribed to reduce any associated symptoms of depression and anxiety and to help with sleeping problems. However, they are not usually prescribed for people younger than 18 years unless recommended by a specialist
- If medication for PTSD is effective, it will usually be continued for a minimum of 12 months before being gradually withdrawn over the course of four weeks or longer. If a medication is not effective at reducing the symptoms, the dosage may be increased
- Before prescribing a medication, the doctor should inform the patient or attendant about possible side-effects while taking it, along with any possible withdrawal symptoms when the medication is withdrawn. For example, common side effects of **Paroxetine** include feeling sick, blurred vision, constipation and diarrhoea. Possible withdrawal symptoms associated with **Paroxetine** include sleep disturbances, intense dreams, anxiety and irritability. Withdrawal symptoms are less likely if the medication is reduced slowly
- For children and young people with PTSD, trauma-focused CBT is usually recommended instead of medication.

Depression

Depression is a common disorder, which often leads to poor quality of life and impaired role functioning. It is known to be a major contributor to the global burden of diseases. According to World Health Organization (WHO), depression is the fourth leading cause of disability worldwide and it is projected that by 2020, it will be the second most common leading cause of disability. Depression is also associated with high rates of suicidal behaviour and mortality. When depression occurs in the context of medical morbidity, it is associated with increased health care cost, longer duration of hospitalization, poor cooperation in treatment, poor treatment compliance and high rates of morbidity.

Diagnosis

A. Basic assessments

- Complete history with information from all possible sources
- Physical examination- look for thyroid swelling, evidence for malnutrition or any specific nutritional deficiency
- Record blood pressure, weight and wherever indicated body mass index and waist circumference
- Mental state examination (MSE)- MSE is a structured way of observing and describing a patient's current state of mind, under the domains of appearance, attitude, behaviour, mood, affect, speech, thought process, thought content, perception, cognition and insight
- Establish diagnosis according to current diagnostic criteria
- Differential diagnosis by ruling out secondary depression
- Areas to be evaluated: symptom-severity, symptom-dimensions (psychotic symptoms, catatonic symptoms, melancholic symptoms, reverse vegetative symptoms and cognitive symptoms), comorbid physical, psychiatric and substance use conditions, risk of harm to self and others, level of functioning and socio-cultural milieu of the patient
- Basic investigations: haemogram, blood sugars and lipid levels, liver functions, renal functions, thyroid function test (if indicated)
- Assessments of caregivers: knowledge and understanding of the illness, attitudes and beliefs regarding treatment, impact of the illness on them, personal and social resources
- Ongoing assessments: response to treatment, side effects, treatment adherence, the impact of patient's immediate environment, disability assessments, other health-care needs, ease of access and relationship with the treatment team

B. Additional/ optional assessments

- Use of standardized rating scales to rate all aspects of the illness

- Neuro-imaging especially in those with first-episode of depression seen in late or very late age; those have neurological signs, those having treatment resistant depression

Diagnostic criteria (DSM-5) - Major Depressive Disorder

A. Five (or more) of the following symptoms have been present during the same 2-week period and represent a change from previous functioning; at least one of the symptoms is either (1) depressed mood or (2) loss of interest or pleasure.

Note: Do not include symptoms that are clearly attributable to another medical condition.

1. Depressed mood most of the day, nearly every day, as indicated by either subjective report (eg- feels sad, empty, hopeless) or observation made by others (eg- appears tearful). (***Note:*** In children and adolescents, can be irritable mood)
2. Markedly diminished interest or pleasure in all or almost all activities most of the day, nearly every day (as indicated by either subjective account or observation)
3. Significant weight loss when not dieting or weight gain (eg- a change of more than 5% of body weight in a month) or decrease or increase in appetite nearly every day. (***Note:*** In children, consider failure to make expected weight gain)
4. Insomnia or hypersomnia nearly every day
5. Psychomotor agitation or retardation nearly every day (observable by others, not merely subjective feelings of restlessness or being slowed down)
6. Fatigue or loss of energy nearly every day
7. Feelings of worthlessness or excessive or inappropriate guilt (which may be delusional) nearly every day (not merely self-reproach or guilt about being sick)
8. Diminished ability to think or concentrate or indecisiveness, nearly every day (either by subjective account or as observed by others)
9. Recurrent thoughts of death (not just fear of dying), recurrent suicidal ideation without a specific plan or a suicide attempt or a specific plan for committing suicide

B. The symptoms cause clinically significant distress or impairment in social, occupational or other important areas of functioning.

C. The episode is not attributable to the physiological effects of a substance or to another medical condition.

Note: Criteria A-C represent a major depressive episode.

Note: Responses to a significant loss (eg- bereavement, financial ruin, losses from a natural disaster, a serious medical illness or disability) may include the feelings of intense sadness, rumination about the loss, insomnia, poor appetite and weight loss noted in Criterion A, which may resemble a depressive episode. Although such symptoms may be understandable or considered appropriate to the loss, the presence of a major depressive episode in addition to the normal response to a significant loss should also be carefully considered. This decision inevitably requires the exercise of clinical judgment based on the individual's history and the cultural norms for the expression of distress in the context of loss.

D. The occurrence of the major depressive episode is not better explained by schizoaffective disorder, schizophrenia, schizophreniform disorder, delusional disorder or other specified and unspecified schizophrenia spectrum and other psychotic disorders.

E. There has never been a manic episode or a hypomanic episode.

Note: This exclusion does not apply if all of the manic-like or hypomanic-like episodes are substance-induced or are attributable to the physiological effects of another medical condition.

Specify:

- ✓ With anxious distress
- ✓ With mixed features
- ✓ With melancholic features
- ✓ With atypical features
- ✓ With mood-congruent psychotic features
- ✓ With mood-incongruent psychotic features
- ✓ With catatonia
- ✓ With peripartum onset
- ✓ With seasonal pattern (recurrent episode only)

Figure- 28.1 : Management algorithm of depression

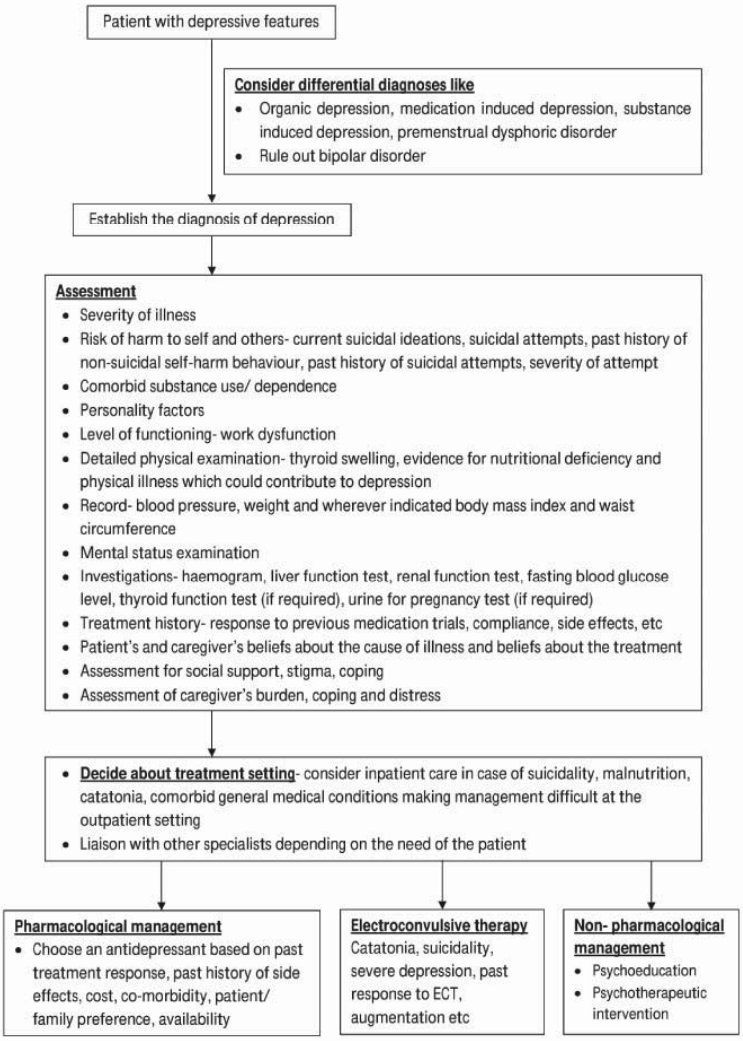


Table- 28.1 : List of medications for pharmacological management		
Antidepressant	**Usual dosage range (mg/day)**	**Common side effects**
Selective Serotonin Reuptake Inhibitors (SSRIs)		
• Fluoxetine	20 – 80	Sexual dysfunction, GI distress, weight loss/ gain, anxiety, insomnia
• Paroxetine	20 – 60	
• Fluvoxamine	50 – 300	
• Sertraline	50 – 200	
• Citalopram	20 – 40	
• Escitalopram	10 – 20	
Tricyclic Tertiary Amines (TCAs)		
• Amitriptyline	50 – 200	Sexual dysfunction, anticholinergic effects, drowsiness, orthostasis, conduction abnormalities, mild GI distress, weight gain
• Doxepin	75 – 300	
• Imipramine	75 – 300	
• Clomipramine	75 – 300	
Tricyclic Secondary Amines		
• Desimipramine	100 – 300	Dry mouth, constipation, blurred vision, sedation (limits use), weight gain, sexual dysfunction, orthostatic hypotension
• Nortriptyline	25 – 150	
• Protriptyline	15 – 20	
Tetracyclic		
• Maprotiline	50 – 75	Allergic reaction, fever, sore throat, seizures, eye problems, drowsiness, dizziness
Unicyclic		
• Bupropion	150 – 450	Mild GI distress, high risk of seizure after 450 mg/day
Norepinephrine Serotonin Reuptake Inhibitors (NSRIs)		
• Venlafaxine	75 – 300	Mild anticholinergic effects, drowsiness, conduction abnormalities, GI distress
• Duloxetine	20 – 60	
• Milnacipran	50 – 200	
• Desvenlafaxine	50 – 400	
Norepinephrine Serotonin Reuptake Enhancers (NSREs)		
• Tianeptine	25 – 50	Nausea, constipation, abdominal pain, headache, dizziness, changes in dreaming

Noradrenaline and Specific Serotonin Antidepressants (NaSSAs)		
• Mirtazapine	15 – 45	Mild anticholinergic effects, drowsiness, orthostasis, conduction abnormalities, GI distress, weight gain
Atypical Antidepressants/ Serotonin Modulators		
• Trazadone • Nefazodone	150 – 300 100 – 300	Mild anticholinergic effects, drowsiness, orthostasis, conduction abnormalities, GI distress, weight gain
Reversible Selective Monoamine Oxidase Inhibitors (RIMAs)		
• Meclobemide	150 – 600 or more	Sleep disturbance at night, sleepiness during the day, agitation, dizziness on standing, dry mouth, tremor
Monoamine Oxidase Inhibitors (MAOIs)		
• Phenelzine • Isocarboxazid • Tranylcypromine	45 – 90 30 – 60 20 – 60	Orthostasis, hypotension, drowsiness, insomnia, headaches
Serotonin Partial Agonist Reuptake Inhibitors (SPARIs)		
• Vilazodone	20 - 40	Diarrhoea, nausea, vomiting, insomnia

For non-pharmacological treatments like psychotherapy or cognitive behavioural therapy, please follow the CBT description as mentioned in the management of PTSD or refer to the nearest center having psychiatrist or psychologist.

Substance related problems

Psychoactive substances have the ability to change consciousness, mood and thoughts (WHO, 2004).

Classification of substance: [According to DEA (Drug Enforcement Administration)]

1) Narcotics- Heroin, Morphine, Opium, Methadone
2) Stimulants- Amphetamines (YABA), Cocaine, Methamphetamine
3) Depressants- Barbiturates, Benzodiazepines, Rohypnol
4) Hallucinogens- Marijuana/Cannabis, Ecstasy/MDMA, LSD, Steroids, Inhalants
5) Drugs of Concern- Designer Cannabinoids

Problems due to substance intoxication and substance withdrawal can appear on emergency basis. Intoxication denotes a transient syndrome occurring due to recent substance ingestion causing significant physical and psychological impairment. On the contrary, withdrawal refers to symptoms and signs those occur when a drug is withdrawn or reduced in amount in the blood.

Each substance has its individual intoxication and withdrawal symptoms.

Intoxication and withdrawal symptoms of some commonly used substances are given below:

A. Alcohol, sedatives, hypnotics and anxiolytics

Intoxication- During or shortly after ingestion

- **Psychological**: Impairment in attention or memory
- **Physical:** Slurred speech, incoordination, nystagmus, unsteady gait and coma

Withdrawal- history of intake several hours to few days ago

- **Psychological:** Transient visual, tactile or auditory hallucinations
- **Physical:** Excessive sweating, increased pulse rate greater than 100 beats/min, increased hand tremor, nausea or vomiting, restlessness, seizures, insomnia

B. Cannabis

Intoxication- history of cannabis intake within 2 hours

- **Physical:** Conjunctival injection, increased appetite, dry mouth, tachycardia

Withdrawal- history of cannabis withdrawal within 1 week

- **Psychological:** Irritability, anger or aggression, nervousness or anxiety, restlessness, depressed mood
- **Physical symptoms** causing significant discomfort: abdominal pain, sweating, shakiness/tremors, fever, chills or headache, sleep difficulty (eg: insomnia, disturbing dreams), decreased appetite or weight loss

C. Opioids

Intoxication

- **Psychological:** Initial euphoria followed by apathy, dysphoria, agitation or retardation, impaired judgment.
- **Physical:** Pupillary constriction (or pupillary dilation due to anoxia from severe overdose), drowsiness, slurred speech, impairment in attention, coma

Withdrawal

- **Psychological:** Dysphoria

- **Physical:** Nausea or vomiting, muscle aches, yawning, lacrimation or rhinorrhoea, pupillary dilation, piloerection, sweating, diarrhoea, fever, insomnia

D. Stimulants

Intoxication- During or shortly after, use of a stimulant

- **Psychological:** Euphoria or affective blunting, changes in sociability, hyper vigilance, interpersonal sensitivity, anxiety, anger, stereotyped behaviours, impaired judgment.
- **Physical:** Tachycardia or bradycardia, elevated or lowered blood pressure, chills, nausea or vomiting, muscular weakness, respiratory depression, chest pain or cardiac arrhythmias, pupillary dilation, confusion, seizures, dyskinesia, dystonia or coma.

Withdrawal

- **Psychological**: Dysphoria
- **Physical:** Fatigue, vivid, unpleasant dreams, insomnia or hypersomnia, increased appetite.

What to do:

If suspected as a case of substance related problems, refer the patient to a nearby health centre.

Special note:

- YABA= Amphetamine (mainly) + caffeine + ephedrine
- Phensedyl cough syrup = Codeine (mainly) + pseudoephedrine + promethazine

29 RESPIRATORY TRACT INFECTION

Definition

Respiratory tract infection is an infection that may interfere with normal breathing. It can affect:

- Upper respiratory tract, which starts from sinuses and ends at vocal chords **and/ or**
- Lower respiratory tract, which starts from vocal chords and ends at lungs

Clinical features

- Symptoms- fever, cough, respiratory distress and features of complications
- Signs- crepitations, rhonchi, intercostal indrawing, convulsion, coma

This infection is particularly dangerous for children, older adults and people with immune system disorders.

A) Upper respiratory tract infection (URTI)

- Typical infections of the upper respiratory tract include tonsillitis, pharyngitis, laryngitis, sinusitis, otitis media, certain types of influenza and the common cold.
- Symptoms of URTIs can include cough, sore throat, runny nose, nasal congestion, headache, low grade fever, facial pressure and sneezing.
- Upper respiratory infections can happen at any time, but are most common in the fall and winter.
- The vast majority of upper respiratory infections are caused by virus and are self-limited.
- Antibiotics are rarely needed to treat upper respiratory infections and generally should be avoided, unless the doctor suspects a bacterial infection.
- Simple techniques, such as, proper hand washing and covering face while coughing or sneezing, may reduce the spread of upper respiratory infections.
- General outlook for upper respiratory infections is favourable, although, sometimes complication can occur.

B) Lower respiratory tract infection (LRTI)

- Lower respiratory tract infections (LRTIs), while often used as a synonym for pneumonia, can also be applied to other types of infection including lung abscess and acute bronchitis
- Symptoms include shortness of breath, weakness, fever, coughing and fatigue

Syndromic cases of LRTI

1. Adults (5 years or older) with-
   - Temperature ≥ 38°C or subjective fever and
   - Cough or sore throat and
   - Shortness of breath or difficulty breathing
2. Child (2 months to < 5 years of age) with-
   - Cough or difficulty breathing and
   - Any one of the following general danger signs:
     - ✓ Breathing rate > 50 breaths/minute (infant 2 – 12 months)
     - ✓ Breathing rate > 40 breaths/minute (child 1 – 5 years)
     - ✓ Chest indrawing
     - ✓ Stridor in a calm child
     - ✓ Unable to drink or breastfeed
     - ✓ Vomits everything
     - ✓ Convulsions
     - ✓ Lethargic or unconscious
3. Infant (< 2 months of age) with-

   Any one of the following*:
   - Breathing rate > 60 breaths/minute or
   - Severe chest indrawing or
   - Nasal flaring (when an infant breathes in) or
   - Grunting (when an infant breathes out)

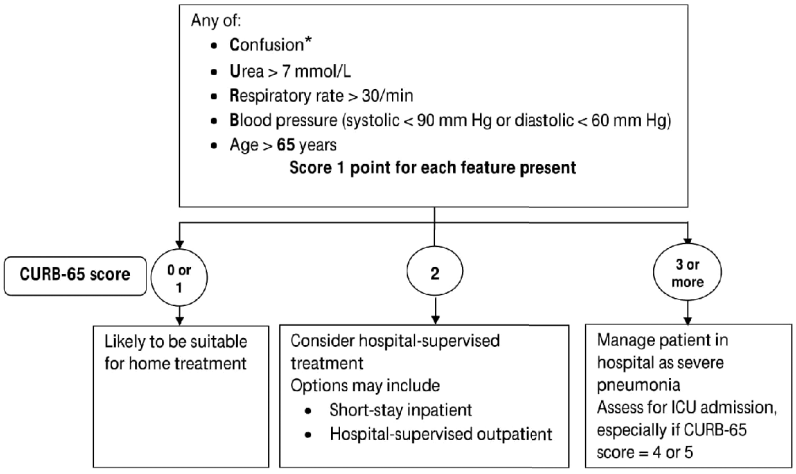
*Infants < 2 months of ages with any of these danger signs must be referred for serious bacterial infection.

Table- 29.1 : Organisms causing community- acquired pneumonia

Bacteria	
• Streptococcus pneumoniae • Mycoplasma pneumoniae • Legionella pneumophilia • Chlamydia pneumoniae • Haemophilus influenzae • Staphylococcus aureus	• Chlamydia psittaci • Coxiella burnetii (Q fever, 'querry' fever) • Klebsiella pneumoniae (Freidlander's bacillus) • Actinomyces israelii
Virus	
• Influenza, parainfluenza • Measles • Herpes simplex • Varicella	• Adenovirus • Cytomegalovirus (CMV) • Coronavirus (Urbani SARS-associated coronavirus)
(SARS = Severe Acute Respiratory Syndrome)	

Table- 29.2 : Factors that predispose to pneumonia	
• Cigarette smoking • Upper respiratory tract infections • Alcohol • Corticosteroid therapy • Old age	• Recent influenza infection • Pre-existing lung disease • HIV • Indoor air pollution

Figure- 29.1 : Assessment of the severity of illness (by CURB- 65)



Hospital CURB-65. * Defined as mental test score of 8 or less, or new disorientation in person, place or time. (ICU = intensive care unit; urea of 7 mmol/L = 20 mg/dl)

Investigations of LRTIs

There are several tests doctor may perform if LRTI is suspected:

- Chest x-ray: creates an image of the lungs. Doctors can visually inspect this image for signs of pneumonia
- Blood test: a sample of blood is taken for full blood count and inspected in a laboratory for the presence of viruses, bacteria or other organisms
- Laboratory tests: a sample of sputum or mucus is taken and inspected in a laboratory for the presence of bacterial organisms
- Pulse oximetry: this test uses a small sensor that attaches to the finger or ear. It uses light to estimate how much oxygen is present in the blood

Treatment

Many LRTIs are self-limited and resolve without the need for additional treatment. There is no universal treatment for all LRTIs, so if a patient needs treatment, doctor will choose treatments that best address the symptoms he/ she is experiencing.

- Lifestyle
  - ✓ Ingest plenty of fluids and get plenty of rest
  - ✓ Using a humidifier to breathe warm, moist air may provide relief
  - ✓ Be sure to avoid cigarette smoke and other pollutants, such as chemical fumes
- Medications

  Since most LRTIs are viral, medications are generally not used in treatment. However, certain over-the-counter medicines may provide some relief from symptoms:
  - ✓ Nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen, naproxen or aspirin can relieve pain and fever
  - ✓ Acetaminophen can also provide relief from pain and fever
  - ✓ Using a bronchodilator inhaler can help wheezing and shortness of breath
  - ✓ If an LRTI is bacterial, antibiotics may be prescribed (based on clinical assumption), depending on how serious the infection is and overall health status of the pataint

Table- 29.3 : Antibiotic treatment for CAP*
Uncomplicated CAP
• Amoxicillin 500 mg 3 times daily orally
If patient is allergic to penicillin
• Clarithromycin 500 mg twice daily orally or
• Erythromycin 500 mg 4 times daily orally
If Staphylococcus is cultured or suspected
• Flucloxacillin 1–2 gm 4 times daily IV plus Clarithromycin 500 mg twice daily IV
If Mycoplasma or Legionella is suspected
• Clarithromycin 500 mg twice daily orally or IV or
• Erythromycin 500 mg 4 times daily orally or IV plus Rifampicin 600 mg twice daily IV in severe cases

Table- 29.3 (Continued) : Severe CAP
• Clarithromycin 500 mg twice daily IV or • Erythromycin 500 mg 4 times daily IV plus Co-amoxiclav 1.2 gm 3 times daily IV or • Ceftriaxone 1–2 gm daily IV or • Cefuroxime 1.5 gm 3 times daily IV or • Amoxicillin 1 gm 4 times daily IV plus Flucloxacillin 2 gm 4 times daily IV
*Adapted from British Thoracic Society Guidelines.

• Other treatments

In the case of serious LRTIs, treatment in a hospital may be necessary. Treatments for LRTIs in the hospital may include:

- ✓ Intravenous fluids
- ✓ Improvement of nutritional status of the patient
- ✓ Humidified oxygen
- ✓ Ventilation support, eg- high flow oxygen, CPAP, BiPAP or mechanical ventilation, if severe respiratory insufficiency develops

Table- 29.4 : Indications for referral to intensive therapy unit (ITU)
• CURB score of 4 – 5, failing to respond rapidly to initial management • Persisting hypoxia (PaO_2 < 8 kPa (60 mm of Hg)), despite high concentrations of oxygen • Progressive hypercapnia • Severe acidosis • Circulatory shock • Reduced conscious level

Table- 29.5 : Complications of pneumonia
• Para-pneumonic effusion- common • Empyema • Retention of sputum causing lobar collapse • Deep vein thrombosis and pulmonary embolism • Pneumothorax, particularly with Staph. aureus • Suppurative pneumonia/ lung abscess • ARDS, renal failure, multi-organ failure • Ectopic abscess formation (Staph. aureus) • Hepatitis, pericarditis, myocarditis, meningoencephalitis • Pyrexia due to drug hypersensitivity

Case definition (Diagnostic criteria)

- A child aged 6 months to 5 years is classified as severely malnourished if he/ she has one or more of the following
  - o Weight-for-height z-score (WHZ) < -3 SD
  - o Weight-for-height median (WHM) < 70%
  - o Mid-upper arm circumference < 115 mm
  - o Bipedal oedema (kwashiorkor, marasmic kwashiorkor- 'oedematous malnutrition')
- A child aged < 6 months should be classified as severely malnourished if he/ she has one or more of the following:
  - o Visible wasting
  - o WHM <70% or WHZ < -3 SD
  - o Bipedal oedema

Severe acute malnutrition

Severe acute malnutrition is defined by a very low weight for height (below -3z scores of the median WHO growth standards[1]), by visible severe wasting or by the presence of nutritional oedema (characterized by swollen feet, face and limbs).

1. Based on WHO standards (www.who.int/childgrowth/standards)
   - Marasmus- severe form of acute malnutrition characterized by wasting of body tissues– marasmic children are extremely thin
   - Kwashiorkor- severe form of acute malnutrition characterized by bilateral oedema and weight for height of greater than or equal to -2 SD
   - Marasmic-Kwashiorkor- severe form of acute malnutrition characterized by bilateral oedema and weight for height of less than -2 SD

Management of SAM (Severe Acute Malnutrition)

To maximize coverage and access to therapeutic care for severely malnourished children, an approach that combines the following components is most appropriate:

- Active case seeking in the community for severe acute malnutrition through rapid screening methods such as mid-upper arm circumference (MUAC)
- Management at the facility level for severely malnourished children with complications
- Management at the community level for severely malnourished children without complications and children who have been discharged from facility-based inpatient care

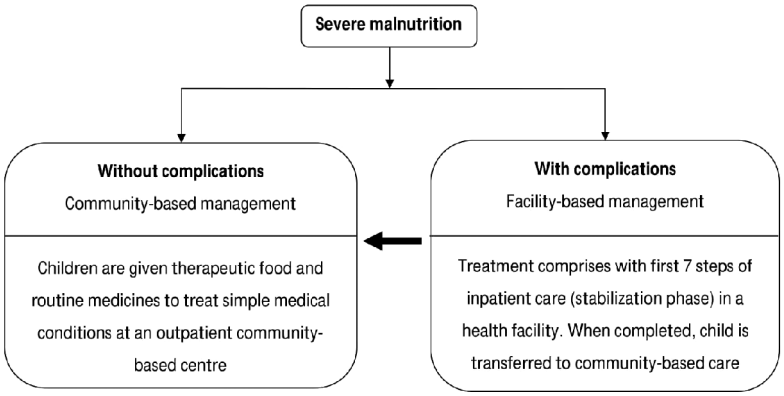


Table- 30.1 : Presence of any of the following conditions requires facility-based inpatient treatment

Sign	Criteria for inpatient treatment
Oedema	Grade +++
	Marasmic kwashiorkor- a child with severe wasting (MUAC <110mm or WHM <70% or WHZ <-3 SD) and oedema
Appetite/ anorexia	Poor appetite or unable to eat
Vomiting	Persistent vomiting (≥3 per hour)
Temperature	Fever (>39°C or 102.2°F axillary) or hypothermia (<35°C or 95°F axillary)
Respiratory rate	Rapid breathing according to IMCI guidelines: > 60 /min for children aged <2 months > 50 /min for children aged 2 -12 months > 40 /min for children aged 12 - 59 months
Anaemia	Severely pale (severe palmer pallor) with or without difficult breathing
Infection	Extensive infection requiring parenteral treatment
Alertness	Very weak, apathetic, unconscious, fitting/ convulsions
Hydration status and dehydrating diarrhoea	Dehydration based primarily on a recent history of diarrhoea, vomiting, fever or sweating, not passing urine for last 12 hours and on recent appearance of clinical signs of dehydration as reported by the caregiver
Other criteria	Infants <6 months with severe acute malnutrition
	Caregiver requests inpatient care
	Physician's impression

There are ten essential steps for management:

- Step 1: Treat/prevent hypoglycaemia
- Step 2: Treat/prevent hypothermia
- Step 3: Treat/prevent dehydration
- Step 4: Correct electrolyte imbalance
- Step 5: Treat/prevent infection
- Step 6: Correct micronutrient deficiencies
- Step 7: Start feeding cautiously including breast feeding
- Step 8: Achieve catch-up growth
- Step 9: Provide sensory stimulation and emotional support
- Step 10: Prepare for discharge and follow-up after recovery

The ten steps are accomplished in two phases, as shown by the typical time-frame for the management of a child with severe acute malnutrition in following table

Table- 30.2 : Time-frame for management of SAM

Serial no	Steps	Stabilization phase days 1 - 7	Rehabilitation phase weeks 2 - 6
01	Hypoglycaemia	→	
02	Hypothermia	→	
03	Dehydration	→	
04	Electrolytes	→	→
05	Infection	→	
06	Micronutrients	No Iron	Iron →
07	Cautious feeding	→	
08	Catch up growth		→
09	Sensory stimulation	→	→
10	Prepare for follow up		→

- Stabilization phase: when life-threatening problems are identified and treated, specific deficiencies are corrected, metabolic abnormalities are reversed and feeding is begun
- Rehabilitation phase: when intensive feeding is started to recover lost weight; emotional and physical stimulation are increased; breastfeeding is re-initiated and/or encouraged; the mother or caregiver is trained to continue care at home and preparations are made for discharge of the child

Treatment of SAM

Step 1. Treat/prevent hypoglycaemia

A. If the child is conscious give:

- 50 ml bolus of 10% glucose or sucrose solution (5 gm or 1 rounded teaspoon of sugar in 50 ml or 3.5 tablespoons water), orally or by nasogastric (NG) tube
- Then feed starter diet F-75 (as in Step 7) every 30 minutes for two hours (giving one fourth volume of the total recommended two hours' feed)
- Keep the child warm
- Antibiotics (as in Step 5)
- Two-hourly feeds, day and night (as in Step 7)

B. If the child is unconscious or convulsing give:

- 10% glucose (5 ml/kg) IV followed by 50 ml of 10% glucose or sucrose by NG tube. Then give starter F-75 as above
- If convulsion persists after completion of IV glucose, give per rectal diazepam (0.5mg/kg body weight)
- Keep the child warm
- Antibiotics (as in Step 5)
- Two-hourly feeds, day and night (as in Step 7)

Step 2. Treat/prevent hypothermia

- Re-warm the child: either clothe the child (including head), cover with a warmed blanket and increase the ambient temperature with available but safe heat source(s) or put the child on the mother's bare chest (skin to skin) and cover them
- Feed as in step 7

Step 3. Treat/prevent dehydration

- The standard oral rehydration salts (ORS) solution (90 mmol sodium/L) and the newly modified WHO-ORS (75 mmol sodium/L) contains too much sodium and too little potassium for severely malnourished children
- Instead give special Rehydration Solution for Malnutrition (ReSoMal)
- Give all children with watery diarrhoea:
  - ✓ Every 30 min for first two hours, ReSoMal 5 ml/kg orally or by nasogastric tube, then
  - ✓ Alternate hours for 4-10 hours, ReSoMal 5-10 ml/kg/hours (the exact amount to be given should be determined by how much the child wants and stool loss and vomiting). F-75 is given in alternate hours during this period until the child is rehydrated
  - ✓ After rehydration, continue feeding F-75 (see step 7)

- If diarrhoea is severe then new WHO-ORS (75 mmol sodium/L) may be used because the loss of sodium in the stool is high and symptomatic hyponatremia can occur with ReSoMal
- Stop ReSoMal as soon as the child has 3 or more of the following signs of improved hydration status:
    - o Child no longer thirsty
    - o Passing urine
    - o Slowing of respiratory and pulse rates from previous high rates
    - o Skin pinch less slow
    - o Tears
- Low blood volume can coexist with oedema. Do not use the IV route for rehydration except in cases of shock and then do so with care, infusing slowly to avoid flooding the circulation and overloading the heart

Table- 30.3 : Composition of ReSoMal oral rehydration solution	
Ingredients	Amount
Water (boiled and cooled)	850 ml
WHO-ORS (new low osmolarity formulation)	One 500 ml packet
Sugar	20 gm
Electrolyte-mineral solution	16.5 ml

Step 4. Correct electrolyte imbalance

Until stabilization, give:

- Extra potassium 3-4 mmol/kg/day
- Extra magnesium 0.4-0.6 mmol/kg/day
- When rehydrating, give low sodium rehydration fluid (eg- ReSoMal)
- Prepare food without salt
- Do not treat oedema with a diuretic

Step 5. Treat/prevent infection

Give routinely on admission:

- Broad-spectrum antibiotic(s)

Step 6. Correct micronutrient deficiencies

Vitamin A orally on Day 1 unless there is definite evidence that a dose has been given in the last month (for age >12 months, give 200,000 IU; for age 6-12 months, give 100,000 IU; for age 0-5 months, give 50,000 IU)

Give daily for at least 2 weeks:

- Multivitamin supplement (without iron)
- Folic acid: 1 mg/day (give 5 mg on day 1)

- Zinc: 2 mg/kg/day
- Copper: 0.3 mg/kg/day (if available)
- Elemental iron: 3 mg/kg/day but only when gaining weight (start in rehabilitation phase when gaining weight)

Step 7. Start feeding cautiously

The essential features of feeding during the stabilization phase are:

- Small, frequent (2-3 hourly) feeds of low osmolarity and low lactose
- Oral or nasogastric (NG) feeds (never parenteral preparations)
- Energy intake of ~100 kcal/kg/day
- Protein intake of 1-1.5 gm protein/kg/day
- Total fluid intake through feeds should not be more than 130 ml/kg/day (100 ml/kg/day if the child has severe (+++) oedema, which means oedema of the legs, hands and face)
- If the child is breastfed, encourage to continue breastfeeding but give the prescribed amounts of starter formula (F-75) to make sure the child's needs are met.

Table- 30.4 : Frequency and volume of feeding for children with SAM

Days	Frequency	Vol/kg/feed	Vol/kg/day
1 – 2	2- hourly	11 ml	130 ml
3 – 5	3- hourly	16 ml	130 ml
6 +	4- hourly	22 ml	130 ml

Step 8: Achieve catch-up growth

- In the rehabilitation phase a vigorous approach to feeding is required to achieve very high intakes and rapid weight gain of >10 gm gain/kg/day
- Readiness to enter the rehabilitation phase is signalled by a return of appetite, usually about one week after admission and a loss of most/all of the oedema. A gradual transition is recommended to avoid the risk of heart failure which can occur if children suddenly consume huge amounts
- Replace starter formula F-75 with the same amount of catch-up formula F-100 every 4 hours for 48 hours then
- Increase each successive feed by 10 ml until some feed remains uneaten. The point when some remains unconsumed after most feeds is likely to occur when intakes reach about 30 ml/kg/feed (200 ml/kg/day)
- Weight gain should be monitored to assess response
  - ✓ Poor: ≤ 5 gm/kg/day
  - ✓ Moderate: 5 – 10 gm/kg/day
  - ✓ Good: ≥ 10 gm/kg/day

Table- 30.5 : Nutritional composition F-75 and F-100		
	F-75 (100 gm milk powder)	F-100 (100 gm milk powder)
Macronutrients		
Energy (kcal)	446	520
Protein (gm)	5.9	>13
Lipid (gm)	15.6	>26
Minerals		
Potassium (mg)	775	1100
Calcium (mg)	560	300
Phosphorus (mg)	330	300
Magnesium (mg)	50	80
Zinc (mg)	12.2	11

Table- 30.6 : Recipe for F-75 and F-100			
Type of milk	Ingredients	Amount for F-75	Amount for F-100
Dried skimmed milk	Dried skimmed milk	25 gm	80 gm
	Sugar	70 gm	50 gm
	Cereal flour	35 gm	---
	Vegetable oil	30 gm (or 35 ml)	60 gm (or 70 ml)
	Electrolyte mineral mix	20 ml	20ml
	Water: make up to	1000 ml	1000 ml
Dried whole milk	Dried whole milk	35 gm	110 gm
	Sugar	70 gm	70 gm
	Cereal flour	35 gm	---
	Vegetable oil	20 gm (or 20 ml)	30 gm (or 35 ml)
	Electrolyte mineral mix	20 ml	20 ml
	Water: make up to	1000 ml	1000 ml
Full-cream cow's milk	Full-cream cow's milk	300 ml	880 ml
	Sugar	70 gm	75 gm
	Cereal flour	35 gm	---
	Vegetable oil	20 gm (or 20 ml)	20 gm (or 20 ml)
	Electrolyte mineral mix	20 ml	20 ml
	Water: make up to	1000 ml	1000 ml

Step 9. Provide sensory stimulation and emotional support

Severe malnutrition affects mental and behavioural development, which can be reversed by appropriate treatment including sensory stimulation and emotional support

Provide:

- Tender loving care (smiling, laughing, patting, touching etc)
- A cheerful, stimulating environment
- Structured play therapy 15-30 min/day. The play sessions should make use of toys made of locally available discarded materials
- Physical activity as soon as the child is well enough
- Parental/caregiver involvement when possible (eg- comforting, feeding, bathing, play) so that the special care is continued at home

Step 10. Prepare for discharge and follow-up after recovery

Discharge may be given if the following criteria are present

Table- 30.7 : Discharge criteria for children with SAM

Child	Mother/ caregiver
• WHM ≥ 80% or WHZ ≥ -2SD • Oedema has resolved • Gaining weight at a normal or increased rate • Child eating an adequate amount of nutritious food that the mother can prepare at home • All infections and complications have been treated • Child is provided with micronutrients • Immunization is updated	• Knows how to prepare appropriate foods and to feed the child • Knows how to make appropriate toys and to play with the child • Knows how to give home treatment of common ailments and can recognize danger signs

Follow-up

- At 1 week after discharge
- Regular check-ups should made at 1 week, 2 week, 1 month, 3 month and every 3 months thereafter until WHM > 90% or WHZ > -1 SD, at which point the child is discharged

Treatment of associated conditions

1. Vitamin A deficiency

- Vitamin A should be supplemented on days 0, 1 and 14 at doses mentioned earlier in step- 6.
- If associated with corneal clouding or ulceration
  - ✓ Cover eyes with eye pads soaked in saline solution and bandage
  - ✓ Antibiotic eye drop (**Chloramphenicol** or **Tetracycline**): 1 – 2 drops in both eyes 2 – 3 hourly for 7 – 10 days
  - ✓ Tetracycline eye ointment in the affected eye at night
  - ✓ Instil **artificial tear** to the eyes
  - ✓ Atropine eye drop (1%): 1 drop 3 times daily for 3 – 5 days
  - ✓ Steroid eye ointment/ drop should never be used.

2. Dermatosis

Present with hypo or hyperpigmentation, desquamation, ulceration, exudative lesions (resembling severe burns) and weeping skin lesions (in and around the buttocks)

Treatment

- Keep the perineum dry
- Apply 1% potassium permanganate solution soaked gauze over affected areas and keep for 10 minutes twice daily
- For fungal infections
  - ✓ Skin lesions- cream Clotrimazole twice daily for 2 weeks
  - ✓ Oral candidiasis- drop Nystatin 1 ml (15 drops- containing 1 lac units) four times daily for 7 days

3. Helminthiasis

Treatment should be delayed until the rehabilitation phase

- A single dose of oral Albendazole 200 mg for children aged 12 months to < 2 years, 400 mg for children aged ≥ 2 years

4. Treating diarrhoea and dysentery

- Treat Giardiasis with oral Metronidazole (7.5 mg/kg 8-hourly for 7 days)
- Treat dysentery with either
  - ✓ Oral **Ciprofloxacillin** 10 mg/kg/dose 12 hourly for 3 days or
  - ✓ Oral Pivmecillinum 15 mg/kg/dose 6 hourly for 5 days

5. Tuberculosis

- Suspected cases should be evaluated by Mantoux test and chest x-ray
- If test is positive or there is strong suspicion of TB, treatment should be given with anti TB drugs as per National Guideline.

31 SEXUAL ASSAULT

Definition

Sexual assault is defined as a sexual act committed against someone without that person's freely given consent. Sexual assault is divided into the following types:

- Completed or attempted forced penetration of a victim
- Completed or attempted alcohol/drug-facilitated penetration of a victim
- Completed or attempted forced acts in which a victim is made to penetrate a perpetrator or someone else
- Completed or attempted alcohol/drug-facilitated acts in which a victim is made to penetrate a perpetrator or someone else
- Non-physically forced penetration which occurs after a person is pressured verbally or through intimidation or misuse of authority to consent or acquiesce
- Unwanted sexual contact
- Non-contact unwanted sexual experiences

Sexual assaults are distinguished from other assaults by forcible, inappropriate sexual behaviour. In the course of a sexual assault, any injury may be inflicted on the victim, up to and including life-threatening multiorgan system trauma.

History

After performing a preliminary survey to establish the presence of any potentially serious injury or illness, obtain further history from the victim. Address the following:

- A brief description of the incident
- Location of the assault
- Identity of the assailant or assailants, if known
- Home and workplace of the assailant, if known
- Method by which the assailant left the scene
- Whether or not a weapon was used to coerce the victim
- Whether or not drugs were proffered to render the victim incapable of resistance
- Whether or not the patient has changed clothes, showered or douched since the incident

A standard obstetrical and gynecological history should also be taken to facilitate appropriate pregnancy and STD prophylaxis. This should include last menstrual period, birth control method and time of last consensual intercourse.

Signs and symptoms

Signs of sexual assault include evidence of the use of force and/or lack of consent, such as the following:

- Presence of blood and/or sperm
- Contusions
- Lacerations
- Abdominal trauma
- Joint dislocation
- Mechanical back pain
- Abruptio placentae
- Lesions caused by forceful genital penetration

Post traumatic stress disorder (PTSD) can also result from sexual assault, as can unwanted pregnancy and sexually transmitted disease/ infection.

Treatment

- Treatment of patient of sexual assault is more complex than the routine patients
- The physician must provide psychological support and referral to the appropriate resources, treat physical injuries, collect legal evidence and document pertinent history, perform a thorough head-to-toe physical examination, give prevention of unwanted pregnancy and provide prevention of and screening for STDs
- Treatment and documentation must be accurate and meticulous
- At present, CDC guidelines for postsexual assault prophylaxis are as follows
  - ✓ Ceftriaxone 250 mg IM in a single dose, plus azithromycin 1 gm PO in a single dose, plus metronidazole 2 gm PO in a single dose or tinidazole 2 gm PO in a single dose.
  - ✓ HPV vaccination is recommended for female survivors aged 9–26 years and male survivors aged 9–21 years. The vaccine should be administered to sexual assault survivors at the time of the initial examination and follow-up dose administered at 1–2 months and 6 months after the first dose
  - ✓ Recommendations for HIV PEP (post exposure prophylaxis) are individualized according to risk
  - ✓ Offer pregnancy prophylaxis if the pregnancy tests result is negative
  - ✓ Update tetanus status when necessary
  - ✓ Evaluate the patient's hepatitis B immunization status
    - ♦ Postexposure hepatitis B vaccination, without hepatitis B immunoglobulin, should adequately protect against the hepatitis B virus
    - ♦ Hepatitis B vaccine should be administered to sexual assault victims at the time of the initial examination if they have not been previously vaccinated. Follow-up doses of vaccine should be administered 1-2 months and 4-6 months after the first dose
- Provide reassurance and emotional support.

32 SEXUALLY TRANSMITTED DISEASES/ STI

Definition

Syndromic case

A. Urethral discharge syndrome- Any male with urethral discharge with or without dysuria

B. Vaginal discharge syndrome- Any female with abnormal vaginal discharge (amount, colour and odour) within or without lower abdominal pain or specific symptoms or risk factors (Candidiasis, Trichomoniasis, Bacterial vaginosis)

C. Genital ulcer syndrome (non-vesicular)- Any male with an ulcer on the penis, scrotum or rectum, with or without inguinal adenopathy or any female with ulcer on labia, vagina or rectum with or without inguinal adenopathy

D. Pelvic Inflammatory Disease (PID)- Symptoms of lower abdominal pain and pain during sexual relations, with examination showing vaginal discharge, lower abdominal tenderness on palpation or temperature >38.0°C

Table- 32.1 : List of the STDs/ STIs

Bacterial	Viral	Fungal
• Gonorrhoea (Neisseria gonorrhoeae)	• AIDS (HIV)	• Candidiasis/ Moniliasis (Candida albicans)
• Syphilis (Treponema pallidum)	• Hepatitis B, C	Protozoal
• Chancroid (Haemophilus ducreyi)	• Genital Herpes (Herpes Simplex)	• Trichomoniasis (Trichomonas vaginalis)
• Lymphogranuloma venereum (Chlamydia trachomatis)	• Genital warts, anal warts (HPV)	• Giardiasis (Giardia lamblia)
• Granuloma inguinale (Calymmatobacterium granulomatis)	• Genital moluscum contagiosum (Moluscum contagiosum)	Ectoparasites
		• Scabies (Sarcoptes scabiei)
		• Pediculosis pubis (Pthisis pubis)

Vulnerable persons for STI

1. Sex workers, male and female
2. Clients of sex workers
3. Men who have sex with men
4. Injecting drug users (sex for money or drugs) and their partners
5. Frequent travelers

Venereal diseases- (Those STDs that must be transmitted by sexual contact)

1. Syphilis
2. Gonorrhoea
3. Chancroid
4. Granuloma inguinale
5. Lymphogranuloma venereum

Urethral discharge syndrome

Causes of urethral discharge

- Neisseria gonorrhoeae
- Chlamydia trachomatis
- Ureaplasma urealyticum
- Trichomonas vaginalis
- Herpes simplex virus

Syphilis

Table- 32.2 : Classification of syphilis

Stage	Acquired	Congenital
Early	Primary Secondary Latent	Clinical Latent
Late	Latent Benign tertiary Cardiovascular Neurosyphilis	Clinical Latent

Acquired syphilis

Early syphilis

Primary syphilis

1. Incubation period- between 14-28 days, with a range of 9 – 90 days
2. The primary lesion is chancre (develops at the site of infection, usually in the genital area, a dull macule develops, becomes papular and then erodes to form an indurated ulcer- chancre)
3. Lymph nodes become enlarged, mobile, discrete and rubbery
4. The chancre and lymph nodes both are painless, non-tender
5. Without treatment, the chancre will resolve within 2 – 6 weeks leaving a thin atrophic scar

6. Chancre may develop on the vaginal wall and on the cervix
7. Extra genital chancre are found in 10% of patients, affecting sites such as the finger, lip, tongue, tonsil, nipple, anus or rectum (Anal chancres often resemble fissures and may be painful)

Secondary syphilis

1. Occurs 6 – 8 weeks after the development of chancre
2. Treponemes disseminate to produce a multisystem disease
3. Constitutional features, such as mild fever, malaise and headache are common
4. Over 75% of the patients present with rash on the trunk and limbs that may later involve the palms and soles. This is initially macular but evolves to maculopapular or papular forms, which are generalized, symmetrical and non-irritable. Scales may forms on the papules later
5. Lesions are red and changing to a 'gun-metal' grey as they resolve
6. Without treatment the rash may last up to 12 weeks
7. Condylomata lata (papules coalescing to plaques) may develop in warm moist areas, such as the vulva or peri-anal area
8. Generalized non-tender lymphadenopathy is present in over 50% of patients
9. Rarely produces 'snail track ulcers' in the mouth
10. Other features, such as meningitis, cranial nerve palsies, anterior or posterior uveitis, hepatitis, gastritis, glomerulonephritis or periostitis are sometimes seen
11. Neurological involvement may be more common in HIV positive patients

Latent syphilis

1. It is characterized by presence of positive syphilis serology or the diagnostic CSF abnormalities of neurosyphilis in an untreated patient with no evidence of clinical disease
2. It is divided into early latency (within 2 years of infection), when syphilis may be transmitted sexually and late latency, when the patient is no longer sexually infectious
3. Transmission of syphilis from a pregnant woman to her fetus and rarely by blood transfusion, is possible for several years following infection

<u>Late syphilis</u>

Late latent syphilis

1. May persist for many years or for life
2. Without treatment over 60% of patients might be expected to suffer little or no ill health

3. Coincidental prescription of antibiotics for other illnesses, such as respiratory tract or skin infections, may treat latent syphilis serendipitously

Benign tertiary syphilis

1. Develop between 3 – 10 years after infection
2. Skin, mucous membranes, bone, muscle or viscera can be involved
3. The characteristic feature is a chronic granulomatous lesion called Gumma, which may be single or multiple
4. Skin lesions may take the form of nodules or ulcers, whilst the subcutaneous lesions may ulcerate with a gummy discharge
5. Healing occurs slowly with the formation of characteristic tissue paper scars
6. Mucosal lesions may occur in the mouth, pharynx, larynx or nasal septum, appearing as punched-out ulcers. Of particular importance is gummatous involvement of the tongue healing of which may lead to leucoplakia with the attendant risk of malignant change
7. Paroxysmal cold haemoglobinuria may be seen

Cardiovascular syphilis

1. This may present many years after initial infection
2. Aortitis, which may involve the aortic valve and/ or coronary ostia is the key feature
3. Clinical features include aortic incompetence, angina and aortic aneurysm
4. The condition typically affects the ascending aorta and sometimes the aortic arch; aneurysm of the descending aorta is rare
5. Surgical intervention may be required to correct the anatomical damage

Neurosyphilis

1. May take years to develop
2. Asymptomatic infection is associated with CSF abnormalities in the absence of clinical signs
3. Meningovascular disease, tabes dorsalis and general paralysis of the insane constitute the symptomatic forms
4. Neurosyphilis and cardiovascular syphilis may coexist and sometimes referred to as quaternary syphilis

Table- 32.3 : Congenital syphilis	
Early congenital syphilis (neonatal period)	
• Maculopapular rash • Condylomata lata • Mucous patches • Fissures around mouth, nose, anus • Rhinitis with nasal discharge (snuffles) • Hepatosplenomegaly	• Osteochondritis/ periostitis • Generalized lymphadenopathy • Choroiditis • Meningitis • Anaemia/ thrombocytopenia
Late congenital syphilis	
• Benign tertiary syphilis • Periostitis • Paroxysmal cold haemoglobinuria • Neurosyphilis	• 8th nerve deafness • Interstitial keratitis • Clutton's joints (painless effusion into knee joints)
Stigmata	
• Hutchison's incisors (anteriorposterior thickening with notch or narrowed cutting edge) • Mulberry molars (imperfectly formed cusps/ deficient dental enamel) • High arched palate • Maxillary hypoplasia • Saddle nose (following snuffles) • Rhagades (radiating scars around mouth, nose and anus following rash) • Salt and pepper scars on retina (from choroiditis) • Corneal scars (from interstitial keratitis) • Sabre tibia (from periostitis) • Bossing of frontal and parietal bones (healed periosteal nodes)	

Diagnosis of syphilis

A. Treponema pallidum may be identified in serum collected from chancres, or from moist or eroded lesions in secondary syphilis using a dark-field microscope, a direct fluorescent antibody test or PCR

B. Serological tests for syphilis

Non-treponemal (non-specific) tests

- Venereal Diseases Research Laboratory (VDRL)
- Rapid Plasma Reagin (RPR) test

Treponemal (Specific) antibody tests

- Treponemal antigen-based enzyme immunoassay (EIA) for IgG and IgM
- T. pallidum haemagglutination assay (TPHA)
- T. pallidum particle agglutination assay (TPPA)
- Fluorescent treponemal antibody-absorbed (FTA-ABS) test

C. In benign tertiary and cardiovascular syphilis, CSF study should be considered

D. CXR, ECG, Echocardiogram are useful in the investigation of cardio vascular syphilis

E. Biopsy may be required to diagnose Gumma

Biological false positive reactions occur with VDRL and RPR tests (when treponemal tests will be negative)

- **Acute false positive reactions-** associated with infections, such as infectious mononucleosis, chickenpox, malaria and may also occur in pregnancy
- **Chronic false positive reactions-** may be associated with autoimmune diseases
- **False negative** results for non-treponemal tests may be found in secondary syphilis because extremely high antibody levels can prevent the formation of the antibody-antigen lattice necessary for the visualization of the flocculation reaction (the prozone phenomenon)

Treatment of syphilis

- **Penicillin** is the drug of choice
  - A single dose of 2.4 million units of intramuscular benzathine penicillin is recommended for early syphilis (<2 years duration)
  - Three doses at weekly intervals being recommended in late syphilis
- **Doxycycline 100 mg** twice daily for 14 days or **tetracycline 500 mg** 4 times daily for 14 days can be used for nonpregnant penicillin-allergic patients with primary or secondary syphilis
- Single dose **azithromycin 2 grams** orally is effective but resistance has been documented
- **Ceftriaxone** for neurosyphilis

✓ Persons who receive syphilis treatment must abstain from sexual contact with new partners until the syphilis sores are completely healed

✓ Persons with syphilis must notify their sex partners so that they also can be tested and receive treatment if necessary

During pregnancy

- Pregnant women should be treated with the **penicillin** regimen appropriate for their stage of infection
- For women who have primary, secondary or early latent syphilis, a second dose of benzathine penicillin 2.4 million units IM can be administered 1 week after the initial dose

- **No proven alternatives** to penicillin are available for treatment of syphilis during pregnancy. Pregnant women who have a history of penicillin allergy should be desensitized and treated with penicillin
- **Tetracycline** and **doxycycline** are contraindicated in the second and third trimester of pregnancy. Erythromycin and azithromycin should not be used, because they neither reliably cure maternal infection nor treat an infected fetus. Data are insufficient to recommend ceftriaxone for treatment of maternal infection and prevention of congenital syphilis

- When syphilis is diagnosed during the second half of pregnancy, management should include a sonographic fetal evaluation for congenital syphilis. However, this evaluation should not delay therapy. Sonographic signs of fetal or placental syphilis (i.e., hepatomegaly, ascites, hydrops, fetal anaemia or a thickened placenta) indicate a greater risk for fetal treatment failure.
- Women treated for syphilis during the second half of pregnancy are at risk for premature labour and/or fetal distress if the treatment precipitates the Jarisch-Herxheimer reaction. These women should be advised to seek obstetric attention after treatment if they notice any fever, contractions or decrease in fetal movements.
- Stillbirth is a rare complication of treatment, but concern for this complication should not delay necessary treatment. No data are available to suggest that corticosteroid treatment alters the risk for treatment-related complications in pregnancy.
- Missed doses are not acceptable for pregnant women receiving therapy for late latent syphilis. Pregnant women who miss any dose of therapy must repeat the full course of therapy.
- All women who have syphilis should be offered testing for HIV infection.

Congenital syphilis (Recommended Regimens)

- **Aqueous crystalline penicillin G** 100,000–150,000 units/kg/day, administered as 50,000 units/kg/dose IV every 12 hours during the first 7 days of life and every 8 hours thereafter for a total of 10 days, **or**
- **Procaine penicillin G** 50,000 units/kg/dose IM in a single daily dose for 10 days
- Infants and children who require treatment for congenital syphilis but who have a **history of penicillin allergy or develop an allergic reaction presumed secondary to penicillin**, should be desensitized and then treated with penicillin

Gonorrhoea

a) Clinical features (symptoms and signs)

Male	Female
• Dysuria- painful burning of frequent micturition • Mucoid urethral discharge within days • Mucopurulent or purulent discharge • Red oedematous everted urethral meatus • Tender swollen and finally formation of abscess in periurethral region • If not treated adequately, acute prostatitis characterized by frequency and perineal and suprapubic discomfort • If not treated adequately, then chronic prostatitis characterized by burning micturition, perineal discomfort • Ascending infection may follow- ✓ Cystitis ✓ Trigonitis ✓ Seminal vesiculitis ✓ Epididymitis ✓ Orchitis ✓ Epididymo-orchitis • In homosexual men, there may be rectal infection	• Dysuria • Slight mucoid urethral discharge • Profuse vaginal discharge • Salpingitis, oophoritis, salpingo- oophoritis • On colposcopy- angry or red looking erosion

b) Diagnosis

- History of exposure
- Clinical presentation (as above)
- Microscopic examination of urethral discharge, vaginal and cervical swabs-
  - ✓ Gram staining of specimen- shows intra and extra cellular Gram negative diplococci
  - ✓ Fermentation test- Gonococcus only ferments glucose
  - ✓ Culture of gonococci in chocolate agar media
  - ✓ Complement fixation test (CFT) for gonococcus

c) Treatment

1. Uncomplicated cases

- ✓ Inj. Ceftriaxone 500 mg IM stat **or**
- ✓ Tab/ Cap Cefixime 400 mg orally stat **or**
- ✓ Tab. Ciprofloxacin 500 mg orally stat **or**
- ✓ Tab. Ofloxacin 400 mg orally stat **or**
- ✓ Cap. Ampicillin 3 gm orally and probenecid 1gm orally stat

2. Quinolones resistance cases

- ✓ Inj. Ceftriaxone 500 mg IM stat **or**
- ✓ Inj. Spectinomycin 2 gm IM stat

3. Pharyngeal gonorrhoea

- ✓ Inj. Ceftriaxone 500 mg IM stat **or**
- ✓ Tab/ Cap Cefixime 400 mg orally stat **or**
- ✓ Tab. Ciprofloxacin 500 mg orally stat **or**
- ✓ Tab. Ofloxacin 400 mg orally stat

4. Pregnancy and breast feeding

- ✓ Inj. Ceftriaxone 500 mg IM stat **or**
- ✓ Tab/ Cap Cefixime 400 mg orally stat **or**
- ✓ Inj. Spectinomycin 2 gm IM stat **or**
- ✓ Cap. Ampicillin 3 gm and probenecid 1gm orally stat

**** Partner should be notified*

d) Complications

- Acute prostatitis
- Epididymo-orchitis
- Bartholin's gland abscess
- PID (may lead to infertility or ectopic pregnancy)
- Disseminated gonococcal infection

Non gonococcal urethritis

Causes of non gonococcal urethrltls

01. Most frequently isolated organisms
    - *Chlamydia trachomatis*
    - *Mycoplasma hominis*
    - *Ureaplasma urealyticum*

02. Less common
    - *Trichomonas vaginalis*
    - *Candida albicans*
    - *Neisseria meningitidis*
    - Herpes simplex virus
    - UTI
    - Urethral stricture
    - Foreign body
    - Associated with Reiter's disease

03. No cause (about 30%)

Vaginal discharge syndrome

Candidiasis/ Moniliasis	Trichomoniasis	Bacterial vaginosis
Causative organism *Candida albicans*	**Causative organism** *Trichomonas vaginalis*	**Causative organism** • Declining lactobacilli, which allows other opportunistic bacteria to thrive • Most common organism *Gardnerella vaginalis*
Clinical features • Profuse curdy vaginal discharge with intense pruritus • Dysuria and dyspareunia due to local soreness	**Clinical features** • Profuse, may offensive watery vaginal discharge • Often dating from last menstruation • Dysuria, frequency of micturition • Irritation and itching around the introitus	**Clinical features** • Many women with bacterial vaginosis have no signs or symptoms • Foul-smelling "fishy" vaginal odour • Vaginal itching • Burning during urination
PV examination • Thick curdy white discharge adherent to vaginal wall • Red swollen vulva • Tender	**PV examination** • Thin, greenish yellow and frothy offensive discharge • Inflamed vulva • Red, inflamed vaginal wall with multiple punctate haemorrhagic spot (strawberry) • Similar spot over the mucosa of portio vaginalis part of cervix	**PV examination** • Thin, grey, white or green vaginal discharge

Diagnosis Culture in Nickerson's or Sebouraud's media	**Diagnosis** Identification of the organism by hanging drop preparation	**Diagnosis** • **Amsel criteria** 1. Thin, white, yellow, homogeneous discharge 2. Clue cells on microscopy 3. pH of vaginal fluid > 4.5 4. Release of a fishy odour on adding alkali- 10% potassium hydroxide (KOH) solution (Positive **Whiff** test) -At least three of the four criteria should be present for a confirmed diagnosis
Treatment • Local fungicidal preparation containing Nystatin 100,000 units in pessary at bed time for consecutive 2 weeks • In severe cases, additional use of pessary in morning • In refractory cases, clotrimazole or miconazole vaginal tablet for 3 consecutive nights	**Treatment** • Tab Metronidazole 400mg TDS for 7 days • Husband should be given the same treatment • If symptoms persists second course for 7 days • To prevent recurrence, same treatment for both husband and wife for 7 days following menstruation for 3 consecutive cycles • In unresponsive cases, vaginal tablets containing clotrimazole 100 mg daily for 6 consecutive nights	**Treatment** • Tab. Metronidazole 2gm stat or 400mg BD for 5-7 days • Clindamycin vaginal cream 2% daily for 7 days
Preventive measures • Local hygiene • Safe sexual intercourse • Safe P/V examination		

Chlamydial infection

a) Clinical presentations and complications

Male	Female
Symptoms **1)** Urethral symptoms are usually milder **2)** Asymptomatic in over 50% of cases **3)** Conjunctivitis is also milder than in gonorrhoea, pharyngitis does not occur **4)** The incubation period varies from 1 week to few months **5)** Without treatment, symptoms may resolve but the patient remains infectious for several months **Complications** **1)** Epididymo-orchitis (sexually transmitted pathogens, chlamydia or gonococci, are usually responsible for epididymo-orchitis in men aged less than 35 years whereas bacteria such as Gram negative enteric organisms are commonly implicated in older men) **2)** Reiter's syndrome or sexually acquired reactive arthropathy (SARA)	**Symptoms** **1)** The cervix and urethra are commonly involved **2)** Infection is asymptomatic in about 80% of patient **3)** May cause vaginal discharge, dysuria and intermenstrual and/ or postcoital bleeding **4)** Lower abdominal pain and dyspareunia are features of PID **Examination** May reveal mucopurulent cervicitis, contact bleeding from the cervix, evidence of PID or no obvious clinical signs **Complications** **1)** Some infections may clear spontaneously but other persists **2)** PID, with the risk of tubal damage and subsequent infertility or ectopic pregnancy, is rare but important long term complication **3)** Other complications include perihepatitis, chronic pelvic pain, conjunctivitis and Reiter's syndrome or SARA **4)** Perinatal transmission may lead to ophthalmia neonatorum and/ or pneumonia in the neonate

b) Diagnosis

- **Sample required-**
  - ✓ For women, a swab or brush of cells or secretion from vagina
  - ✓ For men or women, the initial portion of urine stream (first-catch urine sample)
  - ✓ Sometimes a swab of cells or secretion from a non-genital area that may be infected

- **Diagnostic tests includes**
  1) **NAAT-** The nucleic acid amplification test (NAAT) is the recommended method of testing for chlamydia. NAAT is a molecular test that detects the genetic material (DNA) of *Chlamydia trachomatis*. It is generally more sensitive and specific than other chlamydia tests and can be performed on a vaginal swab on women or urine from both men and women, which eliminates the need for a pelvic examination in women.
  2) Other chlamydia tests include **culture**, which grows the bacteria, **direct fluorescent antibody stain (DFA**), and **DNA probe**, but these are used less commonly since they are less sensitive to detect a chlamydia infection.

c) Treatment

- Cap. Doxycycline 100 mg BD for 7days **or**
- Tab. Azithromycin 1 gm orally as single dose

Alternatively

- Tab. Erythromycin 500 mg 6 hourly for 14 days **or**
- Tab. Ofloxacin 200 mg BD for 7 days

Genital Herpes Simplex

a) Clinical features (symptoms and signs)

1. Irritable vesicles that soon rupture to form small tender ulcer on external genitalia
2. Lesion on other sites (eg- urethra, vagina, cervix, peri-anal area, anus or rectum) may cause dysuria, urethral or vaginal discharge or anal, perianal or rectal pain
3. Constitutional symptoms- fever, headache, malaise
4. Enlarged, tender inguinal lymph nodes
5. There may be nerve root pain in 2nd and 3rd sacral dermatomes
6. External lesions may develop at other sites- buttock, finger or eye due to auto-inoculation
7. Oropharyngeal infection may result from orogenital sex
8. Complications such as urinary retention due to autonomic neuropathy and aseptic meningitis, are occasionally seen

b) Diagnosis

1. Detection of DNA by PCR or tissue culture and typing- swabs taken from vesicular fluid or ulcers
2. Electron microscopy of such material
3. Type specific antibody tests are available but not sufficiently accurate for general use

c) Management

a. First episode

A 5 days regimen of any one of the following (should be started within 5 days of beginning of the episode)

- ✓ Aciclovir 200 mg 5 times daily
- ✓ Famciclovir 250 mg 3 times daily
- ✓ Valaciclovir 500 mg twice daily

- Analgesia may be required
- Saline bathing can be soothing
- Treatment may be continued for longer than 5 days if new lesions develop

b. Recurrent genital herpes

Any one of the following- 5 days regimen

- ✓ Aciclovir 200 mg 5 times daily
- ✓ Famciclovir 125 – 250 mg 3 times daily
- ✓ Valaciclovir 500 mg twice daily

c) Management in pregnancy

- ✓ If her partner is known to be infected with HSV, a pregnant woman with no previous anogenital herpes should be advised to protect herself during sexual intercourse using condom
- ✓ Genital herpes acquired during the first or second trimester of pregnancy is treated with aciclovir as clinically indicated
- ✓ Third trimester acquisition of infection has been associated with life threatening haematogenous dissemination and should be treated with aciclovir
- ✓ Vaginal delivery should be routine in women who are symptomless in late pregnancy
- ✓ Caesarean section is sometimes considered if there is a recurrence at the beginning of labour, although the risk of neonatal herpes through vaginal transmission is very low
- ✓ Caesarean section is often recommended if primary infection occurs after 34 weeks because the risk of viral shedding very high in labour.

Prevention

STDs can be prevented by:

- Not having sex
- Having sex only with one uninfected person
- Consistently using male latex condoms during sexual activity

✓ Most physicians urge patients to tell their sex partners if they have an STD so that their partners can seek medical attention.

✓ This is done for two reasons. First, some STDs are fairly silent infections and can be passed unnoticed between sex partners. For example, chlamydia may not cause symptoms in all those infected; however, the scarring effect of the bacteria can lead to infertility, especially in women. Second, STDs are seen as threats to public health. With proper identification and treatment, the rates of infection can be reduced.

Screening

Testing for a disease in someone who does not have symptoms is called screening. Most of the time, STI screening is not a routine part of health care, but there are exceptions:

- **Everyone-** The one STI screening test suggested for everyone ages 13 to 64 years, is a blood or saliva test for human immunodeficiency virus (HIV), the virus that causes AIDS.
- **Pregnant women-** Screening for HIV, hepatitis B, *Chlamydia* and syphilis generally takes place at the first prenatal visit for all pregnant women. Gonorrhoea and hepatitis C screening tests are recommended at least once during pregnancy for women at high risk of these infections.
- **Women aged 21 years and older-** The Pap test screens for cervical abnormalities, including inflammation, precancerous changes and cancer, which is often caused by certain strains of human papillomavirus (HPV). Experts recommend that starting at age 21 years women should have a Pap test at least every three years. After age 30 years, women are advised to have an HPV DNA test and a Pap test every five years or a Pap test every three years.
- **Women under age 25 years who are sexually active-** All sexually active women under age 25 years should be tested for *Chlamydia* infection. The *Chlamydia* test uses a sample of urine or vaginal fluid which the patient can collect herself. Some experts recommend repeating the *Chlamydia* test three months after a patient had a positive test and been treated. The second test is needed to confirm that the infection is cured as reinfection by an untreated or undertreated partner is common. A bout of *Chlamydia* does not protect one from future exposures. One can catch the infection again and again, so should get retested if she has a new partner. Screening for gonorrhoea also is recommended in sexually active women under age 25 years.
- **People with HIV-** If a person has HIV infection, it dramatically raises his/ her risk of catching other STIs. Experts recommend immediate testing for syphilis, gonorrhoea, *Chlamydia* and herpes after being diagnosed with HIV.

People with HIV should also be screened for hepatitis C. Women with HIV may develop aggressive cervical cancer, so they should have a Pap test within a year of being diagnosed with HIV and then again six months later.

- **People who have a new partner-** Before having vaginal or anal intercourse with new partners, be sure both the partners been tested for STIs. Keep in mind that human papillomavirus (HPV) screening is not available for men. No good screening test exists for genital herpes for either sex, so a person may not be aware if he/she is infected until having symptoms. It is also possible to be infected with an STI yet still test negative, particularly if the person recently been infected.

HIV/ AIDS

Definition

Suspected case

AIDS may be considered if a person has at least **two major signs*** are associated with at least **one minor sign****, in the absence of other known causes of immunosuppressant such as cancer, severe malnutrition or other recognized aetiologies.

Confirmed case

- A suspected case with diagnosis confirmed by laboratory tests,***
- The presence of generalized Kaposi's sarcoma or Cryptococcal meningitis is sufficient by itself for the diagnosis of AIDS.

*** Major signs:**

- Weight loss (> 10 percent of the body weight)
- Chronic diarrhoea for longer than one month
- Prolonged fever for longer than one month (intermittent or continuous)

****Minor signs:**

- Persistent cough for longer than one month
- Generalized pruritic dermatitis (itching and inflamed skin)
- Recurrent herpes zoster (also sometimes called shingles)
- Oropharyngeal candidiasis
- Chronic progressive and disseminated herpes simplex
- Generalized lymphadenopathy

***Laboratory tests**

I. Tests for HIV antibody detection

a) Screening test

- o Enzyme linked immunosorbent assay (ELISA)
- o Immuno chromatographic test (ICT)

b) Confirmatory test

- o Western blot
- o Immuno fluorescent assay (IFA)

II. Test for detection of Virus or its nucleic acid

- o Virus culture
- o Polymerase chain reaction (PCR)

III. Others: for follow up of HIV positive individuals

- o Total lymphocyte count
- o CD4 T- lymphocyte count
- o Viral load estimation

Management of HIV positive individuals

In patients with newly diagnosed HIV infection, the initial emphasis should be on:

- o Counseling with regard to the disease process
- o Limiting the risk of secondary transmission
- o Ensuring that there is proper support for the patient
- o Building a trusting relationship between the patient and the caregiver
- o Appropriate antiretroviral therapy for AIDS patient and to HIV positive pregnant lady and to her baby.
- o Support of occupational and post exposure prophylaxis (PEP).

Aims of HIV treatment:

- o Reduction of the viral load to an undetectable level (< 50 copies/ml) for as long as possible
- o Improvement of the CD4 count (above 200 cells/mm^3 significant HIV-related events rarely occur)
- o Increase the quantity and improve the quality of life without unacceptable drug-related side effects or lifestyle alteration
- o Reduction of transmission (mother to child and person to person)
- o Management of HIV associated illness. eg- mucocutaneous, gastrointestinal, liver, respiratory and CNS diseases

Currently available antiretroviral drugs:

1. Nucleoside reverse transcriptase inhibitors (NRTIs) eg- Zidovudine (ZDV), Lamivudine (3TC)
2. Non-Nucleoside reverse transcriptase inhibitors (NNRTIs) eg- Nevirapine, Delavirdine
3. Protease inhibitors (PIs) eg- Indinavir, Ritonavir, Nelfinavir
4. Others eg- Tenofovir, Enfuvirtide (T-20)

Post exposure prophylaxis (PEP):

- Combination therapy is now recommended for occupational and post exposure prophylaxis (PEP)
- The first dose should be given as soon as possible
- PEP is being used in non-occupational settings eg- condom breakage in HIV- sero discordant partners, victims of rape, relapse in IDUs, sharps-related home exposures in families of HIV patients
- Recommended PEP is ZDV, Lamivudine (3TC) and Indinavir or Nelfinavir for 28 days

Prevention and Control

- Voluntary counseling and testing (VCT)
- Creating awareness on HIV/AIDs and its transmission
- Promotion of safe sex
- Safe blood transfusion
- Registration of sex workers
- Upholding religious and social values

Voluntary counseling and testing (VCT):

For HIV prevention and HIV care voluntary counseling and testing (VCT) plays an essential role. VCT is a public health strategy aimed to reduce HIV transmission on a voluntary basis and increases people's access to knowledge and understanding of HIV status. VCT promotes and sustains behaviour change.

Objectives of VCT

- To promote change in sexual behaviour that reduces the risk of acquiring HIV infection
- To identify those, who need specialized HIV care and support, including ART and opportunistic infections treatment

A counselor might be a doctor, nurse or social worker or may be selected from community members such as teacher, village leader or religious leader (eg- imam or priest) and should be properly trained. With the consent of the client, counseling can be extended to spouses, sex partners and other persons considered important by the client.

VCT includes:

1. Pre-test counseling
2. Voluntary and confidential HIV testing
3. Post test counseling

1. Pre-test counseling:

- Discuss purpose of tests
- Carry out risk assessment
- Explore knowledge and explain natural history of HIV
- Discuss transmission and risk reduction
- Assess likely coping strategy
- Explain test procedure
- Obtain informed consent

2. Post test counseling:

a) Test result negative:

- Discuss transmission and need for behaviour modification, such as safer sex, needle exchange
- Advice second test 3 months after last exposure
- Support if uninfected partner

b) Test result positive:

- Explain significance and implications of results e.g. fear of disclosure, discrimination, social rejection
- Organize urgent medical follow-up
- Provide verbal and written information
- Discuss confidentiality issues
- Organize emotional and practical support

To create awareness that HIV is usually not transmitted through the following activities:

- Shaking hands, hugging and kissing
- Coughing or sneezing
- Using a public phone
- Visiting a hospital
- Opening a door
- Sharing food, eating or drinking utensils
- Using a drinking fountains
- Using toilets or showers
- Using public swimming pools
- Getting a mosquito or insect bite

SKIN DISEASES

33

Definition

Any problem related to the skin, in which a diagnosis of leprosy has been excluded.

Skin diseases

- Disorders of skin, hair, nails
- Skin diseases rarely cause death
- Important cause of morbidity (symptoms and disfigurement)
- Skin findings may be clue to underlying systemic Illness
- Overlaps with infectious diseases, rheumatology, oncology, genetics, ophthalmology, plastic surgery, endocrinology, gastroenterology etc

Skin diseases may have following symptoms (with some possible causes, they also may be sequele or complications of other diseases)

1. **Itching**
   - Numerous causes
     - ✓ Dry skin
     - ✓ Inflammatory- atopic dermatitis (eczema), psoriasis, lichen planus
     - ✓ Infectious- tinea, scabies, parasitic infestation
     - ✓ Systemic illness: HIV, liver or kidney disease, anaemia
   - Interferes with sleeping, concentration
2. **Pain**
   - Keloid scars
   - Inflammatory conditions of skin- lupus, lichen planus of mucosa
   - Infectious: herpes simplex
   - Ulcers
3. **Disfigurement**
   - Abnormal appearance of skin
   - Scars- from disease or scratching
   - Pigmentary changes
4. **Stigma**
   - Interference with personal/ vocational/ social relationships
5. **Reminders of past trauma**
   - Scars or exacerbation of skin disease in survivors of torture
6. **Communicable disorders**
   - Scabies
   - Tinea
7. **Sequelae of cosmetic practices**
   - Exogenous ochronosis with overuse of hydroquinone
   - Topical steroids in skin lightening creams
   - Henna tattoos adulterated with black dye

8. Sequelae of self treatment with medications obtained without prescription

- Potent topical corticosteroids
  - ✓ Skin thinning, loss of pigment, acne, exacerbation of infections

9. Complications of overuse of high potency topical corticosteroids

- Tinea
- Scabies
- Pyoderma
- Steroid acne
- Striae

Some common skin problems

Scabies

Scabies is a common, highly contagious and very itchy skin condition caused by tiny mites called *Sarcoptes scabiei*. It is not an infection, but an infestation that can lead to secondary infections. It can affect people of any age but is most common in the young and the elderly.

Cause/ transmission of scabies

- The mites that cause scabies are tiny parasites, smaller than a pinhead
- They are usually picked up by direct skin to skin contact with someone who already has scabies and only very rarely from objects such as clothing or bedding
- Scabies is easily transmitted to household members and sexual partners
- Scabies also gets transmitted when people live in close contact with one another in crowded conditions such as schools, nursing homes and prisons
- Pets do not spread scabies
- Being dirty does not cause scabies

Diagnosis of scabies

A) Clinical features:

After a person is exposed to scabies, it can take four to six weeks before the symptoms start appearing. This is because the symptoms are mostly caused by an allergic reaction to the mites, their saliva, eggs or waste products. Clinical features of scabies are:

1. Itching

- o Itching is the main symptom of scabies, usually starting about a month after the mites were picked up
- o The itching affects the body and limbs but usually spares the head and necks, except in infants

- The itch often gets worse in bed at night
- It is common for several people in the same family and their friends to become itchy at roughly the same time

2. Skin manifestations/ rash

- The rash of scabies is a mixture of scratch marks and red scaly areas, later it can become infected and develop small pus spots
- The scabies mites burrow into the skin to lay their eggs. Burrows appear as small greyish lines on the skin
- Adult mites are tiny, only about 0.4 mm long, appearing through a lens as a tiny dark dot lying at the end of the borrow
- People with scabies have an average of about a dozen adult mites on their skin, a few carry many more. Rarely a variant of scabies called crusted scabies can occur in patients who are immunosuppressed or who are elderly and unwell. There are thousands of scabies mites on the skin in this variant and it is highly contagious. In crusted scabies the rash may mimic psoriasis and may not cause intense itching

Table- 33.1 : Common infected sites of lesions of scabies

Older children and adults	Babies and young toddlers
• Between finger webs	• Head
• Flexor surface of the wrist and elbow	• Face
• Axillary folds	• Neck
• Nipple	• Palms
• Genital area (male)	• Soles
• Beltline	
• Waist and buttocks	

B) Confirmatory diagnosis

Scabies is usually diagnosed clinically. The confirmatory diagnosis is made by identifying the scabietic burrow and visualizing the mites (by extracting with a needle or using a dermatoscope)

Management

1. General measures

- Washing of all clothing with boiled water

2. Specific measures

- Topical scabicidal (two applications 1 week apart of an aqueous solution of permethrin or malathion) all of the skin below the neck should be applied. The medicine is applied at night when the mites are most active and it is washed off on the following morning
- Reapply scabicide to hand if wash during treatment period

- All closed contacts should be treated in the same time even if asymptomatic to ensure eradication
- Patient should be warned that the pruritus may persist for up to 4 weeks after successful treatment
- If there is poor compliance, immunosuppression or heavy infestation (crusted 'Norwegian' scabies), systemic treatment with single dose of Ivermectin (200µgm/kg) is sometimes appropriate.

Some common topical scabicidal medicines

- 5% Permethrin cream
- 25% Benzyl benzoate lotion
- 10% Sulfur ointment
- 10% Crotamiton cream
- 1% Lindane lotion

Complications

- Acute glomerulonephritis
- Exfoliative dermatitis
- Impetigo
- Boil
- Urticaria

Fungal infections

- Fungal skin infections can be superficial (dermatophytes and yeasts) or less commonly, deep (chromomycosis or sporotrichosis); the latter are more often seen in tropical climates or in the immuno-compromised.
- Dermatophytes infections (ring worm) are extremely common and usually caused by the fungi of the *Microsporum*, *Trichophyton* and *Epidermophyton* species.
- The fungi originate from soil (geophilic) or animals (zoophilic) or be confined to human skin (anthropophilic)
- Dermatophyte infections usually present with skin (tinea corporis), scalp (tinea capitis), groin (tinea cruris), foot (tinea pedis) and/or nail (tinea unguium/ onychomycosis) involvement
- Less commonly, there are also more serious fungal infections that develop deep inside the body tissues, which may need to be treated in hospital. Examples include:
    - ✓ Aspergillosis, which affects the lungs
    - ✓ Fungal meningitis, which affects the brain

People who are at risk

- Fungal infections are common in humans and are usually not very serious if they are treated quickly and correctly.
- Anyone with a weakened immune system may be more likely to contract a fungal infection, as well as anyone who is taking antibiotics.
- Cancer treatment and diabetes may also make a person more prone to fungal infections.

Different types of fungal infections with their clinical presentations

1. Tinea corporis
a. Tinea corporis or ringworm is a skin infection caused by a fungus that lives on dead tissues, such as the skin, hair and nails. b. Typical lesions are erythematous, annular and scaly rash, with well defined edge and central clearing c. There may also be pustules at the active edge d. Lesions are usually asymmetrical and may be single or multiple e. The degree of inflammation is dependent on the organism involved and the host immune response f. Ringworm is highly contagious and it can be transmitted by skin-to-skin contact or from contact with pets, such as dogs g. The fungus may also survive on objects, such as towels, clothes and brushes h. The ringworm fungus also infects soil and mud, so people who play or work in infected dirt may catch ringworm as well.
2. Tinea capitis (Ring worm of the scalp)
a. It is most common among the children b. The most common symptom of ringworm is itchy patches on the scalp. Sections of hair may break off near the scalp, leaving scaly, red areas or bald spots. The patient may see black dots where the hair has broken off. Left untreated, these areas can gradually grow and spread c. Other symptoms include: • Brittle hair • Painful scalp • Swollen lymph nodes • Low-grade fever d. In more severe cases, patient may develop crusty swellings called kerion that drain pus. These can lead to permanent bald spots and scarring.

3. Tinea cruris (Jock itch)

Tinea cruris, also known as crotch itch, crotch rot, Dhobi itch, eczema marginatum, gym itch, jock itch, jock rot, scrot rot and ringworm of the groin is a dermatophyte fungal infection of the groin region in any sex, though more often seen in males. Features of tinea cruris are:

a. It presents as large round, red, well-defined patches on the upper inner thigh and groin area
   - o Genitals spared
   - o Bilateral due to skin-on-skin contact of upper thighs and groin
   - o Reddened areas can extend down inner leg or upwards to abdomen or buttocks

b. Edges are bumpy or scaling

c. Burning and itching are common

d. Often co-morbid with tinea pedis and tinea unguium (toe-nail infection)

4. Tinea paedis (athlete's foot)

This is the most common fungal infection

- **People who are at risk-** Anyone can get athlete's foot, but certain behaviours increase the risk. Factors that increase the risk of getting athlete's foot include:
  - Visiting public places barefoot, especially locker rooms, showers and swimming pools
  - Sharing socks, shoes or towels with an infected person
  - Wearing tight-fitting, closed-toe shoes
  - Keeping feet wet for long periods of time
  - Having sweaty feet
  - Having a minor skin or nail injury on foot

- **Clinical features-** There are many possible symptoms of athlete's foot, which include:
  a. Itching, stinging and burning between the toes
  b. Itching, stinging and burning on the soles of the feet
  c. Blisters on the feet that itch
  d. Cracking and peeling skin on the feet, most commonly between the toes and on soles
  e. Dry skin on the soles or sides of the feet
  f. Raw skin on the feet
  g. Discolored, thick and crumbly toenails
  h. Toe nails that pull away from the nail bed

5. Tinea unguium (Onychomycosis)

- **Fungal nail infections**, medically known as onychomycosis, refers to a fungal infection of the toenails or fingernails especially toenail infections, can be contagious person to person from direct and indirect contact with an infected person or their clothing, such as wearing an infected person's shoes or socks.
- **Risk factors** for fungal nail infection include
  - Family history, advancing age, poor health, trauma
  - Living in a warm climate
  - Participation in fitness activities
  - Immunosuppression (can occur from HIV or certain drugs)
  - Bathing in communal showers
  - Wearing shoes that cover the toes completely and do not let in any airflow.
- **Clinical features-**

  Fungal infection of the nails may cause changes in the nail itself and its appearance, including symptoms and signs such as
  - Yellow/ brown nail discoloration
  - Crumbling
  - Thickening
  - Subungual hyperkeratosis

  Fungal nail infection usually does not cause any symptoms (painless) unless the nail becomes so thick, then it causes pain when wearing shoes. Fungal nails may appear brittle, broken and lifted or separated from the nail bed. Changes in the nail appearance are typically the first signs and symptoms of fungal nails. In severe cases, fungal nails can cause problems while standing, walking and exercising. People with fungal nail infection usually go to the doctor for cosmetic reasons, not because of physical pain or problems related to fungal nail infection.

Diagnosis of tinea

Diagnosis is confirmed by microscopy and culture of the specimen collected from skin scrapings, hair plucking or nail clippings, which must be taken from areas of disease activity, typically the advancing lesion edge

Treatment of tinea

1. Topical antifungals (eg- Terbinafine or miconazole) may suffice
2. Systemic antifungal treatment (eg- Terbinafine, griseofulvin or itraconazole) may be required for stubborn or extensive disease and scalp or nail involvement
3. Systemic corticosteroids- in addition to systemic antifungals, a short course of systemic corticosteroid may be required for kerion to limit hair loss

Prevention of tinea

1. **Tinea corporis** is prevented by keeping body clean and dry. It is easily spread, so sharing towels, combs or other personal items should be avoided
2. **Tinea capitis (Ring worm of the scalp)** can be prevented by the following steps:
   - Cleaning hair regularly using shampoo
   - Do not share headgear, brushes or combs with others
   - Wash towels, clothes and any shared items used by an infected person to prevent spreading it to others in the household
   - Taking pets to the veterinarian for treatment if they develop skin rashes
3. **Tinea cruris (Jock itch)** can be prevented by keeping groin clean and dry; changing into dry, clean clothes and underwear every day; and avoiding tight clothing
4. **Tinea paedis (Athlete's foot)** can be prevented by wearing shower shoes, washing feet daily, drying them well and wearing clean socks
5. **Tinea unguium (Onychomycosis)-** prevented by keeping hands and feet clean and dry, wearing dry socks and changing them often, wearing shoes in a public shower, pool and not scratching infected skin, such as athlete's foot. Wear wide-toed shoes (so toes are not crammed together) and do not share nail clippers
6. **Hygiene at home and gym-** To prevent fungal infections, the best defense is to keep skin clean and dry. Change underwear and socks daily. Let sneakers air out and wash them regularly. Take shoes off at home to expose feet to the air. Change out of gym clothes right after a workout. Wash exercise clothes after each use. Wear clean clothes before each workout. Do not share workout mats or towels

Pityriasis versicolor

- Pityriasis versicolor, also called tinea versicolor, is a common condition that causes small patches of skin to become scaly and discoloured. The patches are usually lighter or may be darker than normal skin colour or may be red or pink. They tend to develop gradually and may join up to form larger patches over time.
- The areas which most often affected by pityriasis versicolor include the trunk (chest and abdoman), neck, upper arms and back.
- Although it may look unpleasant and the patches are itchy, pityriasis versicolor is harmless.

Why it happens

Pityriasis versicolor is caused by a type of yeast called *Malassezia furfur*. This yeast is found on the skin of more than 90% of adults, where it normally lives without causing any problems. But pityriasis versicolor can develop if this yeast starts to multiply more than usual. It is not clear exactly why this happens in some people and not in others.

Several factors can increase the risk of developing pityriasis versicolor, including:

- Living or staying in a warm, moist environment
- Sweating excessively (hyperhidrosis)
- Having naturally oily skin
- Being a teenager or in early 20s

Pityriasis versicolor is not related to poor hygiene. The condition cannot be spread from person to person because most people already have the *Malassezia* yeast on their skin. The disease is usually more severe and persistent in immunocompromised.

Treatment

Pityriasis versicolor can be treated with antifungal medicines (shampoos, creams and tablets)

1. Antifungal shampoos

- ✓ Antifungal shampoos (such as ketoconazole or selenium sulphide shampoo) are often the first treatment recommended for pityriasis versicolor
- ✓ In most cases, these shampoos need to be applied to the affected areas of skin and left for 5 to 10 minutes before being rinsed off. This usually needs to be repeated every day for 5 to 7 days
- ✓ The patient may experience some skin irritation or a burning sensation when using these shampoos, particularly selenium sulphide
- ✓ It may be helpful to dilute the shampoo with water before applying it. Some people also find the odour of selenium sulphide shampoo unpleasant

2. Antifungal creams

- ✓ If only small areas of skin are affected, the patient may be prescribed an antifungal cream. These creams usually need to be applied to the affected area of skin once or twice a day for several weeks
- ✓ Some people experience a burning sensation when they use these antifungal creams, but this is uncommon

3. Antifungal tablets

- ✓ If a large area of skin is affected or other treatments have not helped, the patient may be prescribed antifungal tablets. These usually need to be taken once a day for 1 to 4 weeks

✓ Side effects of these tablets are uncommon, although some people experience problems such as rashes, feeling sick and abdominal pain while taking them

Candidiasis

Candidiasis is a fungal infection caused by yeasts that belong to the genus *Candida*. There are over 20 species of *Candida* yeasts that can cause infection in humans, the most common of which is *Candida albicans*. *Candida* yeasts normally reside in the intestinal tract and can be found on mucous membranes and skin without causing infection; however, overgrowth of these organisms can cause symptoms to develop.

Types of candidiasis

1. Candida infections of the mouth, throat, and oesophagus
2. Vaginal candidiasis
3. Invasive candidiasis

1. Candida infections of the mouth, throat and oesophagus

Candidiasis in the mouth and throat is also called "thrush" or oropharyngeal candidiasis. Candidiasis in the oesophagus (the tube that connects the throat to the stomach) is called oesophageal candidiasis or *Candida* oesophagitis. Oesophageal candidiasis is one of the most common infections in people living with HIV/AIDS.

Symptoms

Candidiasis in the mouth and throat can have many different symptoms, including:

- White patches on the inner cheeks, tongue, roof of the mouth and throat
- Redness or soreness
- Cottony feeling in the mouth
- Loss of taste
- Pain while eating or swallowing
- Cracking and redness at the corners of the mouth
- Symptoms of candidiasis in the oesophagus usually include pain when swallowing or difficulty in swallowing

People who are at risk

Candidiasis in the mouth, throat or oesophagus is uncommon in healthy adults. People who are at higher risk for getting candidiasis in the mouth and throat include babies, especially those younger than one month old and people who:

- Wear dentures

- Have diabetes
- Have cancer
- Have HIV/AIDS
- Take antibiotics or corticosteroids, including inhaled corticosteroids for conditions like asthma
- Take medications that cause dry mouth or have medical conditions that cause dry mouth
- Smoking
- People who get candidiasis in the oesophagus often also have candidiasis in the mouth and throat

Prevention

- Maintain good oral health
- Rinsing of mouth or brushing teeth after using inhaled corticosteroids
- Some studies have shown that chlorhexidine mouthwash may help to prevent oral candidiasis in people undergoing cancer treatment

Diagnosis

- Usually diagnosis of candidiasis in the mouth or throat is made simply by looking inside. Sometimes a small sample from the mouth or throat is collected and is sent to a laboratory for microscopic examination
- Diagnosis of candidiasis in the oesophagus is done by doing an endoscopy

Treatment

Candidiasis in the mouth, throat or esophagus is usually treated with antifungal medicine

- The treatment for mild to moderate infections in the mouth or throat is usually an antifungal medicine applied to the inside of the mouth for 7 to 14 days. These medications include **clotrimazole, miconazole** or **nystatin.**
- For severe infections, the treatment is usually **fluconazole** or another type of antifungal medicine given by mouth or through a vein for people who do not get better after taking fluconazole. The treatment for candidiasis in the oesophagus is usually fluconazole. Other types of antifungal medicines can also be used for people who cannot take fluconazole or who do not get better after taking fluconazole.

2. Vaginal Candidiasis

Discussed on ***Sexually Transmitted Disease/STI*** section

3. Invasive candidiasis

- Invasive candidiasis is an infection caused by a yeast (a type of fungus) called *Candida*. Unlike *Candida* infections in the mouth and throat (also called thrush) or vaginal yeast infections, which are localized to one part of the body; invasive candidiasis is a serious infection that can affect the blood, heart, brain, eyes, bones or other parts of the body.
- Invasive candidiasis can be treated with antifungal medication and antifungal medication is often given to prevent the infection from developing in certain patient groups.

Symptoms

- People who develop invasive candidiasis are often already sick from other medical conditions, so it can be difficult to know which symptoms are related to a *Candida* infection
- The most common symptoms of invasive candidiasis are fever and chills that do not improve after antibiotic treatment for suspected bacterial infections
- Other symptoms can develop if the infection spreads to other parts of the body, such as the heart, brain, eyes, bones or joints

People who are at risk

Most cases of invasive candidiasis occur in people who have recently been admitted to a hospital or been in contact with other healthcare settings such as nursing homes. People who are at high risk for developing invasive candidiasis include-

- Patients who have a central venous catheter
- Patients in the intensive care unit (ICU)
- People who have weakened immune systems (for example, people who have had an organ transplant, have HIV/AIDS or are on cancer chemotherapy)
- People who have taken broad-spectrum antibiotics
- People who have a very low neutrophil (a type of white blood cell) count (neutropenia)
- People who have kidney failure or are on haemodialysis
- Patients who have had surgery, especially gastrointestinal surgery
- Patients who have diabetes

Is invasive candidiasis contagious?

Invasive candidiasis does not spread directly from person to person. However, some species of the fungus that causes invasive candidiasis normally live on skin, so it is possible that *Candida* can be passed from one person to another and possibly cause an infection in someone who is at high risk.

How can invasive candidiasis be prevented?

- Antifungal medication: If a person is at high risk for developing invasive candidiasis, healthcare provider may prescribe antifungal medication to prevent the infection. This is called antifungal prophylaxis and it is typically recommended for-
  - Some organ transplant patients
  - High-risk ICU patients
  - Chemotherapy patients who have neutropenia
  - Stem cell transplant patients who have neutropenia
- Some doctors may also consider giving antifungal prophylaxis to very low birth weight infants (less than 2.2 pounds) in nurseries with high rates of invasive candidiasis

Diagnosis

Healthcare providers rely on medical history, symptoms, physical examinations and laboratory tests to diagnose invasive candidiasis. The most common way that healthcare providers test for invasive candidiasis is by taking a blood sample and sending it to a laboratory to see if it will grow *Candida* in a culture.

Treatment

- The specific type and dose of antifungal medication used to treat invasive candidiasis usually depends on the patient's age, immune status and location and severity of the infection. For most adults, the initial recommended antifungal treatment is an **echinocandin (caspofungin, micafungin or anidulafungin**) given through the vein (intravenous or IV). Fluconazole, amphotericin B and other antifungal medications may also be appropriate in certain situations
- For candidemia, treatment should be continued for 2 weeks after signs and symptoms have resolved and *Candida* yeasts are no longer in the bloodstream
- Other forms of invasive candidiasis, such as infections in the bones, joints, heart or central nervous system, usually need to be treated for a longer period of time.

Urticaria/ hives

Urticaria (also known as hives) appear on the skin as wheals that are red, very itchy, smoothly elevated areas of skin often with a blanched center. They appear in varying shapes and sizes, from a few millimeters to several centimeters in diameter anywhere on the body. They appear either as a result of the body's reaction to certain allergens or for unknown reasons.

Urticaria facts

- Urticaria is red, itchy, raised welts on the skin that appear in varying shapes and sizes; each one characteristically lasts no longer than 6 to 12 hours
- Although urticaria is very common and their cause is often elusive
- It can change size rapidly and move around, disappearing in one place and reappearing in other places, often in a matter of hours
- Acute urticaria flare up suddenly
- Occasionally urticaria is produced by direct physical stimulation by environmental forces like heat, cold and sunlight
- Treatment of urticaria is directed at symptom relief until the condition goes away on its own
- Antihistamines are the most common treatment for urticaria
- Urticaria typically is not associated with long-term or serious complications.

Urticaria and angioedema

- It is estimated that 20% of all people will develop urticaria at some point in their lives
- It is more common in women than in men
- One hallmark of urticaria is it's tendency to change size rapidly and to move around, disappearing in one place and reappearing in other places, often in a matter of hours
- An individual lesion of urticaria usually lasts no longer than 24 hours
- Very few skin diseases occur and then resolve so rapidly (Therefore, even if the patient has no evidence of urticaria to show the doctor when he/she visits the doctor for examination, the diagnosis can be established based upon the accurate recounting of the patient's symptoms and signs)
- Swelling deeper in the skin that may accompany urticaria is called angioedema. This swelling of the hands and feet, as well as the face (lips or eyelids), can be as dramatic as it is brief.

What are the different kinds of urticaria?

Urticaria fall into two categories on the basis of the time it has been present

1. **Acute urticaria** (ordinary hives, which resolves within six weeks)
   - Acute urticaria flare up suddenly and usually for no specific reason. Welts appear, often in several places. They flare, itch, swell and go away in a matter of minutes to hours, only to appear elsewhere. This sequence may go on from days to weeks. Most episodes of urticaria last less than six weeks. Although that cutoff point is arbitrary.
   - Since urticaria is so common and acute urticaria, by definition, resolves spontaneously, physicians do not generally expend much time or expense to evaluate the cause if duration is less than six weeks.

2. **Chronic urticaria and angioedema:** Urticaria lasting more than six weeks is chronic urticaria
    - The cause of chronic urticaria is usually more difficult to identify than those causing acute urticaria. For most people with chronic urticaria, the cause is impossible to determine. In some cases, though, the cause may be thyroid disease, hepatitis, infection or cancer
    - Chronic urticaria and angioedema can affect other internal organs such as the lungs, muscles and gastrointestinal tract. Symptoms include muscle soreness, shortness of breath, vomiting and diarrhoea
    - Angioedema is similar to urticaria, but the swelling occurs beneath the skin instead of on the surface. Angioedema is characterized by deep swelling around the eyes and lips and sometimes of the genitals, hands and feet. It generally lasts longer than urticaria, but the swelling usually goes away in less than 24 hours
    - Rarely, angioedema of the throat, tongue or lungs can block the airways, causing difficulty in breathing. This may become life threatening.

Physical urticaria: Urticaria caused by direct physical stimulation of the skin; for example, cold, heat, sun exposure, vibration, pressure, sweating and exercise. It usually occurs right where the skin was stimulated and rarely appear elsewhere. Most of the lesions appear within one hour after exposure.

Dermatographism: This is a common form of physical urticaria where it forms after firmly stroking or scratching the skin. These can also occur along with other forms of urticaria.

Causes of urticaria

- Allergic urticaria and angioedema form when, in response to histamine, blood plasma leaks out of small blood vessels in the skin. Histamine is a chemical released from specialized cells along the skin's blood vessels
- Allergic reactions, chemicals in certain foods, insect stings, sunlight exposure or medications can all cause histamine release. It is often impossible to find out exactly why urticaria has formed.

Causes of urticaria

Acute and chronic urticaria

- Autoimmune: due to antibodies that cross-link the IgE receptor on mast cells
- Allergens: in foods, medications and inhalants
- Drugs: salicylates, opiates, NSAIDs, antibiotics, dextran, ACE inhibitors
- Contacts: eg- latex, animal saliva
- Physical: eg- heat, cold, pressure, sun, sweat, water
- Infection: eg- intestinal parasites
- Others: eg- SLE (systemic lupus erythematosus), pregnancy
- Idiopathic: chronic idiopathic urticaria and angioedema

Urticarial vasculitis

- Idiopathic
- Hepatitis B
- SLE

Other conditions that mimic urticaria

There are other rashes that may look like urticaria, but the fact that they remain stable and do not resolve within 24 hours is helpful in distinguishing them from urticaria. Such rashes may need to have a small specimen of skin removed and examined under the microscope (biopsy) to accurately determine the nature of the skin disease.

Diagnosis of urtiacaria and angioedema

Physician needs to ask many questions in an attempt to find the possible cause of urticaria or angioedema. Since there are no specific tests for urticaria or the associated swelling of angioedema, testing will depend on medical history and a thorough examination by primary care doctor or dermatologist.

Then investigations should be guided by the history and possible causes. Some or all of the following investigation may be appropriate

- **Full blood count-** eosinophilia in parasitic infection or drug cause
- **Erythrocyte sedimentation rate (ESR)** or plasma viscosity- elevated in vasculitis
- **Urea** and **electrolytes, thyroid** and **liver function tests, iron studies-** may reveal an underlying systemic disorder
- **Total IgE and specific IgE to** possible allergens- shellfish, peanut, house dust mite
- **Antinuclear factor-** positive in SLE and often positive in urticarial vasculitis
- **Complement C3 and C4 level**
- **Skin biopsy-** if urticarial vasculitis is suspected
- **Challenge test-** to confirm physical urticaria

Treatment

- The best treatment for urticaria and angioedema is to identify and remove the trigger, but this is not an easy task. **Antihistamines** are usually prescribed by doctor to provide relief from symptoms. **Antihistamines** work best if taken on a regular schedule to prevent urticarial rash from forming in the first place.
- Chronic urticaria may be treated with **antihistamines (fexofenadine, loratadine, cetrizine)** or a combination of medications. **Mast cell stabilizers or leukotriene receptor antagonists,** such as **montelukast**, may be added for recalcitrant disease. **Systemic corticosteroids** may be prescribed. A biologic drug, **omalizumab**, is also approved to treat chronic urticaria in those at least 12 years of age.
- For severe urticaria or angioedema outbreaks, an injection of epinephrine (adrenaline) or a cortisone medication may be needed.

- While waiting for urticaria and swelling to disappear, here are some tips:
    - ✓ Apply cool compresses or wet cloths to the affected areas
    - ✓ Try to work and sleep in a cool room
    - ✓ Wear loose-fitting lightweight clothes

Urticaria always cannot be prevented

Urticaria occurs when something causes high levels of histamine and other chemicals to be released in the skin. This is known as **a trigger.** The patient should try to identify and remove the **trigger**.

Triggers include:

- Food
- Pollen and plants
- Insect bites and stings
- Chemicals
- Latex
- Dust mites
- Heat- work and sleep in a cool room and wear loose, lightweight clothes
- Sunlight, exercise or water
- Medicines- consult with physician whether the patient has an allergic condition
- Infections
- Emotional stress

When to visit the doctor

If urticaria is making it difficult to sleep, then it may be necessary to see a physician. This would be especially important if the patient is taking nonprescription antihistamines. If urticaria lasts longer than two months, it is also likely the patient will be benefitted from visiting a physician.

If urticaria or angioedema occur with any of the following symptoms, contact physician right away:

- Dizziness or fainting
- Wheezing
- Difficulty in breathing
- Tightness in the chest
- Difficulty in swallowing
- Nausea or vomiting
- An increased heart rate
- Rapid and severe swelling of the face, mouth or throat

These could be signs of a severe allergic reaction, such as **anaphylactic shock.**

Eczema

- The terms 'eczema' and 'dermatitis' are synonymous. They refer to distinctive reaction patterns in the skin, which can be either acute or chronic and are due to a number of causes.
- Acutely, epidermal oedema (spongiosis) and intra-epidermal vesiculation (producing multilocular blisters) predominate, whereas with chronicity there is more epidermal thickening (acanthosis).
- Vasodilatation and T-cell lymphocytic infiltration of the upper dermis also occur.

Clinical features

There are several patterns of eczema and environmental causes may be identifiable. The clinical features are similar, irrespective of the cause.

Table- 33.2 : Classification of eczema
Endogenous • Atopic, seborrhoeic
Exogenous • Irritant, allergic, photoallergic, chronic actinic dermatitis
Characteristic pattern and morphology • Asteatotic, discoid, gravitational, lichen simplex, pompholyx

Table- 33.3 : Clinical morphology of eczema
Acute • Erythema, oedema, usually typically ill-defined • Papules, vesicles and occasionally bullae • Exudation, fissuring • Scaling
Chronic • May be as above but less oedema, vesiculation and exudates • Lichenification: skin thickening with pronounced skin markings, secondary to chronic rubbing and scratching • Fissures, excoriations • Dyspigmentation: hyper and hypo pigmentations can occur

1) Atopic eczema

- Generalized, prolonged hypersensitivity to common environmental antigens such as pollen and house dust mites
- Genetic predisposition of excess IgE production
- Atopic individuals manifest one or more of a group diseases that includes asthma, hay fever, food and other allergies
- The diagnosis of atopic eczema is made using clinical criteria

Table- 33.4 : **Diagnostic criteria for atopic eczema**
Pruritus and atleast three of the followings are required ✓ History of itch on the creases (or cheeks if < 4 years) ✓ History of asthma/ hay fever (or in a first-degree relative if < 4 years) ✓ Dry skin (xeroderma) ✓ Visible flexural eczema (cheeks, forehead, outer limbs if < 4 years) ✓ Onset in first 2 years of life

Clinical features

- Atopic eczema is extremely itchy and scratching accounts for many of the signs
- Widespread cutaneous dryness (roughness) is another feature
- The distribution and character of the rash vary with age are as below

Table- 33.5 : **Atopic eczema: distribution and character of rash**
Babies and infants ✓ Often acute and facial involvement prominent ✓ Trunk involved but nappy area usually spared **Children** ✓ Flexures: behind knees, antecubital fossae, wrists and ankles **Adults** ✓ Face and trunk usually involved, limb involvement is not restricted to flexures ✓ Lichenification is common

2) Seborrhoeic eczema

- This is an erythematous scaly rash affecting the scalp (dandruff), central face, nasolabial folds, eyebrows, central chest and upper back
- It is associated with and may be due to *Pityrosporum* yeasts
- When severe, it may resemble psoriasis
- Severe or recalcitrant seborrhoeic eczema can be a marker of immunodeficiency, including HIV infection

3) Irritant eczema

- Detergents, alkalis, acids, solvents and abrasives are common irritants
- Strong irritants have acute effects, whereas weaker irritants commonly causes chronic eczema, especially of the hands, after prolong exposure

- Individual susceptibility varies and the elderly, atopic and fair-skinned are predisposed
- Irritant eczema accounts for most occupational cases of eczema and is a significant cause of time off work

4) Allergic contact eczema

- This occurs due to delayed hypersensitivity reaction following contact with antigens or haptens
- Previous allergen exposure is required for sensitization and reaction is specific to the allergen or closely related chemicals
- Common allergens are-

Table- 33.6 : Common type IV delayed hypersensitivity allergens

Allergen	Source
Nickel	Jewellery, jean studs, bra clips, watches
Dichromate	Cement, leather, matches
Rubber chemicals	Clothing, shoes, rubber gloves, tyres
Colophony	Sticking plaster, collodion, nail varnish
Paraphenylenediamine	Hair dye, clothing, tattoos
Balsam of Peru	Perfumes, citrus fruits, shower/ bath products
Neomycin, benzocaine	Topical medications
Parabens	Preservatives in cosmetics and creams
Wool alcohols	Lanolin, cosmetics, creams
Epoxy resin	Resin adhesives, glues

- Allergy persists indefinitely and eczema occurs at sites of allergen contact and can secondarily spread beyond this. There are many recognizable patterns, eg- eczema of the earlobes, wrists and umbilicus due to contact with nickel in earrings, watches and jeans studs or eczema of the hands and wrists due to rubber gloves. Oedema may also be a feature.

5) Gravitational (stasis) eczema

✓ This occurs on the lower legs and is often associated with signs of venous insufficiency: oedema, loss of hair, induration, lipodermato-sclerosis and ulceration.

Treatment

A. General management of eczema

1. Explanation and reassurance of the patient
2. Avoidance of contact with irritant

3. Regular use of emollients (eg- emulsifying ointment) is the mainstay treatment in all eczema types. Emollients are used as bath additives and soap substitutes and directly on the skin and often combined with antiseptics
4. Appropriate use of topical corticosteroids-
   - ✓ Ointments are preferred for chronic eczema, whereas cream or lotion-based treatment may be more appropriate for acute eczema
   - ✓ Treatment is once to twice daily
   - ✓ Hydrocortisone (1%) or clobetasone butyrate is generally used on the face, with potent or very potent corticosteroid use restricted to trunk and limbs
   - ✓ Very potent corticosteroids should not be used for long-term
   - ✓ Particular care should be taken on certain sites, such as the face and flexures and in children and the elderly
   - ✓ The least potent corticosteroid that is effective should be used for shortest possible time
   - ✓ The topical calcineurin inhibitors: tacrolimus and pimecrolimus, may be useful steroid-sparing agents, particularly on face
5. Sedative antihistamines are useful if sleep is interrupted, but non sedative antihistamines are ineffective

B. Specific measure

1. Atopic eczema

- Topical treatment with a variety of bandaging (tar and ichthammol paste)
- Avoidance of allergen
- Treatment of secondary infection
- Topical calcineurin inhibitors may be applied
- Systemic immunosuppression with intermittent ciclosporin, oral corticosteroids, azathioprine or methotrexate may be needed
- Phototherapy, usually with narrowband UVB, is generally the next step, if topical therapies are insufficient
- PUVA or UVA1 is sometimes used

2. Seborrhoeic eczema

- Ketoconazole shampoo and cream
- Often combined with mild corticosteroids

3. Irritant eczema

- Avoidance of irritant, including protective clothing (eg- gloves)
- Emollients and topical corticosteroids are indicated

4. Allergic contact eczema

- Allergen avoidance may involve change of occupation or hobbies
- Treatment with emollients or topical corticosteroids

5. Gravitational (stasis) eczema

- Topical corticosteroids should be applied to eczematous areas but not ulcers
- Oedema and ulceration are treated by leg elevation and compression bandage
- There is a high risk of sensitization of topical preservatives (eg- chlorocresol), antibiotics (eg- neomycin) and bandages (eg- rubber additives)

Psoriasis

- Psoriasis is a chronic inflammatory, hyperproliferative skin disease, characterized by well-defined, erythematous scaly plaques, particularly affecting extensor surfaces, scalp and usually follows a relapsing and remitting course
- It affects approximately 1.5 – 3% of Caucasians
- It occurs equally in both sexes at any age, although uncommon under the age of 5 years
- The pathogenesis of psoriasis is multifactorial; genetic and environmental factors are important

Table- 33.7 : Exacerbating factors of psoriasis

Trauma

- ✓ Psoriatic lesions can appear at sites of skin trauma, such as scratches or surgical wounds (Kobner isomorphic phenomenon)

Infection

- ✓ β-haemolytic streptococcal throat infections often precede guttate psoriasis
- ✓ Severe psoriasis may be the initial presentation of HIV infection

Sunlight

- ✓ A minority of patients experience exacerbation of psoriasis after sun exposure, at site of sunburn or polymorphic light eruption

Drugs

- ✓ Antimalarials, beta-adrenoceptor antagonists (beta-blockers), lithium, NSAIDs and anti TNF-α drugs, such as infliximab etc can exacerbate psoriasis
- ✓ Rebound flare of psoriasis may occur after withdrawal of systemic corticosteroids or potent topical corticosteroids

Psychological factors

- ✓ Anxiety and stress may exacerbate psoriasis in predisposed individuals

Clinical features

- Psoriasis may not have any associated symptoms but it can be itchy and painful. Certain sites such as the scalp, lower legs and groin can be particularly itchy. If psoriasis affects hands and feet, painful fissures or cracks can develop and these can affect the use of hands and walking. Severe psoriasis on the body can also develop fissures which are painful and can bleed
- The skin changes of psoriasis (often known as plaques) are **pink or red areas with silvery-white scales**
- Psoriasis can affect the nails and lifting of the nail plate from the nail bed can be painful
- Psoriatic arthritis produces pain, swelling and stiffness in one or more joints, particularly in the morning

Table- 33.8 : Four recognized parttens of psoriasis

1. Plaque psoriasis (most common type)

- The typical lesion is a raised **well-demarcated erythematous plaque** of variable size
- In untreated disease, **silver/ white scale** is evident and more obvious on scrapping of the surface
- Sites of involvement
  - ✓ Most common sites are **extensor surfaces**, notably elbows and knees and the lower back
  - ✓ **Scalp** (60% of the patients)- clearly demarcated, easily palpable erythematous scaly plaques are evident. Occipital involvement is common and difficult to treat. Involvement of other '**seborrhoeic sites**' such as eyebrows, nasolabial folds and the pre-sternal area is not uncommon which again may be confused with seborrhoeic dermatitis. Temporary hair loss can occur but permanent loss is unusual
  - ✓ **Nails-** thimble pitting (indentations), onycholysis (separation of the nail from nail bed), subungual hyperkeratosis and periungual involvement
  - ✓ **Flexures-** involve the natal cleft and submammary and axillary folds is usually symmetrical erythematous and smooth, without scale
  - ✓ **Palms-** individual plaque may be poorly demarcated and barely erythematous. Psoriasis of the palms can be difficult to distinguish from eczema

2. Guttate psoriasis

- Commonly seen in children and adolescents and may follow a streptococcal sore throat and rapidly evolves
- Individual lesions are droplet shaped, small (usually less than 1 cm in diameter), erythematous, scaly and numerous

3. Erythrodermic psoriasis

- Generalized erythrodermic psoriasis is a medical emergency
- Skin becomes universally red and scaly
- Shivering compensates for the considerable heat loss

4. Pustular psoriasis

- Generalized pustular psoriasis
  - ✓ Uncommon, unstable and life threatening
  - ✓ Often emerge in the context of plaque disease and the onset is usually sudden, with large numbers of small sterile pustules on an erythematous background, often merging into sheets, with waves of new pustules in subsequent days
  - ✓ The patient is usually febrile and systemically unwell and this must be dealt with as a medical emergency
- Localized pustular psoriasis
  - ✓ Commonly affects palms and soles
  - ✓ Chronic and closely associated with smoking
  - ✓ Small sterile pustules and erythema develop and resolve with pigmentation and scaling
  - ✓ A localized form of sterile pustulosis of few digits can also occur

Arthropathy

- Between 5% and 10% of individuals with psoriasis appear to have a chronic rheumatoid factor negative inflammatory arthropathy
- Approximately 20% of all patient with seronegative polyarthritis have psoriasis
- A wide spectrum of joint disease may occur such as:
  - ✓ Asymmetrical inflammatory oligoarthritis (40%)
  - ✓ Symmetrical polyarthritis (25%)
  - ✓ Predominant distal interphalangeal joint arthritis (15%)
  - ✓ Psoriatic spondylitis (15%)
  - ✓ Arthritism mutilans (5%)

Investigations

- Usually psoriasis is diagnosed clinically
- Throat swab for streptococcal infection in guttate psoriasis
- Skin biopsy rarely done

Treatment

A. General measures

- Explanation, reassurance and instruction are vital
- Avoidance of alcohol

B. Specific treatment

Table- 33.9 : Specific treatments of psoriasis

a. Topical agents

- Emollients, tars, dithranol, vitamin D agonists, retinoids, corticosteroids

b. Phototherapy

- UVB, PUVA (excimer laser)
  - ✓ If topical treatment is insufficient
  - ✓ Patient with guttate psoriasis need phototherapy as a first line approach because of difficulties in topical drug application in extensive disease

c. Systemic agents

- If the patient continues to have active disease or early recurrence, then addition of-
  - ✓ Systemic retinoids **or**
  - ✓ Immunosuppressants, such as **methotrexate** as first choice, then **ciclosporin, mycophenolate, hydroxycarbamide** may be considered
- In severe, unresponsive disease, may require-
  - ✓ Immunomodulators- fumaric acid esters
  - ✓ Biological immunosuppressants: eg- **infliximab, etanercept, adalimumab**
- A patient with extensive chronic plaque psoriasis and significant arthropathy would be better suited to a systemic drug, such as **methotrexate**, than **phototherapy**

d. Intensive inpatient or day-patient care

- Topical agents and photo (chemo) therapies under medical supervision.

Acne vulgaris

- Acne is a chronic inflammation of the pilosebaceous units. The condition is extremely common. It generally starts after puberty and there are reports of it affecting over 90% of adolescents.
- It is usually most severe in the late teenage years but can persist into the thirties and forties, particularly in females.

Pathogenesis of acne

1. Elevated sebum excretion
   - Sebum secretion is necessarily important for the development of acne but is not sufficient for acne on its own

- The main determinant of sebum excretion is hormonal
- Androgen are the principal sebotrophic hormone and oestrogen reduces its excretion

2. Infection with *Propionibacterium acnes* (this bacteria colonized in the pilosebaceous ducts and act on lipid to produce a number of pro-inflammatory factors)
3. Hyper cornification and occlusion of pilosebaceous ducts

Triggers of acne

1. Genetic factors
2. Some medications that contain androgen and lithium
3. Greasy cosmetics
4. Hormonal changes
5. Emotional stress
6. Menstruation

Clinical features

- Acne usually affects the face and often the trunk
- Greasiness of the skin may be obvious (seborrhoea)
- The hallmark is the comedone
  - o Open comedones (**blackheads**) are dilated keratin-filled follicles, which appears as black papules due to keratin debris
  - o Closed comedones (**whiteheads**) usually have no visible follicular opening and are caused accumulation of sebum and keratin deeper in the pilosebaceous ducts
- Inflammatory papules, nodules and cysts occur and may arise from comedones
- Scarring may follow deep-seated or superficial acne and may be keloidal
- There are distinct clinical variants:
  - **o Acne conglobata-** characterized by comedones, nodules, abscesses, sinuses and cysts, usually with marked scarring. It is rare, usually affecting adult males and most commonly occurs on trunk and upper limbs.
  - **o Acne fulminans-** a rare but severe presentation of acne, associated with fever, arthralgia and systemic inflammation with raised neutrophil count and plasma viscosity, usually found in trunk in adolescent males. Costochondritis can occur.
  - **o Acne exocrine-** effects of scratching and pricking of pre-existing or imagined acne lesions. It usually affects teenage girls and underlying psychological problems are common.
  - **o Secondary acne-** comedonal acne can be caused by greasy cosmetics or occupational exposure to oils, tars or chlorinated aromatic hydrocarbons. Predominantly pustular acne can occur in patients using systemic or topical corticosteroids, oral contraceptives, anticonvulsants, lithium or antineoplastic drugs.

- *Most patients with acne do not have an underlying endocrine disorder. However, acne is a common feature of polycystic ovary syndrome, which should be suspected if acne is moderate to severe and associated with hirsutism and menstrual irregularities. Virilisation should also raise suspicion of an androgen-secreting tumour.*

Investigations

Investigations are not required in typical acne vulgaris. Secondary causes and suspected underlying disease or virilisation should be investigated

Management

1. Mild to moderate diseases

A. Topical agents

Mild disease is usually managed with topical over-the-counter (OTC) medications, such as gels, soaps, pads, creams and lotions that are applied to the skin. Creams and lotions are best for sensitive skin. Alcohol-based gels dry the skin and are better for oily skin.

Some topical agents are-

- **Benzoyl peroxide:** kills bacteria, accelerates the replacement of skin and slows the production of sebum
- **Retinoids** are a derivative of vitamin A. They unclog the pores and prevent whiteheads and blackheads from developing. Examples of topical retinoids prescribed are **Adapalene**, **Tazarotene** and **Tretinoin**
- **Salicylic acid:** assists the breakdown of blackheads and whiteheads and helps reduce inflammation and swelling
- **Sulfur:** exactly how this works is unknown
- **Azelaic acid:** strengthens cells that line the follicles, stops sebum eruptions and reduces bacterial growth. There is cream for acne, but other forms are used for rosacea
- **Resorcinol**: helps break down of blackheads and whiteheads

➢ It is advisable to start with the lowest strengths, as some preparations can cause skin irritation, redness or burning on first use

➢ These side effects normally subside after continued use. If not, see a doctor

B. Antibiotics

1) Topical- used in mild diseases and can be used in combination with other treatments. Commonly used topical antibiotics are-

✓ **Clindamycin** or **erythromycin**

2) Systemic- for moderate to severe acne

✓ **Oxytetracycline** (1.5 gm/day) or lymecycline for 3 – 6 months

✓ **Erythromycin** or **trimethoprim-** if above drugs fail or have little effect

- ✓ **Doxycycline** is another option but commonly causes **photosensitivity**
- ✓ **Minocycline** may be given with caution, as it causes hyperpigmentation, autoimmune hepatitis, drug induced lupus

C. Oral contraceptives

- Oestrogen containing oral contraceptives or oestrogen/ anti-androgen contraceptive may provide additional benefits in women

D. Isotretinoin

- If there is a failure to respond adequately to 6 months of therapy with these systemic and tropical approaches.

2. Moderate to severe diseases

- Isotretinoin has revolutionized the treatment of moderate to severe acne that has not responded adequately to other therapies.

Isotretinoin-

- ✓ This is a strong, oral retinoid, used for the treatment of severe cystic acne and severe acne that has not responded to other medications and treatments
- ✓ It is a strictly controlled medication with potentially serious side effects. Adverse effects include dry skin, dry lips, nosebleeds, fetal abnormalities if used during pregnancy and mood swings
- ✓ Patients who take isotretinoin must avoid vitamin A supplements, as these could lead to vitamin A toxicity
- ✓ It has a multifactorial mechanism of action, with reduction in sebum excretion (by over 90%), follicular hypercornification and *P. acnes* colonization
- ✓ A typical course lasts for 4 months

- Combination with systemic steroid may be required in the short term for severe acne, in order to minimize the risk of disease flare early in the treatment course

3. Physical measures and other treatment

- Intralesional injections of triamcinolone acetonide may be required for inflamed acne nodules or cysts
- Cysts and nodules can also be incised and drained or excised under local anaesthetics
- Keloid scars may respond to intralesional steroid and/or silicone dressings
- Pricking should be discouraged
- Carbon dioxide laser, microdermabrasion, chemical peeling or localized excision can also be considered for scarring
- UVB phototherapy or photodynamic therapy (PDT) can occasionally used
- Scarring can be prevented by treatment of active acne

- There is no convincing evidence to support a causal association between diet and acne
- The psychological impact of acne must not be underestimated

Prevention and management tips

Here are some tips for looking after skin that has acne or is prone to it:

- Wash face no more than twice each day with warm water and mild soap made especially for acne
- Do not scrub the skin or burst the pimples, as this may push the infection further down, causing more blocking, swelling and redness
- Avoid popping pimples, as this makes scarring likelier
- A specialist can treat a pimple that requires rapid removal for cosmetic reasons
- Refrain from touching the face
- Hold the telephone away from the face when talking, as it is likely to contain sebum and skin residue
- Wash hands frequently, especially before applying lotions, creams or makeup
- Clean spectacles regularly as they collect sebum and skin residue
- If acne is on the back, shoulders or chest, try wearing loose clothing to let the skin breathe. Avoid tight garments, such as headbands, caps and scarves, or wash them regularly if used
- Choose makeup for sensitive skin and avoid oil-based products. Remove makeup before sleeping
- Use an electric shaver or sharp safety razors when shaving. Soften the skin and beard with warm soapy water before applying shaving cream
- Keep hair clean, as it collects sebum and skin residue. Avoid greasy hair products, such as those containing cocoa butter
- Avoid excessive sun exposure, as it can cause the skin to produce more sebum. Several acne medications increase the risk of sunburn
- Avoid anxiety and stress, as it can increase production of cortisol and adrenaline, which exacerbate acne
- Try to keep cool and dry in hot and humid climates, to prevent sweating.

Rosacea

This chronic inflammatory condition affects the central face and consists of flushing, erythema, papules, pustules and telangiectasiae. The cause is unknown. It is distinct from acne vulgaris by- **sebum excretion is normal** and **comedones are absent.**

Clinical features

- Most commonly affects fair-skinned, middle-aged females and can be exacerbated by heat, sunlight and alcohol
- The convexities of nose, forehead, cheeks and chin are typically involved
- The condition is heterogeneous and in some, intermittent flushing, followed by fixed erythema and telangiectasiae predominate. In others, papules and pustules are prominent
- Sebaceous gland hyperplasia and soft tissue overgrowth of the nose (**rhinophyma**) can occur, particularly in males
- Conjunctivitis and blepharitis may also occur
- Facial lymphoedema can be an added complication

Investigations

- Usually no investigation is required
- The diagnosis is obvious clinically
- However, it must be distinguished from acne vulgaris, SLE, photosensitivity disorders and seborrhoeic dermatitis

Management

- Mild disease may respond to topical antimicrobials, such as **azelaic acid**
- **Tetracycline** or **erythromycin** for 3 – 6 months is usually effective in inflammatory pustular disease resistant to topical therapy
- Relapse may require intermittent or chronic antibiotic use
- **Systemic isotretinoin** may be helpful in severe resistant disease
- Erythema and telangiectasiae do not respond well to antibiotics but laser therapy can be effective
- **Rhinophyma** may need **laser therapy** or **surgery.**

TUBERCULOSIS SUSPECTED 34

Definition

TB presumptive case

Any person who presents with symptoms or signs suggestive of pulmonary TB, in particular

- Cough of long duration (>2 weeks)
- May also be coughing blood, have chest pain, shortness of breath, fever/night sweats, tiredness, loss of appetite and significant weight loss.

Clinical features of TB (symptoms and signs)

1. The highest priority for TB control is identification and successful treatment of patients who are suffering from smear-positive pulmonary TB. **Pulmonary TB** should be **presumed** in a person who presents with persistent cough for two weeks or more, with or without production of sputum despite the administration of a non-specific antibiotic. Often a patient with pulmonary TB has one or more of the following symptoms in addition to cough:
   - Respiratory symptoms: shortness of breath, chest pain, coughing up of blood
   - General symptoms: loss of weight, loss of appetite, fever, night sweats
2. Sputum microscopy should always be requested for a patient, who has cough for two weeks or longer, even in the absence of any other symptom. Signs and symptoms of **extra-pulmonary TB** depend on the site involved. Most common examples are:
   - TB lymphadenitis: swelling of lymph nodes
   - Pleural effusion: fever, chest pain, shortness of breath
   - TB arthritis: pain and swelling of joints
   - TB of the spine: radiological findings with or without loss of function
   - Meningitis: headache, fever, stiffness of neck and subsequent mental confusion
3. The diagnosis of extra-pulmonary TB should always be made by a graduate physician or specialist and often requires special examinations such as x-ray examinations, biopsies, FNAC, etc.

Tools for diagnosis of TB

- **Sputum smear examination**

  The most cost-effective tool for screening pulmonary presumptive TB cases is microscopy examination of their sputum by the Ziehl-Neelsen (ZN) method.

- **Radiological (x-ray) examination**

  Chest x-ray findings suggestive of pulmonary tuberculosis in patients with smear-negative microscopy should always be supported by clinical findings. A qualified physician should decide on the diagnosis of TB based on x-ray findings.

- **Molecular tests**

  Xpert MTB/RIF test is now available in Bangladesh. This test can confirm whether a patient has TB with or without Rifampicin resistance in two hours (Xpert MTB/RIF).

- **Culture of TB bacilli**

  Culture is more sensitive than smear microscopy, detecting a higher proportion of patients among presumptive TB cases. However, it takes about six weeks to provide a definite result and it is not accessible to most patients. Therefore, it is unsuitable as routine procedure.

- **FNAC and biopsy**

  These are special tests for confirmation of extra-pulmonary TB and should be performed by the concerned specialists.

Confirmed case

A) **Bacteriologically confirmed TB case** is one from whom a biological specimen is positive by smear microscopy, culture or WRD (WHO approved rapid diagnostic tool such as Xpert MTB/RIF).

B) **Clinically diagnosed TB case** is one who does not fulfill the criteria for bacteriological confirmation but has been diagnosed with active TB by a clinician or other graduate medical practitioner who has decided to give the patient a full course of TB treatment. This definition includes the cases diagnosed on the basis of x-ray abnormalities or suggestive histology and extra pulmonary cases without laboratory confirmation.

- All TB suspects should have two sputum samples examined by LED/ light microscopy. Early morning samples are more likely to contain the TB organism than a sample taken later in the day
- TB is declared as a ***notifiable disease*** in 2014 by the Government of Bangladesh. Any patient diagnosed as TB must be notified to *National TB Control Program*.

Table- 34.1 : Case definition by site and bacteriological status in adults	
Case classification	**Definition**
Pulmonary smear-positive TB (PTB+)	A patient with at least one sputum specimen positive for AFB, including any scanty smear result
Pulmonary smear-negative TB (PTB-) but positive on Xpert (MTB+/RIF)	(If Xpert is available) - A patient with symptoms suggestive of TB with two sputum specimens negative for AFB **and** - Found positive on Xpert MTB+/RIF- (MTB detected Rifampicin susceptible)
Pulmonary smear-negative (PTB-)	(If x-ray is available) - A patient with symptoms suggestive of TB with two sputum specimens negative for AFB **and** - Xpert MTB/RIF (if available) is ***Negative*** **and** - Chest x-ray abnormalities consistent with active TB **and** - Diagnosis is made by a qualified physician
Extra-pulmonary TB (EPTB)	A patient with TB of organs other than the lungs as confirmed by a qualified physician. eg- pleura, lymph nodes, abdomen, genitourinary tract, skin, bones and joints, meninges.

Table- 34.2 : Case definition by previous treatment history	
Case classification	**Definition**
New	- A patient who has never received anti-TB drugs **or** - A patient who has received anti-TB drugs for less than one month
Previously treated	- A patient who has received anti-TB drugs for one month or more than one month. These are sub-classified as relapse, treatment after failure, treatment after loss to follow up and other previously treated.
Relapse	- Relapse patients have previously been treated for TB, were declared cured or treatment completed at the end of their most recent course of treatment and are now diagnosed with a recurrent episode of TB (either a true relapse or a new episode of TB caused by reinfection).

Table- 34.2 : Continued	
Treatment after failure	- Treatment after failure patients are those who have previously been treated for TB and whose treatment failed at the end of their most recent course of treatment.
Treatment after loss to follow up/default	- Treatment after lost to follow-up patients, have previously been treated for TB and were declared loss to follow-up at the end of their most recent course of treatment (these were previously known as treatment after default patients).
Other previously treated	- Other previously treated patients are those who have previously been treated for TB but whose outcome after their most recent course of treatment is unknown or undocumented.
Transfer in	- A patient already registered for treatment in a DOTS center and who is subsequently transferred to another registration unit

Definitions of drug resistant tuberculosis (DR TB):

Drug resistant TB is confirmed through laboratory tests that demonstrate growth of infecting isolates of *Mycobacterium tuberculosis* in-vitro in the presence of one or more anti-tuberculosis drugs. By definition, there are four different categories of drug resistance

- **Mono-resistant TB:** resistance to one anti-TB drug
- **Poly-resistant TB:** resistance to more than one anti-TB drug, other than **Isoniazid** and **Rifampicin**
- **Multidrug-resistant TB (MDR TB):** resistance to at least **Isoniazid** and **Rifampicin**, the two most potent anti-TB agents. These drugs are used to treat all persons with TB disease
- **Extensively drug-resistant TB (XDR TB):** MDR TB, plus resistance to at least one of the **Fluoroquinolones** and at least one of three injectable second-line drugs **(Capreomycin, Kanamycin** and **Amikacin)**

Treatment

Aims of treatment

The aims of treating TB are:

- To cure the patient of TB
- To prevent death from active TB or its late effects
- To prevent relapse of TB
- To decrease transmission of TB to others
- To prevent the development of acquired drug resistance

Any TB patient identified as **drug resistant** should be **referred** to designated chest disease hospital for management (eg- Chittagong chest disease hospital).

Treatment regimen

Table- 34.3 : Standardized treatment regimen for each diagnostic category (for adults)

TB diagnostic category	Patient category	Treatment regimen	
		Intensive phase (daily)	Continuation phase (daily)
I	• New smear-positive patients • New smear-negative PTB • Extra pulmonary TB • Concomitant/ associated HIV/ AIDS	2(HRZE)	4(HR)
II	• Sputum smear-positive PTB with history of treatment of more than one month • Relapse • Treatment failure after cat-1 • Treatment after default • Others	2(HRZE)S/ 1(HRZE)	5(HR)E

Composition and dosages of FDC tablets:

- 4-FDC: Rifampicin 150 mg + Isoniazid 75 mg + Pyrazinamide 400 mg + Ethambutol 275 mg
- 2-FDC: Rifampicin 150 mg + Isoniazid 75 mg

Table- 34.4 : Dosages of FDC tablets for adults (category- I)

Pre-treatment weight (kg)	Intensive phase	Continuation phase
	Daily (first 2 months)	Daily (next 4 months)
	Number of 4FDC tablets	Number of 2 FDC tablets
30 – 37	2	2
38 – 54	3	3
55 – 70	4	4
>70	5	5

Table- 34.5 : Dosages of FDC tablets for adults (category- II)				
Pre-treatment weight (kg)	Intensive phase		Continuation phase	
	Daily (first 3 months)	Daily (first 2 months)	Daily (next 5 months)	
	Number of 4FDC tablets	Injection Streptomycin	Number of 2 FDC tablets	Ethambutol 400 mg (number of tablets)
30 – 37	2	500 mg	2	2
38 – 54	3	750 mg	3	3
55 – 70	4	1 gm*	4	4
>70	5	1 gm*	5	5
** The dose of Streptomycin should not exceed 750 mg daily after the age of 50 years.*				

*** All diagnosed TB patients should be treated under DOT. Directly Observed Treatment (DOT) is a very important component in the internationally recommended policy package for TB control (DOTS strategy).

DIPHTHERIA 35

Definition

Suspected case

Any person having

- Fever ≥38°C/ 100.4°F
- Sore throat/ hoarseness of voice and/or
- Exudative pharyngitis with or without pseudomembrane and/ or
- Swelling of neck/ axilla and/ or
- Nasal regurgitation during drinking

Probable case

In the absence of a more likely diagnosis, an upper respiratory tract illness with:

- An adherent membrane of the nose, pharynx, tonsils or larynx and
- Screening test positive but absence of laboratory confirmation and
- Lack of epidemiologic linkage to a laboratory-confirmed case of diphtheria

Confirmed case

An upper respiratory tract illness with an adherent membrane of the nose, pharynx, tonsils or larynx and any of the following:

- Isolation of Corynebacterium diphtheriae from the nose or throat or
- Histopathologic diagnosis of diphtheria or
- Epidemiologic linkage to a laboratory-confirmed case of diphtheria

◆ The infection is spread by droplets (coughing, sneezing, speaking) from the upper respiratory tract of a patient or carrier.

◆ The disease does not confer sufficient immunity.

◆ Immunization protects against the effects of the toxin but does not prevent individuals from becoming carriers.

Clinical features

1. Incubation period: 2 to 5 days
2. Signs related to the infection
   - Pseudomembranous tonsillitis (grey, tough and very sticky membranes) with dysphagia and cervical adenitis, at times progressing to massive swelling of the neck
   - Airway obstruction and possible suffocation when the infection extends to the nasal passages, the larynx, the trachea and the bronchi
   - Fever is generally low-grade

3. Generalized signs due to the toxin, they determine the prognosis
   - Cardiac dysfunction (gallop on auscultation, arrhythmias), myocarditis with severe heart failure at times leading to cardiogenic shock
   - Neuropathies: 1 to 3 months after the onset of the disease leading to difficulty in swallowing (paralysis of the soft palate), vision (ocular motor paralysis), breathing (paralysis of respiratory muscles) and ambulation (limb paralysis)
   - Oliguria, anuria and renal failure

Laboratory confirmation

Confirmation is made by culturing a toxigenic strain of C. diphtheriae from a throat swab.

Management of cases (in hospital)

- Careful examination of the throat
- Strict isolation of patients; contact and droplet precautions for medical staff (gloves, gown, masks and hand washing)
- Administration of diphtheria antitoxin derived from horse serum. Do not wait for bacteriological confirmation. Any delay can diminish efficacy. Administer according to the Besredka method to assess possibility of allergy.

- ◆ Risk of an anaphylactic reaction especially in patients with asthma
- ◆ Close monitoring of the patient is essential, with immediate availability of equipment for manual ventilation (ambu bag, face mask) and intubation, ringer lactate and epinephrine.
- ◆ Besredka method: inject 0.1 ml SC and wait for 15 minutes. If there is no allergic reaction (no erythema at the injection site or a flat erythema of less than 0.5 cm in diameter, inject a further 0.25 ml SC. If there is no reaction after 15 minutes, inject the rest of the product IM or IV depending on the volume to be administered.

- Doses are given as a function of the severity of illness and the delay in treatment

Table- 35.1 : Dosages and routes of administration of diphtheria antitoxin

Clinical signs	Dose in units	Administration route
Laryngitis or pharyngitis or duration < 48 hours	20,000 to 40,000	IM; or IV infusion in 250 ml of 0.9% sodium chloride in 2 to 4 hours for doses of more than 20,000 units
Rhinopharyngitis	40,000 to 60,000	
Severe form, cervical oedema or duration ≥ 48 hours	80,000 to 1,00,000	

<table>
<tr><th colspan="2">Table- 35.2 : Antibiotic treatment of diphtheria cases (for 14 days)</th></tr>
<tr><th colspan="2">If the patient can swallow</th></tr>
<tr><td>Azithromycin PO
• Children: 20 mg/kg once daily (max. 500 mg/day)
• Adults: 500 mg once daily
or</td><td rowspan="2">or
Phenoxymethylpenicillin (Penicillin V) PO
• Children under 1 year- 50 mg/kg/day in 4 divided doses (max. 500 mg/day)
• Children from 1 to 6 years- 500 mg/day in 4 divided doses
• Children over 6 years and adults- 1 gm/day in 4 divided doses</td></tr>
<tr><td>Erythromycin PO
• Children: 50 mg/kg/day in 2 divided doses (max. 2 gm/day)
• Adults: 2 gm/day in 2 divided doses</td></tr>
<tr><th colspan="2">If the patient cannot swallow</th></tr>
<tr><td colspan="2">Benzylpenicillin IM or slow IV (3 minutes)
• Children: 1,00,000 to 1,50,000 IU (60 to 90 mg)/kg/day in 4 divided doses [max. 4 MIU (2.4 gm)/day]
• Adults: 4 MIU (2.4 gm)/day in 4 divided doses</td></tr>
<tr><th colspan="2">In penicillin-allergic patients, use erythromycin IV</th></tr>
<tr><td colspan="2">Erythromycin IV infusion (60 minutes)
• Children: 50 mg/kg/day in 4 divided doses (max. 2 gm/day)
• Adults: 2 gm/day in 4 divided doses
Erythromycin powder (1 gm) should be reconstituted in 20 ml of water for injection only. Then, dilute each dose of erythromycin in 10 ml/kg of 0.9% sodium chloride in children less than 20 kg and in a bag of 250 ml of 0.9% sodium chloride in children over 20 kg and in adults. Do not dilute in glucose.</td></tr>
</table>

- As soon as the patient can drink, change to the oral route with one of the oral treatments above, to complete 14 days of treatment.
- Urgent intervention to secure an airway (intubation, tracheotomy) may be necessary in the event of laryngeal obstruction, cardiac or neurologic complications.

Management of close contacts

- Close contacts include family members living under the same roof and people who were directly exposed to nasopharyngeal secretions of the patient on a regular basis (eg- children in the same class, medical personnel)
- Throat culture; temperature and throat examination daily (7 days); exclusion from school or work until 48 hours of antibiotics have been completed

1. Antibiotic treatment
   a) Benzathine benzylpenicillin IM
      - ✓ Children under 30 kg (or under 10 years)- 6,00,000 IU as a single dose
      - ✓ Children 30 kg and over (or 10 years and over) and adults- 1.2 MIU as a single dose

   *** Benzathine benzylpenicillin should never be administered by IV route.

   b) In penicillin-allergic patients, use azithromycin or erythromycin PO as earlier, for 7 days
2. Verify vaccination status
   - Less than 3 injections: complete with pentavalent, DT or Td according to age
   - 3 injections: if the last injection was given more than one year before, give a booster dose
3. Medical personnel in direct contact with patients- one dose of Td (booster).

Prevention

- Once the patient has recovered update their immunizations
- As per routine EPI vaccination schedule, 3 doses of pentavalent vaccine is given at one month interval before the age of 1 year (at 6, 10 and 14 weeks of age)
- A booster dose one year later and DT (diphtheria 30 IU/tetanus) at 6 years of age followed by 3 more Td (diphtheria 3 IU/tetanus) boosters at 10 years interval should be given
- Mass vaccination (epidemic): update routine immunizations with pentavalent for children under 3 years of age; DT for children from 3 to 6 years of age; Td for children over 7 years of age and adults.

Health Communication

Health professionals need to communicate effectively as the majority of FDMN families entering Bangladesh do not have good English proficiency. Miscommunication is a barrier for providing adequate health care. Studies have documented that providing interpreter services ensures better healthcare access and health services utilization. Professional or volunteer interpreters may be used for effective therapeutic communication.

Tips for effective communication and using an interpreter:

- Do not use family, friends or untrained personnel as interpreters as confidentiality may be compromised
- Ensure that the interpreter and patient understand each others' language. It is vital to establish the specific language and dialect
- Ensure that the client is comfortable with the interpreter. In small communities or where there are potential political and ethnic divisions, confidentiality can be compromised
- When talking through an interpreter, address the client not the interpreter and speak in the first person. eg- do not use "…ask him how he feels…"
- Sit facing your patient, not the interpreter
- Speak in a natural tone of voice; it is a language difficulty not a hearing problem
- Avoid extended use of jargons
- Keep sentences short where possible, allow time for the interpreter to speak
- Provide regular summaries of the information presented to ensure comprehension
- Rephrase where there is poor understanding
- Refrain from extended conversations with the interpreter
- Reassure the patient of their rights to confidentiality
- The correct language and cultural sensitivities must be taken into consideration when booking an interpreter
- Try to understand patients' non-verbal communications and body languages
- Respect patients' culture, race and ethnicity.

Health Education

Health education plays a vital role to minimize disease related mortality and morbidity. It is regarded as the cost effective intervention to reduce hospital visit, hospital stay and healthcare expenditure. Reminding every patient about common health education messages and asking them to convey the messages to their families, friends and community.

Tips for common health education messages:

- Remind patients about washing hands before having meals and after using toilets
- Remind patients about drinking safe water and plenty in amount
- Remind patients about vaccination, if they have any child in vaccination age group
- Remind mothers for exclusive breastfeeding
- Remind families for family planning, antenatal visits and post natal care
- Remind to be physically active every day
- Remind to eat more whole grains and less added sugar
- Remind to eat five or more servings[1] of fruits and vegetables (combined) daily (if possible)
- Remind to eat foods low in saturated fat[2] and containing no trans fat[3]
- Remind families to use mosquito nets, if available.

1. A serving size for foods in the fruit or vegetable group equals a medium-size piece of fruit, a small glass of 100 percent fruit juice, 1 cup of raw salad greens, 1/2 cup of cut-up fruit or vegetables, 1/2 cup of cooked vegetables or beans or 1/4 cup of dried fruit. Many foods are typically eaten in portion sizes larger than one serving, so getting the recommended amount is easier.
2. Saturated fat mostly comes from animal sources such as meat and dairy foods and is solid at room temperature.
3. Trans fat is another type of unhealthy saturated fat. Most trans fat in the diet *comes from vegetable oils that have been chemically modified through a* process called hydrogenation to improve the shelf life of foods such as baked goods, snack foods and fast foods. eg- fried sandwiches and french fries. A much smaller amount comes from naturally occurring trans fat in certain types of meats. Trans fat is more heart unhealthy than saturated fat because it raises unhealthy LDL cholesterol and lowers protective HDL cholesterol).

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Regular EPI vaccination schedule for children (with vaccine type)								
Disease	**Vaccine type**	**Vaccine**	**Dose**	**Number of doses**	**Minimum interval between doses**	**Appropriate time of vaccination**	**Site of administration**	**Route of administration**
Tuberculosis	Live attenuated	BCG	0.05 ml	1	-	After birth	Upper part of the left arm	Intradermal (ID)
Diphtheria	Toxoid (inactivated toxin)	Pentavalent	0.5 ml	3	4 weeks	6 weeks 10 weeks 14 weeks	Outer aspect of the middle part of left thigh	Intramuscular (IM)
Pertussis	Subunit/ conjugate							
Tetanus	Toxoid (inactivated toxin)							
Hepatitis B	Subunit/ conjugate							
Haemophilus influenzae type b	Subunit/ conjugate							
Pneumococcal pneumonia	Subunit/ conjugate	PCV	0.5 ml	3	4 weeks	6 weeks 10 weeks 14 weeks	Outer aspect of the middle part of right thigh	Intramuscular (IM)
Poliomyelitis	Live attenuated	BOPV	2 drops	3	4 weeks	6 weeks 10 weeks 14 weeks	Oral	Oral
	Inactivated/ killed	IPV (fractional)	0.1 ml	2	8 weeks	6 weeks 14 weeks	Upper part of the right arm	Subcutaneous (SC)
Measles	Live attenuated	MR	0.5 ml	2	-	After completion of 9 months (1st dose) and 15 months (2nd dose)	Outer aspect of the middle part of right thigh	Subcutaneous (SC)
Rubella	Live attenuated							

***BCG-** Bacillus Calmette–Guérin; **PCV-** Pneumococcal Conjugate Vaccine; **BOPV-** Bivalent Oral Polio Vaccine; **IPV-** Inactivated Polio Vaccine; **MR-** Measles-Rubella (vaccine)*

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