



Government of Tripura

STANDARD TREATMENT PROTOCOL FOR MEDICAL OFFICERS



2014

Government of Tripura
Health & Family Welfare Department

Introduction

The Medical Officers at a Primary Health Centre is perhaps the only qualified modern medical practitioner that the people of Tripura have the access to consult in a rural area. The Medical Officers posted in those places have been trained in the setting of a Medical College with relatively higher availability of diagnostics as well as therapeutic facilities and to consult with the faculty and senior colleagues. In the primary health centre with little diagnostics and therapeutic facility as well as non availability of a senior to consult, it is very difficult for a Medical Officer to attain clinical decision making. This protocol is meant to help those professionals how to manage in such a situation and guide them in their daily clinical works utilizing the available resources.

The vast majority of diseases can be treated with the knowledge and skills that a qualified Medical Officer is trained for, but because of lack of continuing medical education programmes, lack of standard treatment guidelines, lack of diagnostic facilities and above all lack of self confidence, a Medical Officer often contents himself with symptomatic treatment and treatment of simple ailment and rest of the patients are referred to higher centres which could have been managed at PHC level.

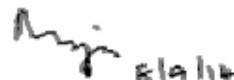
It has become an urgent need to prevent irrational and hazardous therapy. Unnecessary use of medicine are to be avoided because instead of improving the health it can cause hazard in addition to wastage of money. Rational health care also reduces costs for the public health system and makes the system more effective with the available financial resources.

To prepare the Protocol, the published guidelines of Standard Treatment Protocol of Govt. of Chhatisgarh and that of Govt. of West Bengal were taken as reference. This protocol is aimed to be used by the Medical Officers working in the Primary Health Centres with some additional guidelines for its use at the secondary level in the Community Health Centres.

Adoption of this Standard Treatment Guidelines is an important step towards the commitment of the government for providing health to every one at an affordable cost and with least hazard. This Protocol should not be considered as a set of Rules rather it should be considered as a guidelines.

This is the first attempt in this regard. Any mistake or incomplete information in the first may kindly be noted and suggestions for improvising are most welcome.

This has been prepared by several teams of doctors of Health department. I would like to thank each one of them for their assistance and contribution in making this possible.



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Secretary to Government of Tripura
Department of Health & Family Welfare

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Chapter I

SURGERY



1. DRESSINGS

Dressing is a set of procedures for treating a wound. A wound is an interruption in the continuity of the skin secondary to trauma or surgery.

Objectives

Protection

- To prevent contamination from the external environment.
- To protect against possible trauma

Cicatrization.

- To favour tissue regeneration

Absorption

- To absorb serous discharge

Disinfection

- To destroy pathogenic organisms.

Compression

- To stop hemorrhage

Warning : a dressing occludes a wound and in certain conditions (humidity, heat) and can encourage multiplication of pathogenic organisms.

Equipment

1 box of sterile instruments

- 1 dissecting forceps no teeth
- 1 Kocher forceps with teeth
- 1 pair of scissors

1 dressing tray (clean)

1 drum of sterile gauze pads

1 kidney dish

Cotton wool only to disinfect the tray (never use cotton wool directly on a wound).

Adhesive tape-

Flasks containing antiseptics: chlorhexidine, cetrimide, polyvidone iodine

Never use polyvidone iodine with soaps containing mercurial derivatives. Solution preparation must be rigorous. Solutions must be renewed every week.

General rules of asepsis

- Wash hands carefully after each dressing and after removal of soiled bandages and adhesive tape.
- A room should be kept for dressings. It should be carefully cleaned everyday and dressing tables should be disinfected between each patient.
- Use a sterile box of instruments for each dressing, or at least for each patient.
- Always start from the cleaner area and move to the dirtier one.

Techniques

Instrument preparation and cleaning of the dressing tray.

- Use a chlorhexidine-cetrimide solution

Removal of the previous dressing

- Removal of bandages and adhesive tape (not the gauze pads).
- Hand washing (clean water + soap).
- Removal of gauze pads, using Kocher forceps.
- If the dressing adheres, soak it with normal saline solution or an antiseptic.
- Act gently not to remove the granulating epidermis.

Wound examination

Sutured wound and/or aseptic wound

- Observe the stage of cicatrization, presence of weeping, appearance of an hematoma or of an infection.

Septic wound

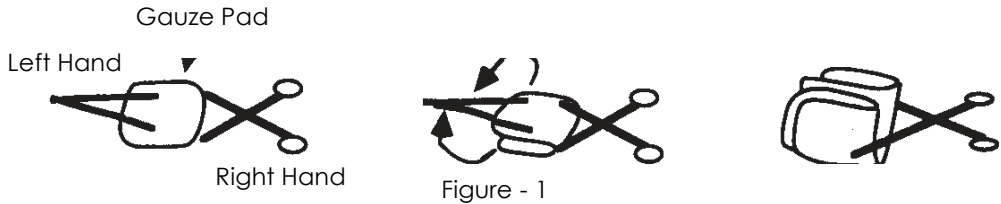
- Check the nature of secretions and if there are new fleshy pimples.
- A bluish pus indicates the presence of pyocianic (very resistant bacillus, spreading very quickly).
- Look for any signs of lymphangitis (reddish streaks).
- Use new Kocher forceps after removal of the dirty dressing and the first cleaning of the wound.

Cleaning of the wound

- Use the sterile dissection forceps to remove sterile gauze pads from the container and place them on the tray.
- To make a sterile sponge fold the pads twice using the Kocher

and dissection forceps (as illustrated) in figure-1.

- Pour an antiseptic solution on the pad
 Infected wound, burns, abscess, ulcers : chlorhexidine-cetrimide.
 On non-infected surgical wound, pour : polyvidone Iodine; on
 mycosis, eczema, impetigo, superficial burns.
 Small and superficial wounds : gentian violet.



- Clean the periphery of the wound either with a circular movement, or from top to bottom. Change gauze pads as often as necessary.
- Clean the wound from top to bottom with a new gauze pad.
- Dry the periphery of the wound and then the wound itself with different gauze pads.

Dressing a wound

- Apply one or several gauze pads to the wound.
- Apply strips of adhesive tape
 - Perpendicularly to the axis of the limb or the body
 - Leaving the central part free to avoid maceration.

Frequency of dressings

As a general rule (few exceptions) :

- Surgical wounds, or non-infected sutures :
 - First day dressing should be well protected.
 - Further dressings, every 48 to 72 hours. If the level of hygiene is poor. In the case of a clean wound, the less one touches it, the less it will become infected. Nevertheless the general state of the patient being also often poor, the process of recovery has to be observed regularly.
- Infected wounds
 - Dress every 24 hours.
- Deep or large burns

- Dress on the first day, then leave until the 7th day (unless obvious infection).

Associated antibiotic treatment

As a rule, systemic antibiotic treatment should not be prescribed routinely. Even topical antibiotics are optional.

But in some situations they are essential such as :

- Deep and soiled wounds, to prevent gas gangrene
Procaine benzylpenicillin
Child : 100000 I.M. /kg/ d x 5 days at least
Adult : 4 or 5 Mill / d once a day x 5 days at least. Or Amoxicillin (PO) : 1-2 gm/ d divided in 2-3 doses x 5 days If Amoxicillin is unavailable, give Ampicillin (PO) : 2-4 gm/ d divided in 2-3 doses x 5 days

- Abscess

Antibiotic treatment is useless before incision, but may be needed later.

- Burns

Only if they are infected.

- During conflicts; disaster relief conditions, or other situations where access to health care and patient's follow-up are unlikely :
The systematic use of amoxicillin should be considered.

Wastes

All soiled disposable materials (gauze, cotton, dressings...) should be collected and burned daily.

2. ABSCESS

This is a collection of pus in the soft tissues. An abscess cavity is not accessible to antibiotics. Treatment is thus surgical only.

Treatment

Incision and drainage should be performed once the abscess is "ripe" i.e. red and inflammatory swelling, painful, sometimes with fistula, fluctuant upon gentle palpation.

Material

- Sterile scalpel blade and handle.
- Surgical gloves.
- Plain curved forceps without teeth (Kelly forceps)(Sinus forceps).
- Sterile corrugated drain.
- Antiseptic solution e.g. Chlorhexidine-cetrimide solution.
- 5 or 10 ml. syringe.

Anesthesia

Local anesthesia of an abscess by infiltration with lidocaine is not effective. Furthermore, the needle may spread the infection further. If anesthesia is a must - general anesthesia is preferred Ketamine (IM), 10 mg/kg. For superficial abscesses, the skin can be briefly numbed using ethyl chloride spray.

Technique

Scalpel : the correct way to hold a scalpel is between the thumb and middle finger with the handle resting against the palm (see Figure-2.a). The forefinger must press the blade. It should not be held as one holds a pen or a dagger. The plane of the scalpel blade should be perpendicular to the plane of the skin.

Incision: the free hand immobilizes the wall of the abscess between thumb and forefinger. Incise in the long axis of the abscess with a single stroke to breach the skin. The incision should be long enough to allow insertion of an exploring finger. And on most dependent part.



Figure-2.a
Position of the hands for incision
of an abscess



Figure-2b
Exploration of the cavity with a
finger in order to break down
loculations



Figure-2c
Drain fixed to the skin

Figures2 : Technique for incision and drainage of an abscess

Precautions : take care not to incise too deeply if the abscess overlies major blood vessels (the carotid, axillary, humeral, femoral and popliteal regions). After breaching the skin, blunt dissect down to the cavity using Kelly forceps without teeth.

Explore : the cavity with the forefinger, breaking any loculating adhesions and evacuating the pus (see figure- 2 b). Abundant lavage of the cavity using a syringe filled with Chlorhexidine-cetrimide solution. Insert a drain, if possible fixing it with a single suture at the edge of the incision. The drain is withdrawn progressively then removed altogether after 3 to 5 days (see figure -2 c).

3 . BREAST ABSCESS

The management of breast abscess is slightly different. Usually the abscess is superficial but deep ones, when they occur, are more difficult to diagnose and to treat.

Treatment

Early in the infection, non-surgical measures should be applied

Antibiotics : Amoxicillin (PO) : 1-2 gm/ d divided in 2-3 doses x 5 days If Amoxicillin is unavailable, give Ampicillin (PO) : 2-4 gm/ d divided in 2-3 doses x 5 days or Chloramphenicol (PO) : 1-3 gm / d divided in 3 doses x 5 days.

Anti-inflammatory drugs : Ibuprofen 400 mg thrice daily.

Apply constricting bandage, stop breast-feeding from this side and expression of milk with a breast pump to avoid engorgement.

Where abscess is formed incision and drainage should be performed (see figure 3 a to 3 d) Material Same material as for other abscesses (see above).

Technique

Incision :

- for superficial abscess : radial incision.
- For abscess near nipple : peri-alveolar incision.
- For deep abscess : beneath the breast

Gentle exploration with finger or Kelly forceps.

Abundant lavage with chlorhexidine-cetrimide solution.

Insertion of a corrugated drain.



Figure-3a
Incisions : radial,
peri-areolar or
submammary



Figure-3b
Exploration (gentle)
with a finger or forceps



Figure-3c
Common sites for breast
abscess



Figure-3d
Submammary
incision

4 . PYOMYOSITIS

Infection and eventually abscess formation within muscle. At the beginning of infection, when the muscle is swollen, hot and painful, medical treatment may prevent abscess formation:

immobilize, anti. Inflammatory medication - Ibuprofen 400 mg thrice daily and

Antibiotics : Amoxicillin (PO):

Child : 50 mg/kg/d divided in 2-3 doses x 7 days; Adult : 2 gm/d in divided 2-3 doses x 7 days. If amoxicillin is unavailable, give Ampicillin (PO) : Child : 100 mg/kg/d divided in 2-3 doses x 7 days; Adult : 4 gm/d divided in 2-3 doses x 7 days).

Confirmation

Collection is not always easy to diagnose : conduct an exploratory puncture with a large-bore needle to confirm diagnosis which will reveal pus.

Material

The same, as for an abscess.

Anesthesia

Use Ketamine (1M) if needed .10 mg/kg.

Technique for abscess drainage

- Generous skin incision with a scalpel, avoiding underlying neurovascular tracts, and incision of the fascia and muscle sheath! (see figure 4 a)
- Blunt dissection with Kelly forceps (without teeth) or with scissors (mayo, curved) inserted closed, down to the abscess cavity and withdrawn slightly opened (see figure 4 b).
- Exploration with a finger to break adhesions and evacuate the pus (see figure 4 c)
- Abundant lavage with chlorhexidine-cetrimide solution.
- Where possible, counter-incision of the skin near the edge of the abscess, cutting down onto a finger that is inserted deep in the cavity. The counter-incision should be anatomically posterior to the abscess to allow gravity drainage (assuming the patient will

Figure-4
Technique for incision of muscle abscess



Figure-4a
Generous incision



Figure-4b
Blunt dissection of muscle using Kelly forceps : insert closed then withdrawn slightly opened



Figure-4c
Counter-incision for drain, cutting down onto a finger inserted deep in cavity



Figure-4d
Drain passing through the two incisions

be supine during recovery). A strip of corrugated drain is threaded through the two incisions (see figure 4-d), fixed with a suture to the edge of the incision and withdrawn around the 5th day.

Myositis of the right psoas muscle may present in a manner identical to that of acute appendicitis. Surgical evacuation is necessary.

5 . BURNS

Burns are very common, particularly among children who fall onto or roll into cooking fires. Any burn that affects greater than 10% of the body surface area is considered extensive and is thus serious and life-threatening because of fluid loss catabolism and the risk of secondary infection.

Assessing severity

Burns are classified according to depth and extent and each stage of evolution needs new evaluation.

“Rule of nines” for calculating percentage of body surface burned

Body area	Adult (%)	Child (%)
Entire head	9	18
Upper limb	9	9
Anterior or posterior surface of trunk	18	18
Lower limb	18	14
Perineum	1	1

The younger the child, the more severe the burn.

Depth of burns according to degree classification and clinical signs.

1st degree	Skin red and painful on palpation.
2nd degree	Skin red with blistering, painful on palpation.
2nd degree, deep	Skin white, dry and soft.
3rd degree	Black skin, indurated, insensitive.

Treatment

No severe signs

Clean with chlorhexidine-cetrimide (see table page 245).

Apply gentian violet.

Do not cover.

Shock following burns

- Calculate the fluid requirements for the first 24 hours :

Patient's body weight x % of surface burned x 2 = quantity of fluid required in ml. e.g. : patient 60 kg (body weight) x 20% (extent of burn) $60 \times 20 \times 2 = 2400$ ml or 2-4ml./ %/kg.

75% of fluid should be given through ringer lactate, the remainder as volume expanders or blood transfusion.

During the first 24 hours, half the fluid requirements should be given in the first 8 hours.

First dressing of the burn**Analgesia**

Pentazocine (IM)

Child > 3 years: 1 mg/kg/injection

Adult: 30 mg / injection and sedation if necessary:

Diazepam (IM)

Child: 0.3 mg/kg/injection

Adult: 10 mg/injection

Tetanus prophylaxis if available.

Strict aseptic technique : surgical towels, gloves and instruments all sterile (Figure 5).

Gently clean the burn with normal saline (NaCl 0.9% or ringer lactate)

or

Chlorhexidine-cetrimide solution.

Use a scalpel to debride blisters and non-viable tissue.

Apply sterile Vaseline gauze on burned areas then on top of that, two layers of non-sterile gauze pads. Do not use either antibiotic ointment or gauze impreg

nated with antibiotics or corticosteroids.

Apply a bandage, not tightly. Do not wrap limbs, especially at the flexures as this will encourage contractures. Bandage each finger separately, never together.

Immobilize limbs in the position of function.

Alternatively, "open method". After wound cleaning leave the burn covered only with the sterile Vaseline gauze or nothing. Patient is naked and protected by a fine mesh mosquito net.

Subsequent dressings

- Analgesia and aseptic technique as for the first dressing.
- Unless infection ensues (ill-smelling, pus), the first dressing should be left undisturbed for 5 to 7 days. The subsequent dressings should be done every 5 to 8 days.
- Remove any black eschars (which may hide purulent areas) and use scalpel to excise any necrotic tissue: skin, aponeurosis, muscle or even tendon.
- Systemic antibiotics if obvious infection (never use topical antibiotics):

Same dressing as the first time. Healing is signalled by granulation tissue: pink, mat and clear.



(Figure 5)

Dressing a burn : sterile technique, use of vaseline gauze.

PATCH GRAFTING

- Skin grafting is necessary for deep second degree and third degree burns, when the wound is slow to heal but is clean, and flat.
- Aseptic technique. Shave the area where patches will be taken (usually anterior thigh or forearm) and disinfect with povidone-iodine .Infiltrate with lidocaine 1%, subcutaneous.
- Lift up a patch of skin with fine forceps with teeth and excise it with a scalpel. It should be full-thickness i.e. epidermis plus dermis.

- Spread each patch out. Remove fat if necessary.
- Apply carefully to the wound.
- Do not place them too close together : further healing will bridge the gaps and this allows a larger area to be grafted.
- Dress with sterile Vaseline gauze, then layers of ordinary gauze pads.
- The graft will need 8 days to be successful. No further dressing before that time .Strict immobilization of the patient is required.
- Patch grafting can also be used for treating tropical ulcers once the base is clean and granulating.



(Figure 6)

Full-thickness patch skin graft :
sterile technique, taking patches using a fine forceps with teeth and a scalpel

6 . WOUNDS

Surgical indications –Precautions

This chapter concerns only wounds that can be treated at the primary health center level.

- Immediate suture of wounds is desirable but not always feasible and in some circumstances it may be dangerous.
 - Do not suture a wound later than 8 hours after the accident. Secondary suturing can be resorted after 8 hours in CHC.
 - Do not suture an infected wound.
 - Do not suture a war wound or due to animal bite.
- Any break in the skin overlying a fracture is an “open fracture”.
- A wound that communicates with a joint is an open joint wound.
- Always give tetanus prophylaxis if available (see tetanus).

Preparation

Wound toilet

Shave if necessary, then clean the wound and its periphery with povidone iodine.

Material

(Figures 7 a to 7 g and 8 a to 8 d)

- Sterile gloves and fenestrated surgical towels.
- Material for local anaesthesia.
- Suture set (sterilized box of instruments): needle holder, suture needles, scalpel blade and handle, one or two artery forceps, fine curved scissors with rounded ends, plain scissors for cutting sutures, retractors (), sutures, gauze pads.

Local anaesthesia

- Only necessary for large or deep wounds requiring more than 2 stitches.
- Lidocaine 1 % without adrenaline.
- Infiltrate subcutaneously via the wound edges.

Exploration

Have an assistant using retractors if necessary. Explore the wound and look for:

- Foreign body.
- Underlying fracture.
- Involvement of nerves, major blood vessels, tendons or joints.
- For scalp wounds : underlying fracture (if serious may contain brain tissue).

Closure

- Use interrupted sutures (not continuous).
- Non-absorbable sutures for skin, absorbable thread for subcutaneous tissues.
- Some suture material is already mounted on a needle, others have to be mounted.
- For skin use a "cutting" needle (triangular in cross-section).
- For subcutaneous tissues use a "round" needle (circular in cross-section).

Suture materials recommended for different wounds

Skin of face	Nylon (non-absorbable)	dec. 2.5 (=3/0*)
Skin of scalp	Nylon (non-absorbable)	dec. 3 (= 2/0)
Skin of limbs or trunk	Nylon (non-absorbable)	dec 2.5 or 3 (=3/0 or 2/0)
Subcutaneous tissue	Absorbable synthetic**	dec. 3 (= 2/0)
Aponeurosis	Absorbable synthetic	dec. 3 (= 2/0)
Muscle Tissue	Absorbable synthetic	dec. 3 (= 2/0)

* The more zeros there are, the finer the suture material is.

** Absorbable synthetic: resorbs slowly (over 3 weeks), e.g. vicryl@, Ercedex@, Dexon@, Ligadex@...

Technique

Schemes on the following pages show the main techniques for suture. (figures 8 to 16)

Drainage

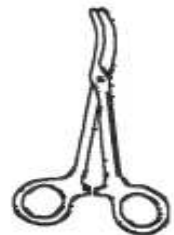
- Never use a drain for wounds of the face
- Always insert a drain in wounds of the scalp and whenever an hematoma can be expected or if the wound may weep.

Removal of sutures

- Face : day 5.
- Other wounds : day 7 or 8.

DIFFERENT INSTRUMENTS

(figure 7a)
Kocher forceps with
teeth



(figure 7b)
Kelly clamp curved,
no teeth



(figure 7c)

Mosquito forceps curved, no teeth
(also called clamp or hemostat)



(figure 7d)

Retractor (Faradeuf type)

HOW TO HOLD INSTRUMENTS



(figure 7e)

Always mount a scalpel blade using a needle holder.
Change blades for each different operation



(figure 7f)

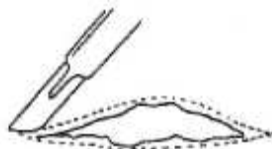
Dissecting forceps should not be held in the palm but between the thumb and index finger. Dissecting forceps with teeth should be used on skin only.



(figure 7g)

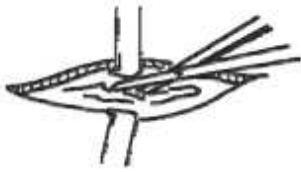
Insert the thumb and the ring into the handle of a needle holder (or scissors) and stabilise the instrument using the index finger.

DEBRIDEMENT



(figure 8a)

Debridement of a contused, messy wound : straightening of wound edges with a scalpel, Be very careful on the face.



(figure 8b) Excision of torn edges of aponeurosis to avoid necrosis

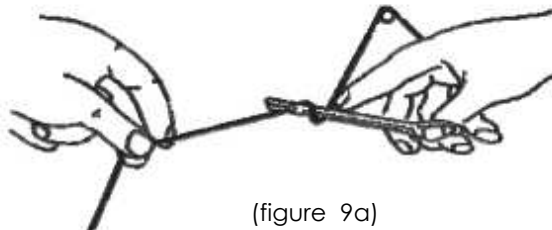


(figure 8c) Excision of torn or contused muscle

Figure 8 : Debridement

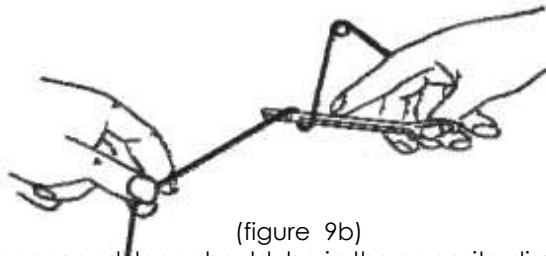
(this should be sparing, limited to excision of severely contused or lacerated tissue that is evidently destined for necrosis)

PRACTICE WITH KNOTS



(figure 9a)

Loop the suture material around the needle-holder in one direction (e.g. "over towards me") and remember this direction. Take the loose end with the needle holder and pull it through to make the first knot.



(figure 9b)

The second loop should be in the opposite direction ("under towards me"). Repeat a third knot, changing direction once again.

KNOTS



(figure 10a)
The first knot should be flat.



(figure 10b)
Second knot : opposite direction.



(figure 10c)



(figure 10d)

Catching the loose end with the needle-holder.



(figure 10a)



(figure 10b)

Slip the knot up towards the nail using the hand that holds the free end, holding the other length of suture with the needle-holder.

TYING KNOTS ON SKIN



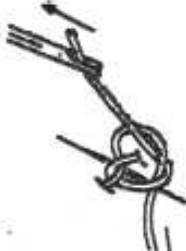
(figure 11a)
First knot flat.



(figure 11b)
Tighten without causing ischemia (pallor)

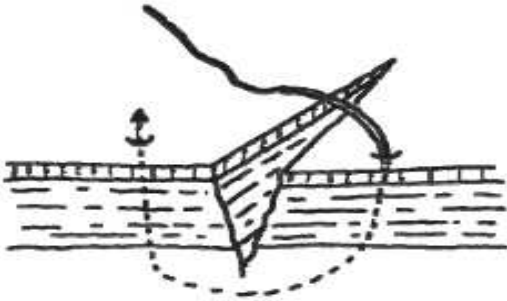


(figure 11c)
Loose end pulled through

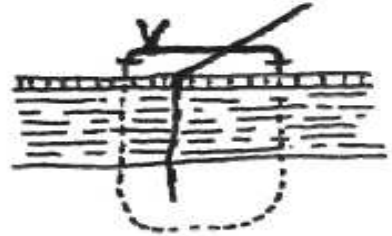


(figure 11d)
Second knot in opposite direction.

PARTICULAR PROBLEMS IN SUTURING



(figure 12a)



(figure 12b)

The "bite" taken must be sufficiently deep.

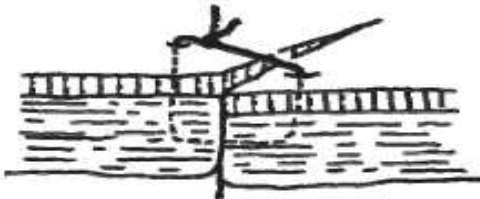


(figure 12c)



(figure 12d)

Incorrect : bite too shallow, so the edges invaginate.

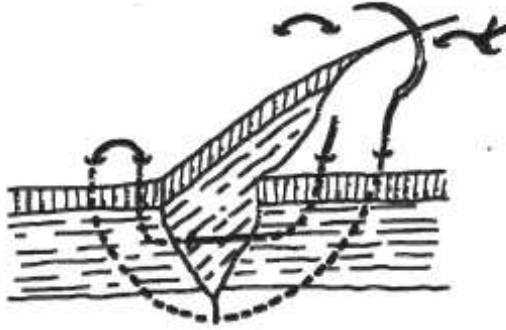


(figure 12e)

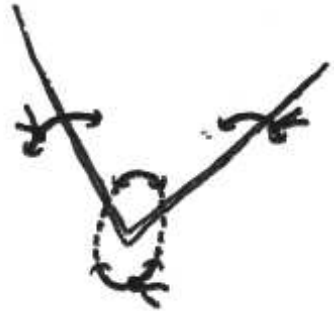


(figure 12f)

Incorrect : Poor opposition of the edges Incorrect : the knot should be beside the wound, not over it.



(figure 13)
Vertical mattress suture (also called Blair-Donati technique) :
allows good apposition of the wound edges.



(figure 14)
Closing a Corner



(figure 15)
Close skin using interrupted silk or nylon. In case of deep wound, a drain is usually advisable (emerging via a counter-incision to avoid hematoma



(figure 16)
Repair of muscle using interrupted sutures through the full thickness. Use chromic (or Vicryl) crossed in X.

7 . HEAD INJURY

Initial assessment is made by asking about

- Period of loss of consciousness
- Period of post traumatic amnesia
- Cause and circumstances of injury
- Presence of headache and vomiting.

The initial evaluation is made by looking for the following

- Signs of fracture
- Assessment of :
- Level of consciousness
- Neurological assessment
- Evidence of focal Neurological lesion
- Respiration
- Circulation- Blood Pressure, Pulse
- Associated injury to cervical spine, thorax, abdomen and other injuries.
- Haematoma on scalp and on face
- CSF leak from ear or nose

Treatment-at PHC

Maintenance of airway and breathing. Stabilize pulse and blood pressure. If required intravenous access should be established. Associated injuries to cervical spine, thorax, abdomen and other musculoskeletal injuries are taken care of.

REFER to District hospital/Surgical Centre

- Patient showing features of raised intra-cranial pressure in the form of bradycardia, dilated pupils, persistent headache or vomiting or any neurological deficit should be referred for further neuro-radiological assessment and management.
- Patient should be referred to neuro-surgical management if they have remained comatose (Glasgow coma scale 8 or less) or their level of consciousness has deteriorated.
- Also refer for other soft tissue injury or orthopaedic emergencies.

Before transferring the comatose patient ensure :

- Cardiovascular stability.

- Establish IV access.
 - Maintain airway and respiration.
 - Check for and stabilize extra-cranial injuries.
 - Ensure adequate monitoring, clinical notes, and equipment, to deal with complications in transit.
 - If spinal injuries are excluded then transfer the patient in lateral position with head down.
 - If spinal injuries suspected then transfer the patient on hard board.
 - Place two sand bags on either side of the head, in case of cervical spine injuries.
-

Due to the risk of intracranial haematoma associated with head injuries the patient even with minor head injury requires observation. Specially observe the patients with :

- History of loss of consciousness
 - History of vomiting
 - Scalp haematoma is present
 - When skull fracture is present
 - Patient with altered consciousness
 - Patient under the effect of alcohol
 - Black eye and bleeding or CSF discharge from ear and/or nose.
 - If spinal injury is suspected then transfer the patient on hard board
 - Place two sand bags on either side of the head in case of cervical spine injuries.
-

For the following topics some types of procedures performed are included. However the decision can be taken by the surgeon. The procedure of the surgery is not described here.

8 . THORACIC EMERGENCIES

8.1 PNEUMOTHORAX

Presence of air between the pleural layers. This may be associated with either serous fluid (Hydropneumothorax), pus (Pyopneumothorax) or blood (Haemopneumothorax) The emergency arises when it is associated with trauma

Clinical Features

- Evidence of fracture of ribs
- Air hunger

- Hyper-resonant percussion note with absent breath sounds over the affected side of the chest.

Investigation

- Chest X-ray shows absence of lung markings and a strip of collapsed lung medially.
- Trachea may be deviated to opposite side.

Treatment

Maintain airway and respiration. Simple aspiration with a wide bore needle to decompress the pleural cavity. If rapid re-accumulation occurs, introduce intercostal tube with under water seal drainage.

REFER

Should be referred to higher centre under water seal drainage

8.2 TENSION PNEUMOTHORAX

In lung injuries the air escapes into the pleural cavity and gets accumulated causing the collapse of lungs.

Clinical Features

- Decreased Air entry
- Increased percussion note
- Decreased breath sounds

Investigation

- Chest X-ray shows absence of lung markings and a strip of collapsed lung medially.
- Trachea may be deviated to opposite side.

Treatment guidelines

- Aspirate the pleural space of affected side with a wide bore needle and insert intercostal tube in an under water seal drainage bottle.

REFER

Refer the patient to higher centre with under water seal drainage bottle

9. LUMP IN BREAST

Commonly found lump in breast in young females is Fibro adenoma

9.1 FIBROADENOMA

Clinical Features

Solitary, firm, well defined, lobulated, extremely mobile, painless lump in the breast(mouse in breast)

Treatment

Drug treatment-none

Surgery is the choice of treatment. Excision of the fibroadenoma in CHC. The excised mass should be sent for histopathological examination.

9.2 MALIGNANCY

Common in older women.

Clinical Features

- Mass firm, ill defined, usually painless; not mobile. Suspect malignancy.
- Sometimes presents late when ulcerated or lymphnodes involved.

Treatment

REFER IMMEDIATELY to district hospital/tertericary care hospital

10. ACUTE ABDOMEN

All the cases of acute abdomen are to be referred to CHC, which has necessary surgical facilities. Details of management protocol are not included at present.

The common causes of acute abdomen are :

- Biliary colic

- Appendicular colic
- Renal or Ureteric colic
- Intestinal Colic - due to worm infection and intestinal obstruction un common but
- Acute pancreatitis
- Peritonitis
- Strangulation of gut
- Referred pain of male or female genital organs inflammation or torsion
- Vertebral retroperitoneal causes

Diagnosis

- Diagnosis is made on good history and through clinical examination.
 - X-ray may be needed in some cases.
-
- Do not give pain relieving injection or sedative to a patient of abdominal colic; if
 - Patient is being referred to specialist for consultation ;
 - Diagnosis of the abdominal pathology is not clear ;
 - There are features of acute intestinal obstruction and strangulation.
 - Do not give enema or purgative to a patient of
 - Peritonitis
 - Strangulated bowel
 - Acute appendicitis.
 - Abdominal massage is harmful and contraindicated in all abdominal colic.
 - In case of doubt : start IV infusion of Normal Saline, observe and examine the patient repeatedly without giving analgesic.
 - In case of increasing pain and progressive generalized and local features refer the patient to specialized centre for further management.
-

Of all conditions causing acute abdomen only acute appendicitis is discussed here.

10.1 APPENDICITIS

Salient diagnostic features

- Pain in abdomen, usually around the umbilicus which later shifts to the right iliac fossa
- Anorexia, nausea, vomiting

- Tachycardia, low grade fever may be present
- Localized tenderness and rigidity in the right iliac fossa
- Evidence of indirect pain in RIF by applying pressure at colon, extension at right hip or on per rectal examination.

Treatment

Treatment of acute appendicitis is appendicectomy, if the diagnosis is made at an early stage usually within 48 hrs.

The surgery is deferred if appendicular mass is formed.

11. ABDOMINAL TRAUMA

Any patient with distension of abdomen or shock after trauma, shift to higher centre with IV line.

11.1 LIVER TRAUMA

- Liver Trauma is uncommon due to position of liver. In all lower chest and upper abdominal stab wounds on right side, suspect liver injury.
- Haemorrhage leading to haemoperitoneum and shock may occur. Start IV line and fluids. Shift to higher centre.

11.2 SPLENIC TRAUMA

- Suspect rupture of spleen when there is direct injury to left upper quadrant of abdomen resulting in massive haemorrhage in to peritoneal cavity causing shock.

Start IV line and shift to higher centre.

12. HERNIA

Treatment

Treatment of choice is surgery, (elective) in CHC. Prior to elective surgery all factors contributory to raised intra abdominal pressure like cough, constipation, and difficulty in passing urine should be treated and controlled. Elective hernia surgery is a clean surgery, which may be herniotomy in children and herniorrhaphy or hernioplasty in an adult.

12.1 COMPLICATIONS OF HERNIA

Requiring emergency surgery are

- Obstruction and strangulation

Diagnostic features

- Irreducible Hernia which is tense and tender
- Abdominal pain and rigidity may appear
- There are associated features of intestinal obstruction and strangulation

Treatment

- Taxis (physical pressure to reduce) is unjustifiable

REFER

As emergency surgery is required; refer to appropriate surgical centre

13. HYDROCOELE

Diagnosis

- Unilateral or bilateral scrotal swelling. Possible to get above the swelling;
- Transillumination - positive

Treatment

Treatment of choice is surgery. May be done at CHC

14. PERIANAL ABSCESS

Acutely tender rounded swelling at anal verge.

Treatment

Drainage of the abscess. If not drained, it may form a fistulous tract resulting in fistula in ano. This may be done at PHC level also.

For permanent treatment refer the case to CHC for surgical excision of fistulous tract if formed.

15. FISSURE IN ANO

Diagnosis

Clinical Features

- Constipation
- Sharp agonizing pain during defecation
- Bright streaks of blood in stools
- Ulcer at the lower end of the anal canal seen when tightly closed puckered anus is stretched apart.

Drug treatment

Lignocaine jelly or ointment (5%) applied locally 3-4 times a day; And Tab. Metronidazole (400 mg) for 5 days, twice a day. And Tab Ibuprofen (400 mg) one tablet 8 hourly And Sitz bath (Warm water with potassium permanganate 1:10000 or Povidone iodine) twice a day And Isapghula husk 1-2 teaspoon in water one or two times a day for control of constipation and straining during defecation Or Liquid paraffin (5-15 ml) at bed time for one month, if no relief with local Lignocaine application

Surgical Treatment

Aim of therapy is to cause complete relaxation of the anal sphincter that will relieve pain and slowly heal the fissure. Anal dilation under general anaesthesia; Fissurectomy & sphincterotomy if needed.

16. PILES (HAEMORRHOIDS)

Haemorrhoids are swollen but normally present blood vessels, in and around the anus and lower rectum, that stretch under pressure, similar to varicose veins in the legs. The increased pressure and swelling may result from straining to move the bowel. Other contributing factors include pregnancy, heredity, aging, and chronic constipation or diarrhoea. Haemorrhoids are either inside the anus (internal) or under the skin around the anus (external). Haemorrhoids usually are not dangerous or life threatening. In most cases, haemorrhoidal symptoms will go away within a few days.

Diagnosis

- Many anorectal problems, including fissures, fistulae, abscesses, or irritation and itching (pruritis ani), have similar symptoms and are incorrectly referred to as haemorrhoids. Diagnosis rest on clinical features and, rectal examination.

- Although many people have haemorrhoids, not all experience symptoms. The most common symptom of internal haemorrhoids is bright red blood covering the stool or in the toilet bowl.

However, an internal haemorrhoid may protrude through the anus outside the body, becoming irritated and painful. This is known as a protruding haemorrhoid. Symptoms of external haemorrhoids may include painful swelling or a hard lump around the anus that results when a blood clot forms. This condition is known as a thrombosed external haemorrhoid.

- In addition, excessive straining, rubbing or cleaning around the anus may cause irritation with bleeding and/or itching, which may produce a vicious cycle of symptoms. Draining mucus may also cause itching.
- Examination of the anus, per digital examination of the anal canal and viewing the anal canal and rectum through a proctoscope helps define the extent of the lesion and differentiate from other anal conditions. If other causes of bleeding suspected, then sigmoidoscopy also needed.

Treatment

Medical treatment

Medical treatment of hemorrhoids initially is aimed at relieving symptoms. Warm tub or Sitz baths several times a day in plain, warm water for about 10 minutes. Ice packs to help reduce swelling. Application of a haemorrhoidal cream for suppository to the affected area for a limited time. (many such creams available e.g. Anovate, Faktu or Proctosedyl ointments)

Surgical Treatment

In some cases, hemorrhoids must be treated surgically. These methods are used to shrink and destroy the hemorrhoidal tissue and are performed under anaesthesia. A number of surgical methods may be used to remove or reduce the size of internal hemorrhoids. These techniques include:

Anal stretching - the anal sphincter is stretched under General Anaesthesia.
Rubber band ligation - A rubber band is placed around the base of the hemorrhoid inside the rectum. The band cuts off circulation, and the hemorrhoid withers away within a few days.

Sclerotherapy - A chemical solution is injected around the blood vessel to shrink the hemorrhoid.

Techniques used to treat both internal and external hemorrhoids include; Electrical or laser heat (laser coagulation) or infrared light (infrared photo coagulation) Both techniques use special devices to burn hemorrhoidal tissue. Haemorrhoidectomy - Occasionally, extensive or severe internal or external hemorrhoids may require removal by surgery known as hemorrhoidectomy. This is the best method for permanent removal of hemorrhoids.

Prevention of hemorrhoids and the recurrence of hemorrhoids Prevention of the recurrence of hemorrhoids is aimed at changing conditions associated with the pressure and straining of constipation. Increasing fiber and fluids in the diet. Eating the right amount of fiber and drinking six to eight glasses of fluid (not alcohol) result in softer, bulkier stools. A softer stool makes emptying the bowels easier and lessens the pressure on hemorrhoids caused by straining. Good sources of fiber are fruits, vegetables and whole grains.

Eliminating straining also helps to prevent the hemorrhoids from protruding.

17. LEG ULCERS

Also known as tropical ulcer or rice picker ulcer. Found commonly in village communities who suffer repeated trauma to their legs during their daily work at fields or rain forest. Repeatedly trauma and infection leads to chronicity.

Definition

Full thickness necrotizing bacterial infection of the skin of lower limb preceded by stage of cellulitis.

Common sites

On leg below knee, Commonly lower third of leg just above malleoli, Skin of dorsum of foot.

Clinical feature

The disease progresses in following sequence. The clinical picture will depend on stage of patient's presentation to hospital. There is often a history of thorn prick or laceration.

Clinical features depend on stage :

- Bacterial Cellulitis
- Necrosis
- Line of demarcation and Slough separation
- Redness, Oedema and fever
- Foul Smelling discharge.
- Infection with dead skin, black in the colour.
- Same + Fever
- Ulcer with foul smell discharge with foul yellow Or grey-green pus adherent to granulation tissue

Treatment

Early diagnosis and prompt treatment is needed.

Supportive Treatment

Bed rest
Elevation of Limb
Frequent dressing

Drug Treatment

Early cellulitis with papules. Procaine Penicillin—Inj 6 lacs IU 12 Hourly After sensitivity test for 4-5 days. Metronidazole 400 mg TID x 4-5 days.

If infection does not improve refer to higher centre.

In Necrosis with slough formation

Surgical removal of slough and gangrenous tissue. Local dressing with polyvidone iodine or chlorhexidine. Avoid moisture. Extensive Ulcer may require a qualified surgeon for skin grafting.

18. VARICOSE VEINS

Varicose veins is the most common vein disorder. They are large, twisted veins, usually in the legs and feet, that are not transporting blood effectively. They appear as bulging, bluish cords beneath the surface of the skin. If ignored, varicose veins can cause not only discomfort and cosmetic concerns, but also problems such as phlebitis (inflammation of the veins, skin ulcers, and blood clots). Varicose veins develop when veins stretch and their valves, which

prevent back flow of blood, fail. It affects women, obese and those who stand for long periods – more than others.

Clinical Features

- Prominent dark-blue blood vessels, especially in the legs and feet (not “spidery” looking veins)
- Aching, tender, heavy, or sore legs
- Swelling in the ankles or feet, especially after standing

Treatment

Prevention

Regular exercise improves vein functioning, and weight loss and exercise decreases the likelihood of blood clots. Avoid prolonged sitting, standing, or walking, getting regular exercise, elevate legs on a periodic basis, and wear compression stockings. At night, keep legs raised on a pillow, (above the level of the heart). Surgery. Surgical and other Procedures can be tried if the veins are cosmetically unacceptable to the patient or if there is frequent bleeding and ulceration.

Referral for

Sclerotherapy - injection of a solution into a varicose vein, followed by application of a compression dressing, in order to obliterate the veins-or surgery for removal of the varicose vein can be done. At a centre that is undertaking such work.

TRAUMA & INJURY

Types of Injury:-

- Blunt or Non Penetrating
- Penetrating
 - Ø Low - Velocity
 - Ø High - Velocity (Missile Injury)

Injuries caused by road Traffic Accident (RTA) :-

- Head & Cervical Spine Injuries.
- Cervical whiplash & Sternal Injuries.
- Sternal fractures and Dorsal Spine Injury.

- Fracture of lower Ribs and rupture spleen and liver.
- Intra-abdominal and Diaphragmatic Injury.
- Pelvic Fracture and urinary Tract Injuries.
- Lower limb fracture associated with either dislocation of the hip or Spinal fractures.

Seat belt Injuries:-

- These injuries are secondary to restraint caused by seat belt. Small intestinal and mesenteric damage, intra-abdominal vessels may be traumatized.
- Disaster caused by earthquake, typhoons, flood, etc. may come to the emergency. It is, therefore important to set priorities not only in the management of individual but also in the organization of care of the totality of the injured group.

Clinical features:-

Patients should be thoroughly examined for injuries in-

- Head.
- Face.
- Neck.
- Thorax.
- Abdomen.
- Pelvis.
- Spinal Injuries : Test for peripheral sensory and motor defects.

- X-ray spine should be undertaken.

Bladder should be evacuated by a urethral catheter.

Transfer to tertiary Hospital

- Gunshot wounds of Abdomen – Should be explored by laparotomy. So all gunshot wounds should be transferred to a tertiary hospital.
- Renal Injury – Is treated conservatively if the patient is stable with in 24-48hrs.
- Bladder and urethral Injury – Treated by supra-pubic cystostomy. Patient may be shifted to the secondary or tertiary level Hospital.
- Gunshot wound of the chest: - It is important to put air tight seal drainage.
- Blast Injuries: - Ear drums. Lungs & heart & GI tract are the most vulnerable organs affected by blast injuries.
- If the level of consciousness is deteriorating and pupils are changing in appearance, better to transfer the patient to tertiary level.

TRAUMA MANAGEMENT:-Ø *Non-pharmacological :-*

1. Providing an adequate airway by two fingers "sweep", is used to clear solid materials from mouth and pharynx combined with suction to remove fluid & debris.
2. Protecting the cervical spine by the use of balloon, sand bag, Fore head strapping.
3. Ensuring adequate ventilation & oxygenation.
4. Covering and sealing open "sucking" chest wounds.
5. Controlling external bleeding by direct pressure.
6. Monitoring of the neurological status.
7. In case of obvious fracture of an extremity with gross deformity, the limbs should be gently drawn into alignment and a POP cast should be applied.
8. A nasogastric tube should be inserted in patients with abdominal wounds. Emergency laparotomy should be undertaken without delay in a specialized hospital or patient is referred to secondary and tertiary hospital.
9. In case of urethral injury no attempt should be undertaken for catheterization. A suprapubic cystostomy with a Foley catheter should be done. X-Ray pelvis should always be done before transfer the patient to tertiary Hospital.
10. Rapid estimation of brain and spinal cord is necessary by Glasgow come scale.

Glasgow coma scale (GCS):-

The GCS is scored between 3 and 15, 3 being the worst and 15 the best. It is composed of 3 parameters: - Eye-opening

Verbal Response

Motor Response

Note that the phrase GCS of 11 is meaningless and it is important to break the figure down into its components as E3 V4 M4 = GSC 11. A score of 13 and higher indicates mild brain injury, 9-12 is a moderate injury and 8 or less is a severe brain injury.

A score of 12 or less should be referred to tertiary hospital with CT scan facilities.

Trauma Patient may be divided into four categories:-

1. Critical: - Within seconds. e.g. - Acute laryngo tracheal obstruction.
2. Immediate: - Within minutes, e.g. - Tension pneumothorax.
3. Urgent: - With in golden "Hour" e.g. - Major burn or multiple organ Injury.

Pharmacological management :- The following drugs may be used :

- Inj Diclofenac
- Inj Cefotxime
- Inj Ranitidine

Indications of Referral:-

1. A penetrating injury to the chest, abdomen, head, neck or groin.
2. Two or more proximal leg bone fracture.
3. Burn > 15% of BSA combined with facial Injuries or air-way problem.
4. A flail chest.
5. Evidence of high energy impact - missile Injury.

ABDOMINAL INJURY

Abdominal Injury may be of

- Penetrating Injury & Stab Injury
- Blunt Injury.

PENETRATING / STAB INJURY:-

- Assessment of vital signs regarding hemodynamic stability is important.

Treatment guidelines:-

- o Packing the wound with pressure bandage/ stitching & dressing.
- o Clean air way plus moist O₂.
- o Start IV fluid with RL.
- o Pain killer – Diclofenac Sodium/ Tramadol Hydrochloride.
- o Proton pumps inhibitor/ H₂ blocker, Pantoprazole/ Rabeprazole/ Aciloc etc..
- o Nasogastric suction.
- o Tetanus Toxoid.
- o Antibiotic. Amoxicillin / Cefalaxin (500mg) / Ceftraxone (1mg) / Ceforoxins (1mg)/
- o Catheterization.

- Refer the patient to a higher center with well equipped surgical facility.
- Institutions with surgical facility: Exploratory laparotomy and repair of the defect.

BLUNT TRAUMA:-

Thorough examination of Abdomen to exclude spleen/ Liver/Kidney/ Intra abdominal injury along with examination of other system is important.

Treatment guidelines:-

- Quick assessment of the patient and simultaneous management is needed.
- Clean air way with moist O₂.
- Start IV fluid RL.
- NO SEDATION.
- Nasogastric suction.
- Pain killer – Diclofenac Sodium/ Tramadol Hydrochloride.
- Proton pumps inhibitor/ H₂ blocker.
- Tetanus Toxoid.
- Catheterization.
- Antibiotics IV.
- Frequent checkup of vital signs to detect any deterioration.

Refer to Higher Surgical center after primary management if there is sign of:-

- Haemoperitonium.
- Gut perforation.
- Visceral injury.
- Other associated grave injury.
- Unstable hemodynamic condition.
- Condition not manageable at the centre.

Institutions with surgical facility: Exploratory laparotomy and repair of perforation or injuries.

SOFT TISSUE INFECTIONS

Types & Features:

A. Abscess: Cardinal feature of acute inflammation e.g. rubor (redness), calor (heat), dolor (pain) & tumor (swelling) and actio laesa (loss of function).

Treatment: -

- Antibiotic. Ceftriaxone / Cefroxione / Amoxicillin
- Analgesic. Ibroprofen 400mg / 200mg, Diclofenic Sodium 50mg
- l & d.
- Proton pumps inhibitor/ H2 blocker. Pentrapazole 40 mg / Aciloc 150 mg

B. Cold abscess: Neck, back & spine are the common sites.

Diagnosis:

Tender or slightly tender/o low grade fever, leucopenia, lymphocytosis.

Treatment:

Swab to be send for AFB and c/s- ATT to be started.

C. Cellulitis and Lymphangitis: This is a non supportive invasive infection of tissue.Lymphangitis presents as painful red streaks.

Signs- Chills, fever, rigor.

Treatment: Rest of the part, with elevation of limb.

- Antibiotic.
- Analgesic.
- Diabetes to be ruled out.

D. Boil (syn.furuncle): It is an acute Staphylococcal infection of a hair follicle with peri folliculitis which may results into suppuration and central necrosis. C/f- Painful indurated swelling appears with gradual extension.

Treatment: Improvement of general condition.

- Appropriate antibiotic.
- Analgesic. Tab. Brufen 400 mg
- Drainage of pus.

E. Carbuncle: Infective gangrene of the subcutaneous tissue due to Staphylococcal infection. Association with Diabetes. Central large slough surrounded by smaller areas of necrosis.

Treatment: Antibiotic. Inj. Ceftriaxone 1gm
Analgesic. Inj. Declofenac Sodium 50 mg
Wound debridement and dressing.

SHOCK IN SURGICAL CASES

Shock is a condition, where there is poor tissue perfusion with impaired cellular metabolism, manifested by serious pathophysiological abnormalities.

The common causes of shock are:-

Hypovolumic, Septic, Neurogenic, Cardiogenic, anaphylactic and psychogenic.

Treatment:-

- Arrest of haemorrhage.
- Replenishment of intravascular & extra cellular fluid Volume. Start I.V line with normal saline rapidly with a wide bore I.V. cannula. Cross matched whole blood; where there is blood loss, to maintain intravascular volume in the absence of readily available blood, use colloids, Dextran, plasma, human albumin.
- Start O₂ inhalation with a flow at least 2 lit / min.
- Adequate sedation/Analgesia.
- Tetanus prophylaxis in case of any ext injury
- I.V H₂ Blocker / PPI
- Broad spectrum antibiotics.
- Naso gastric drainage
- Catheterization.
- Close monitoring of the vitals.

Shock due to injury to any internal organs and major burn injury should be referred to a higher center after primary resuscitation.

Institutions with surgical facility : Requirement of Surgery will be based on removal of primary offending cause of shock.

ACUTE ABDOMEN

Thorough history and examination including vital sign followed by quick investigative modalities is very helpful in this case.

Investigations: Radiology- X-ray supine, erect, lat Decubitus.
Ultrasonography of abdomen.
Routine laboratory investigations.

MANAGEMENT:-

Non-pharmacological:-

- Watch respirations, temperature & pulse.
- I.V drip to correct hypovolaemia, urine output
- Ryle's Tube suction

Pharmacological:-

- Analgesics – Inj Pentazocin / Inj Declofenac (Inj Diclofenac to be avoided in case of peptic ulcer)
- I.V antibiotics (I.V metrogyl to be added to cover antibiotics).
- Enema to be avoided in case of acute abdomen.
- In case of obstructed inguinal hernia foot end to be elevated.

Indications for Referral:-

- Strangulated inguinal hernia
- Peptic perforation
- Acute cholecystitis refractory to conservative treatment.
- Blunt trauma abdomen, not responding to conservative treatment.
- Acute appendicitis, acute pancreatitis.
- Intestinal obstruction.

ACUTE APPENDICITIS / BURST APPENDICITIS

Acute appendicitis is still a common surgical emergency.

- A detailed history, along thorough clinical examination, followed by a brief investigation is sufficient to diagnose a case of acute appendicitis.

Treatment:-

- In case of acute appendicitis, appendisectomy to be performed under GA/SA, if present within 48 hrs of attack.
- By the third day of an acute attack, a lump may be felt in the right iliac fossa.
- Treatment will be conservative for lump.
- I.V fluid.
- Antibiotics I.V for the first 3 days following by oral antibiotics.
- Interval appendisectomy to be done after 8-10 weeks at a secondary level Hospital.

Criteria for stopping conservative Treatment:-

- o A rising pulse rate.
- o Vomiting a copious gastric aspirate.
- o A spreading abdominal pain.
- o Increased size of abscess.

Transfer the patient to secondary level hospital for surgery.

Institution with surgical facility: Appendisectomy to be done for fresh cases of appendicitis.

ACUTE CHOLECYSTITIS

Acute inflammation of gall bladder is presents as pain in the right upper quadrant of abdomen with vomiting and fever.

Investigation: USG of abdomen is the investigation of choice.

Treatment: IVF 5% Dextrose, DNS, R/L
Antispasmodic analgesics. Inj. Diclofenac Sodium 50 mg
Antibiotic Cefroxin / Ceftriaxone / Cefalaxin
Nasogastric aspiration

Patient may be referred to secondary hospital for cholecystectomy.

ACUTE PERITONITIS

Localized and generalized acute inflammation of peritoneum that may be bacterial or sterile.

MANAGEMENT:-

Non – pharmacological:-

- Blood count & erect or lat decubitus x-ray of abdomen can diagnose most cases. USG whole abdomen where available can give important clue.
- Diagnostic paracentesis & examination for pus cells and bacteria, blood, pancreatic fluid, bile etc. may help in certain patients.
- Nasogastric suction & continuous drainage.
- IVF – NS, DNS, RL, plasma vol expanders & Blood transfusion as per require

ments.

- Indwelling Foleys catheter with continuous monitoring of urinary output
- Moist O2 inhalation.
- Breathing exercise, leg exercise & postural changes.

Pharmacological:-

- Broad spectrum parental antibiotic
- Analgesics: Inj tramadol/Inj pentazocine. NSAIDS to be avoided if perforation is suspected.
- Sedation. Inj. Pentazacin 50 mgm / Inj. Pethidin 100mgm
- Inotropic agents like Dopamine/Dobutamine
- Ranitidine/Pantoprazole

Indication for Referral:-

Most patients require referral to the secondary or tertiary hospital with ongoing supportive conservative treatment. Moreover life threatening complications like endotoxic shock or multi organ failure require intensive therapy unit at tertiary level hospital.

HERNIA

A thorough history & complete clinical examination is very important in a case of hernia, mainly to identify obstructed/strangulated hernia which is a surgical emergency.

Management:-

- Non obstructed hernia – patient can be prepared for the operation – Herniotomy, Harniorrhaphy, Harnioplasty at the Hospitals where arrangement for anaesthesia are available.
- Obstructed Hernia – can be treated at the primary level by I.V fluid, antibiotics, nasogastric suction & sedation. Foot end of the bed may be raised. However, if obstruction is not relieved after 24-48hrs of conservative treatment or there is sign of impending strangulation, the patients should be transferred to the secondary or tertiary level hospital for the further management (mainly operative).

Institution with surgical facility :

Hernioplasty or herniotomy to be done as per age or requirement.

PAIN ABDOMEN

Renal/Ureteric Pain:-

- In severe pain, inj Diclofenac along with inj Ranitidine. Switch over to tab Diclofenac, when severe pain subsides.
- Plain X-ray KUB region followed by referral to a specialist centre should be done subsequently.

Ureteric / prostate & vesical pain:-

- Drink Plenty of water
- Inj Diclofenac followed by tab diclofenac
- Sample for RE/ME & culture sensitivity test to be done where facilities exists.
- Appropriate antibiotics.

Note:-

- On receipt of c/s report, change antibiotic accordingly
- In children, Ampicillin is preferred
- Plain x-ray KUB, USG KUB & Cystoscopy where facilities exists to exclude calculus.

Surgical intervention: The surgical intervention to be selected as per cause and site of the cause.

URINARY RETENTION

A. *Non-pharmacological :-*

- Patients presenting with primary retention should be catheterized with an Foleys catheter, slow decompression is done if the retention is chronic.

B. *Pharmacological :-*

These are often associated with urinary sepsis hence the patients may be started with:

- Norfloxacin 400mg twice a day
- Ciprofloxacin 500 twice a day

Indications for referral: -

All patients with retention are referred to higher center for further investigations & treatment.

TORSION OF TESTIS

Salient features:

- Young age.
- Testis tender, lies higher, scrotal oedema.
- Not possible to feel the testis and epididymis separately.
- Confusion with diagnosis of epididymo-orchitis- in that case elevation of testis, relieves the pain.
- It is a surgical emergency.

Treatment guidelines:-

- Primary care by rest, scrotal support, analgesics, manual derotation.
- Failure to respond within hours needs consideration for operative management, preferably after Doppler examination of testis for viability.

Institution with surgical facility: Immediate exploration and correction of torsion is to be done. If the testis is not viable orchidectomy may be required .

PARAPHIMOSIS

- When tight foreskin is retracted forcibly to expose the glans-penis and then cannot be retracted to its normal position a paraphimosis results-leading to the obstruction of venous and lymphatic flow of the glans and foreskin with an alarming swelling of these structures.

Management: Apply ice bags to reduce congestion.

Apply Lignocaine jelly over the oedematous constricting ring and gently squeeze the swollen prepuce for a few minutes. By this maneuver, oedema subsides following which gently pull the prepuce back to its normal position while keeping pressure over the tip of glans penis with both or either thumb. Multiple rapid puncture with needle aseptically of the swollen prepuce with continuous pressure and thrusting of glans sometime helps. If the above maneuver fails, then slit the dorsal prepucial skin (the constricting band) using 1% Lignocaine as the local anaesthetic. Circumcision when oedema subsides.

Chapter II

MEDICINE



ACUTE BRONCHIAL ASTHMA

DEFINITION : An airway disease characterized by chronic inflammation, Hyperresponsiveness, with exposure to wide variety of a stimuli, and Obstruction with variable air flow limitation.

Symptoms : paroxysm of cough, dyspnoea, chest tightness & wheezing.
It's a chronic disease with episodic acute exacerbations that are interspersed With symptom free period.

Evaluation regarding,

- [a] how long & how bad attacks
- [b] previous medications
- [c] tachycardia, tachypnoea, wheezing
- [d] use of accessory muscles of respiration,

intercostals, suprasternal, subcostal indrawing [e]cyanosis, clubbing, pulsus para-doxus > 10mm & silent chest.

FEV1 / PEFr :

FEV1 – 0.6 lit. in healthy or <2.1 lit. post Tx or 400ml increase post Tx
Initial PEFr <16% of predicted [aprox. 70 lit/min, >30% good.

Blood gas : Hypoxemia, hypercarbia, uncomplicated BA – hypocarbia, mild respiratory alkalosis.

Normal PCO₂ in BA is a sign of impending respiratory failure.

All BA Patients are hypoxemic – treated with supplementary O₂ in high Concentration by face mask to achieve O₂ saturation >90%.

INHALATION THERAPY:-

Inhaled Short acting beta2 adrenergic agonist{SABA} either by Spacer or Nebuliser.

ALBUTEROL/SALBUTAMOL 2.5 µg every 20min. for 3 doses by Nebulization[NZ] or 4 to 8 puffs every 20min. for upto 4hrs by metered dose inhaler[MDI] with spacer. Alternatively 10 to 15 µg can be administered by continuous NZ over 1hr.

O₂ inhalation to maintain Sao₂>92%, in pregnancy >95%

Iv access – dehydration correction.NS,1/3N/S,2/3D5W.

IPRATROPIUM BROMIDE – 500mcg NZ, every 20min for 3doses or 8puffs by MDI With spacer edery 20min as needed for upto 3hrs.

CORTICOSTEROIDS :- IV Methylprednisolone[MP] 60-125mg or Prednisone 40-60mg Orally, or 4mg/kg MP iv followed by eight day tapering dose or MP 4MG/KG OR 125MG iv 6hrly for 3days, alternative include Dexamethasone 6-10mg iv or Hydrocortisone(4mg/kg) 150-200mg. In case no iv access steroid can be given im or orally.

AMINOPHYLLIN[AMP]– Who failed to respond to SABA :

NOTE – PREVIOUS THEOPHYLLIN USE/ ESTIMATION OF LEVEL.

Empirical loading dose – 5.6mg AMP/kg of ideal body wt., in obese 5mg/kg or a bit less. Previous theophyllin use- 2.5mg loading, then continuous infusion 0.3mg/kg/1hr in elderly,debilitated,CCF,comatose pt., healthy pt. 0.5mg/kg/1hr, smoker 0.8mg/kg/1hr, Children 1mg/kg/1hr. Iv salbutamol 0.5mg in 3ml of NS, Terbutaline 0.25mg sc every 20 min for 3doses or Adrenaline/Epinephrine 0.2- 0.5ml in 1:1000 solution sc. In vascular collapse Adrenaline iv 5-10ml of 1:10000. Salbutamol alternative dose 10microgm/kg over 10min stat, followed by iv infusion 0.2microgm/kg/min increased by 0.1mcg/kg/min or ETtube 0.25ml of Salbutamol respirator solution in 3ml of NS. Magnesium sulfate to be given iv 2gm over 20min in severe exacerbations. Antibiotics if infection. Heliox(helium+O₂) may improve ventilation & decrease work of breathing with acute severe airflow obstruction ; be careful not to lower patients O₂ saturation; controversial treatment. Heliox may be given alone or can be used to NZ Albuterol.

Last resort Halothane inhalational anaesthesia – caution for myocardial depression & Arrhythmia.

Endotracheal intubation & Ventilation : Decision to intubate during the first few minutes of a severe asthma attack is clinical. Slowing of the respiratory rate, depressed mental status, inability to maintain respiratory effort, or hypoxemia during a severe asthma exacerbation suggests the patient require intubation. In the absence of anticipated intubation difficulty, rapid sequence intubation is preferred. Nasal intubation is not recommended.

Measurement of severity is based on peak exp. flow rate[PEFR]
PEFR <40% predicted[or 200L/min in most adults] indicate severe obstruction. In severe distress pt. may not be able to perform test. CXR & ABG necessary. Hypercapnia does not occur unless a PEFR <25% of normal[100-150L/min]

Assessment of exacerbation

Initial- FEV₁ or PEF \geq 40% mild to moderate, <40% severe, repeat after R/
40-69% moderate, <40% severe exacerbations.

RESPONSE : FEV1 or PEF \geq 70% Good, 40-69% Incomplete, $<$ 40% Poor.

ACUTE CORONARY SYNDROME

Acute coronary syndrome is a term that encompasses both unstable angina and MI. ACS may present as a new phenomenon or against a background of chronic stable angina.

SYMPTOMS :

- 1) Prolonged severe crushing substernal chest pain sometimes described as squeezing or constricting sensation with radiation to left arm, throat, epigastrium or back.
- 2) Anxiety and fear of impending death.
- 3) Nausea and vomiting.
- 4) Breathlessness.
- 5) Collapse / Syncope.

PHYSICAL SIGNS:

- 1) Signs of sympathetic activation – Pallor, Sweating, tachycardia.
- 2) Signs of vagal activation – vomiting, Bradycardia.
- 3) Signs of impaired myocardial function
Hypotension, oliguria, cold extremities.
Narrow pulse pressure.
Raised JVP.
Quiet S1, and presence of S3.
Diffuse apical impulse.
Lung crépitations.
- 4) Signs of tissue damage – fever.
- 5) Signs of complication – MR, Pericarditis.

DIAGNOSIS –

Diagnosis is made by history, clinical examination, ECG findings and Trop T test, CK-MB

TREATMENT :

- (1) Absolute Bed Rest. Admit in CCU..
- (2) Moist O2 inhalation by nasal canula, nasal prongs or face mask 2-4 Lt/min for first 6-12 hours after infarction.
- (3) Sedation – IV morphine sulphate 5-10mg and antiemetics (metoclopramide 10mg)

- (4) Anti thrombotic therapy (Antiplatelet therapy)
 - Tab Aspirin 300mg orally stat.
 - Tab clopidogrel 300mg, followed by 75mg daily thereafter.
 - Glycoprotein II b/ III a Inhibitor – Tirofiban and abciximab are given in pts who undergo PCI or high risk patients having recurrent ishchaemia.
- (5) Anticoagulants :
 - Low molecular weight heparin –
 - Enoxaparin 1mg/kg 12 hourly S/C
 - Pentasaccharides –
 - Fondaparinux 2.5mg S/C OD
- (6) Anti Anginal therapy :
 - Sublingual Glyceryl trinitrate (300-500mg)
 - IV Nitrate (GTN 0.6-1.2 mg / hour or Isosorbide dinitrate 1-2 mg/hour)
 - IV B.Blockers eg:Atenolol 5-10mg or metoprolol 5-15mg given over 5 mins) if there is no cardiac failure, hypotension, heart block or Asthma.
- (7) Reperfusion therapy :-
 - a. Non ST Segment elevation ACS – (NSTEMI) Thrombolytic therapy has no demonstrable benefit.
 - b. ST segment elevation ACS (STEMI)
 - Primary PCI is the treatment of choice if facility is available.
 - Thrombolysis :
 - Alteplase – A bolus dose of 15mg, then 50mg over 30 mins & then 35 mg over 60 mins.
 - Retepase (rPA) – given as 10mg I/V bolus & repeat 10mg I/V bolus after 30 mins.
 - Streptokinase – 1.5 million units over 60 mins

Acute kidney injury

Introduction:

Acute kidney injury (AKI) is characterized by sudden impairment of kidney function resulting in the retention of nitrogenous and other waste products normally cleared by the kidney. Major medical complication in developing country, most often encountered with diarrheal illness, infectious disease, like malaria, leptospirosis.

Epidemiology: AKI complicates 5-7% of hospital admission, 30% of admission in ICU. AKI is associated with significant in hospital morbidity and mortality .mortality is 30-60% depending on the clinical setting and presence or absence of non-renal organ system failure. Mortality is high as 50% especially in ICU set up. Four

fold increase in incidence in US since 1988, higher than the incidence of stroke.

Definition: More recently, the AKI network has suggested a definition which depends only on a greater than 0.3 mg/dl rise or a >50% increase in serum creatinine or Development of oliguria where urine output <0.5 ml/kg/h for greater than 6 h.

Causes of AKI are divided into 3 categories

Pre-renal causes (55%): Intravascular volume depletion: Hemorrhage, Vomiting, diarrhea, overzealous Diuretics therapy. Reduced Cardiac output: Cardiogenic shock, CHF, tamponade, huge pulmonary embolism. Systemic vasodilatation: Sepsis, Anaphylaxis, Antihypertensive drugs. Renal vasoconstriction: Hepatorenal syndrome

Renal causes (40%) : Glomerulonephritis, Acute interstitial nephritis, Acute tubular necrosis due to prolonged hypoperfusion or due to Toxins: i.Exogenous toxins like Radiocontrast, Cyclosporine, Aminoglycoside, Cisplatin, Acetaminophane or ii. Endogenous toxins Rhabdomyolysis, Hemolysis, Uric acid, Calcium
Infection: pyelonephritis
Renovascular obstruction

Post-renal cause (5%): Urethral obstruction: prostate, urethral stricture, Bladder calculi or neoplasms, Pelvic or retroperitoneal neoplasm, Bilateral ureteral obstruction (neoplasm, calculi), Retroperitoneal fibrosis.

Clinical assessment

Symptoms of pre-renal AKI include thirst and orthostatic dizziness. Physical signs are orthostatic hypotension, Tachycardia, Reduced jugular venous pressure, Decreased skin turgor and dry mucous membrane suggests pre-renal azotemia. Stigmata of chronic liver disease with portal hypertension feature suggestive of advanced cardiac failure, Sepsis or other causes of reduced effective arterial blood volume. Recent initiation of treatment with NSAIDs, ACE inhibitor, or ARB. Hypovolemia, septic shock, and major surgery are important risk factor for ischemic ATN. AKI persists despite normalization of systemic hemodynamics increase risk of ischemic ATN.

Nephrotoxic ATN – recent exposure to nephrotoxic medication, radiocontrast agent, or endogenous toxins.

Allergic interstitial nephritis: clinically characterized by Fever, Pruritic erythematous rash, eosinophilia is seen in less than 1/3 of patients of AIN, following exposure to a new drug. Pyuria, WBC cast and eosinophilluria are also sug

gestive of AIN.

Clinical presence of Flank pain suggests Occlusion of renal artery or vein, Parenchymal disease like glomerulonephritis, pyelonephritis.

AKI associated with Oliguria, Edema, Hypertension and active urinary sediment suggests nephritic syndrome.

Postrenal ARF may present with suprapubic and flank pain .Colicky flank pain suggests ureteric obstruction.Prostatic disease suggested by nocturia, frequency, and hesitancy and enlargement of prostate

AKI-Signs and Symptoms: Weight gain, Periorbital edema, Peripheral edema. Hypertension commonly seen in parenchymal disease mainly glomerulonephritis .There may be signs of complications like Hyperkalemia , Nausea/Vomiting, Pulmonary edema, Ascites , Asterixis , Encephalopathy

Acute Kidney Injury Diagnostic Tools

Urinary Sediment: Acellular and transparent hyaline cast: Hyaline cast are formed in concentrated urine from normal constituents of urine – particularly Tamm horsfall protein. Seen in Pre-renal azotaemia , Urinary outlet obstruction. RBC casts or dysmorphic RBCs: Acute glomerulonephritis , Small vessel vasculitis. WBC Cells and WBC Cast: Acute interstitial nephritis, acute pyelonephritis . Renal Tubular Epithelial (RTE) cells, RTE cell casts, pigmented granular (“muddy brown”) casts: Acute tubular necrosis

Other investigation: TC, DC, Hb%: suggestion of infection, sepsis. Anemia can be seen a few cases of AKI. Blood urea, creatinine should be monitored daily. Serum Electrolyte to detect and early treatment of hyperkeleemia and hyponetremia .Serum Calcium, Phosphorus, uric acid. Urine culture, Blood culture X-ray chest, ECG. Renal biopsy is needed only for histological diagnosis of glomerulonephritis.

Management

General measure: Good nursing care, Regular oral toilet, Consistent documentation fluid intake and output, daily Body weight measurement.

Diet: sodium and potassium restriction are appropriate Protein restriction 0.60 – 0.75 gm/kg/day.

Pre-renal azotemia: prevention and treatment requires optimization of renal perfusion. Severe acute blood losses are treated with blood transfusion. Less severe acute hemorrhage treated with isotonic crystalloid and/or colloid should be used. Plasma loss in burn and acute pancreatitisare treated with isotonic

crystalloid and/or colloid should be used. Severe hypovolemia: isotonic crystalloid. Less severe hypovolemia: hypotonic crystalloid are used.

Cirrhosis and hepatorenal syndrome: terlipressin, octreotide, Combination therapy with octreotide a somatostatin analogue, Midodrine an α 1 adrenergic agonist, norepinephrin definite therapy is liver transplantation

Other drugs: ANP, Low dose Dopamine, Endothelin antagonist, Loop diuretics, CCB, Prostaglandin analogue, IGF all has been tried and have been failed to show benefit in the treatment of acute ischemic acute tubular injury.

Postrenal AKI: prompt recognition and relief of urinary tract obstruction.

Volume management: Fluid and sodium should be restricted to 3-4gm/day. Fluid balance by total output+ 500ml. Increase urine output by diuretics, but that usually does not alter the course of renal injury. Furosemide bolus 200mg followed by an IV drip (10-40 mg/h), with or without Thiazide diuretic. Should be stopped if no response. Low dose dopamine may increase salt and water excretion in prerenal states, but no benefit in ischemic AKI.

Electrolyte and acid base balance: Acidosis treated with IV or oral sodium bicarbonate. If PH is <7.2 and serum bicarbonate $<15\text{mmol/L}$. Hyperphosphatemia treated with phosphate binder like calcium acetate, calcium carbonate, savelamer, aluminium hydroxide gel. Hyperkalemia treated by I.V sodium bicarbonate, I.V calcium, insulin in glucose I.V, sodium polystyrene sulphionate, dialysis if not responding to medical treatment.

Indications of Dialysis: When medical management fails to control volume overload, Symptoms of uremia, Pericarditis, uremic gastritis, encephalopathy. Hyperkalemia not responding to medical treatment, pulmonary edema, severe acidosis.

When to initiate dialysis: many prefers to initiate before the onset of life threatening complication. Many nephrologist initiate dialysis empirically when BUN exceeds 100mg/dl.

ACUTE LEFT VENTRICULAR FAILURE

Acute LVF presents with a sudden onset of dyspnoea at rest that rapidly progresses to acute respiratory distress, orthopnoea and prostration.

The patient appears agitated, pale and clammy. The peripheries are cool. Tachy Cardia, Hypertension or Hypotension, Raised JVP. Gallop rhythm, cardiac murmur, Basal crepts are present in Acute LVF.

TREATMENT :

- 1) Sit the patient up in order to reduce pulmonary congestion.
- 2) Give oxygen (high flow, high concentration through face mask).
- 3) Administer nitrates – IV Glyceryl trinitrate 10-200 mcg/min, titrated upwards every 10 mins until clinical improvement occurs or systolic BP falls to <110 mm Hg.
- 4) Administer a loop diuretic such as furosemide 40-100 mg I/V stat, may be repeated after 2 to 3 hours. Maintenance dose 40 mg I/V 12 hourly till there is clinical improvement.
- 5) IV opiates may be cautiously used when patients are in extremis.
- 6) If these measures prove ineffective, inotropic agents (Dopamine or Dobutamine) may be required to augment cardiac output particularly in hypotensive patients.
- 7) Insertion of intra- aortic balloon pump can be very beneficial in patients with acute cardiogenic pulmonary edema especially when secondary to myocardial infarction.
- 8) Appropriate Antibiotics in case of infection.

Bacterial Meningitis

Bacterial Meningitis is a serious infection of the CSF. It is most commonly caused by one of three types of bacteria. Haemophilus influenza type b, Neisseria meningitidis and Streptococcus pneumonia. Meningitis caused by streptococcus pneumonia called pneumococcal meningitis. The bacteria are spread by direct close contact with the discharges from the nose or throat of an infected person. Common symptoms are high fever, headache and stiff neck. Other symptoms can include nausea, vomiting, photophobia, confusion, drowsiness and seizure. Advanced bacterial meningitis can lead to brain damage, coma and death. Survivors can suffer long term complication, including hearing loss, mental retardation, paralysis and seizure.

Treatment guideline:-

Antibiotic and supportive care in the form of airways, nutrition, fluid and electrolyte balance, and treatment and prevention of shock is the main stay of the treatment of Bacterial Meningitis.

H. Influenza	Ceftriaxone 1-2gm I.v. x 12H	7–14 days	Prevention of Seizure, Patency of airways & parenteral nutrition, fluid & Electrolyte balance management etc. And conservative management of Symptoms.
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Pneumococcal M.I.C.1 micro gm/ml	Ceftriaxone 2gm I.v. x 12H Vancomycin 15mg/k.g. x12H Dexamethasone 10mg. I v.stat & I.v. x 6 H for 4 days.	10 -14 days	do
M.I.C. .0.5 micro gram/ml	Ceftriaxone 2gm I.v. x 12H Or Cefotaxime 2gm I.v.x6H	10 – 14 days	do
M.I.C. 0.1micro gm / ml.	Ceftriaxone 2gm I.v. x 12H Or Cefotaxime 2gm I.v.x6H	10 – 14days	do
N Meningitidis	Penicillin- G 4million I.v. x4H Or Ceftriaxone 2gm I.v. x 12H	7 -14 days	do
S.aureus maningitis	Ceftriaxone 2gm I.v. x 12H Or Cefotaxime 2gm I.v.x6H Or Penicillin- G 4million I.v. x4H	10 -14 days	do
Listeria monocytogenes maningitis	Oxacillin & nafcillin 2gm I.v. x4 H		
Gram-negative bacillary meningitis including Pseudomonas aeruginosa	Ampicillin 2gm I.v. x 4 H in combilation with aminoglycoside.	21 -28 days	do
Note M.I.C.			
Minimum inhibitory concentration.	Ceftazidime or Cefepime, 2gm I.v. 8H. High dose ceftriaxone or Cefotaxime. Alternative meropenem & ciprofloxin may be used . Please note that penicillin allergy	10 -14 days	L.P. mandatory. C.S.F. Culture & specific causative organism detection carry gold standard for managment.

Patient alternative antibiotic may be opted to meropenem 1gm I.v. x 8 H and Chloromycetin 75 - 100mg /kg. x6H & vancomycin 15mg/kg. I.v. x12 H		
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Chronic Kidney Disease

Introduction

- Chronic kidney disease is a spectrum of different pathophysiological process associated with abnormal kidney function ,and a progressive decline in glomerular filtration rate (GFR)
- The definition of CKD requires that at least 3 months of renal failure have occurred.
- The term chronic renal failure applies to the process of continuing significant irreversible reduction in nephron number, and typically corresponds to CKD stages to 3-5.
- Stages of CKD : In order to stage CKD, it is necessary to estimate GFR by equation. Most applicable equations are MDRD equation and Cockcroft – Gault equation.
- Stage 1: Slightly diminished function; kidney damage with normal or relatively high GFR (≥ 90 mL/min/1.73 m²).
- Stage 2: Mild reduction in GFR (60–89 mL/min/1.73 m²) with kidney damage.
- Stage 3: Moderate reduction in GFR (30–59 mL/min/1.73 m²)
- Stage 4: Severe reduction in GFR (15–29 mL/min/1.73 m²)
- Stage 5: Established kidney failure (GFR < 15 mL/min/1.73 m², end stage renal disease (ESRD))

Common Causes of CKD

- a. Diabetes mellitus
- b. Hypertension
- c. Glomerulonephritis
- d. Polycystic Kidney Disease
- e. Renal deposition diseases, e.g: amyloidosis
- f. Renal Vascular Disease - renal artery stenosis, atherosclerotic
- g. Episodes of ARF (usually acute tubular necrosis) often lead, eventually, to CKD

Clinical features

Sodium and water homeostasis: In most patient of stable CKD the total body content of sodium and water is modestly increased. Dietary sodium intake exceeds its urinary excretion, leading to sodium retention and extra-cellular fluid volume expansion. Can lead to hypertension and can accelerate nephron damage. Pedal Edema , anasarca and Hypertension (poorly responsive to therapy) In addition to problem with salt and water excretion, some patients with CKD may also have impaired renal conservation of sodium and water. G.I fluid loss , overzealous diuretic therapy may cause ECFV depletion, can lead to further deterioration of renal failure on pre-renal basis.

Potassium homeostasis: Hyperkalemia may be precipitated by Increased dietary potassium intake, Protein catabolism, Hemolysis , Hemorrhage, Transfusion of blood, Metabolic acidosis Drugs like potassium sparing diuretic, ACEi, ARBs. CKD can occasionally be associated with hypokalemia as a result of, markedly reduced dietary intake, Excessive diuretic therapy, G.I loss due to nausea and vomiting, primary salt wasting nephropathy- fanconi syndrome, renal tubular acidosis, Hereditary and acquired tubulointerstitial disease.

Metabolic acidosis: Common in advanced CKD. It is due to less ammonia production, Hyperkalemia induced depression of ammonia production. Metabolic acidosis can manifest as chest pain, palpitations, headache, and altered mental status. Deep, rapid breathing called Kussmaul respirations. Extreme acidemia may lead to Neurological abnormalities like lethargy, stupor, coma, seizures. Cardiac abnormalities: arrhythmias, decreased response to epinephrine , both can lead to hypotension.

Anemia: A normocytic normochromic anemia is seen as early as stage 3 and is universal at stage 4. It is due to insufficient erythropoitin production. Iron deficiency due to blood loss in CKD patient .Acute and chronic inflammation with impaired iron utilization. Severe hyperparathyroidism with consequent bone marrow fibrosis and Shortened RBC life span. Less common causes are: Alluminium toxicity, Uremia induced bone marrow depression, Dialysis blood loss, G.I blood loss.

Endocrine Abnormalities: Azotemic pseudodiabetes. Insulin: Prolonged half-life due to reduced clearance by kidney may cause decrease insulin requirement in diabetic with CKD. Amenorrhea and pregnancy failure: low estrogen levels. 20% pregnancies leading to live birth. Impotence, oligospermia and loss of libidodue to low testosterone levels.

Dermatologic Abnormalities: Pallor due to anemia, Skin color changes due t

accumulation of pigmented metabolite or urochrome, Ecchymoses and hematomas due to clotting abnormalities, Pruritus and Excoriations due to Ca deposits from secondary hyperparathyroidism.

Gastrointestinal Abnormalities: Peptic Ulcer disease, gastritis, mucosal ulceration can cause abdominal pain, nausea, vomiting, G.I. bleeding. Constipation, worsened by calcium, iron supplements. Uremic Fodor: bad breath due to ammonia. Non-Specific abnormalities: hiccough.

Neuromuscular Abnormalities: CNS Abnormalities: Mild-Moderate: Sleep disorders, impaired concentration and memory, irritability. Severe: Asterixis, myoclonus, stupor, seizures and coma. Peripheral neuropathies: "Restless legs" syndrome – abnormal ill-defined sensation. Sometime debilitating discomfort. Relieved by frequent leg movement. Sensory neuropathy is more than motor neuropathy, Distal more than proximal, Lower limb more than upper limb.

Epidemiology of CVD in CKD: Cardiovascular disease is the leading cause of morbidity and mortality in CKD. 40-50% of deaths in dialysis patient due to cardiovascular problem. 40-75% of pts starting dialysis already have CVD. CVD mortality in dialysis pts is 10-20 times higher than in general population.

Cardiomyopathy-LVH: Concentric LVH is associated with pressure overload e.g. HTN, arteriosclerosis. Eccentric LVH is associated with anaemia, volume overload. Clinical presentation of CVD: Ischaemic heart disease which could present as angina, myocardial infarction and sudden cardiac death, Cerebrovascular disease, Peripheral vascular disease, Heart failure and Uremic pericarditis and Pericardial effusion

Bone disease: Reduced calcium absorption results into hypocalcemia and causes Osteomalacia, Osteoporosis. Phosphate retention due to reduced excretion results hyperphosphotemia. Hypocalcemia and hyperphosphotemia causes secondary hyperparathyroidism. Hyperparathyroidism causes increased osteoclastic activity cause bone cyst formation, bone marrow fibrosis. It is known as osteitis fibrosis cystica

Investigation:

Search for underlying disease/probable cause and Establish diagnosis of CKD Measurement of albuminuria is helpful. 24 hour urine collection is "Gold standard". Measurement of albumin-to-creatinine ratio in a spot first morning urine sample is more practical, correlate well, but not perfectly with 24 hour urine collection. >17 mg of albumin/mg of creatinine in adult male and >25 mg of

albumin/mg of creatinine in adult female usually signifies chronic kidney disease.

Search complication: anemia, hyperkalemia, bone disease, etc. Dialysis preparation

Urine analysis : Hematuria with RBC cast, dysmorphic RBC suggests glomerulonephritis

Proteinuria: strongly suggests glomerular disease. Urine culture if any suggestion of pyelonephritis.. Urine microscopy: granular cast. Urine electrophoresis if any suggestion of myeloma

Serum biochemistry: urea, creatinine with calculation of GFR , electrolyte , calcium and phosphorus

USG: Contracted kidney in CKD, exception are diabetic nephropathy, amyloid nephropathy, HIV nephropathy, PKD, bilateral obstructive uropathy.

Complete blood count with Peripheral smear, Iron status and Viral marker

Renal biopsy: Technically difficult, Chance of More complication, Opportunity for disease specific therapy has passed. Rare Indication: suspicion of concomitant or superimposed active process

Treatment:

Renoprotection. Goals of treatment in presence of hypertension and diabetes BP < 120/80 mm. of Hg. HbA1c < 7% Proteinuria : ACE inhibitor, Add ARBs if goals are not achieved. Add diuretic to prevent hyperkalemia and control BP. Statin in all cases.

Protein restriction: Advocated to reduce symptoms associated with uremia. It may also slow renal decline. Modification of Diet in Renal Disease (MDRD) study has demonstrated no benefit with protein restriction. Kidney Disease Outcome Quality Initiative (KDOQI) guideline: 0.6-0.75gm/kg/day has shown some benefit and current practice recommendation. Stage 5 CKD spontaneous protein intake is diminished, if signs of malnutrition 0.9gm/kg/day are recommended.

Sodium and water retention: restrict sodium intake to 3-4gm/day. Thiazide diuretic no utility in 4-5 CKD. Add loop diuretic: furosemide, bumetamide, torsemide. The combination of loop diuretic with metolazone often causes better diuresis. Thiazide diuretics given once daily are recommended in patients with Stages 1-

3 .Loop diuretics given once or twice daily are recommended in Stages 4-5. Loop diuretics given once or twice daily, in combination with thiazide diuretics

Treatment of Hyperkalemia : Dietary restriction of potassium. Low-potassium foods can be allowed are Apples Beans (green or wax) Rice, Grapes, Cucum-ber, Noodles, Pears Onions, Watermelon, Cereal Cranberries, Cherries Stop drugs causes' potassium retention like ACEi, ARBs, Potassium sparing diuretics.

Treatment of hyperkalemia includes:

- 10 ml. of 10% calcium gluconate i.v over 5 minutes. Dose can be repeated after 15 minutes
- Insulin 10 units + 50% glucose i.v over 15 minutes
- Sodium bicarbonate when $\text{pH} < 6.9$
- Polysterene sulphonate: 15 gm. Orally t.d.s. with laxative
- Correction of acidosis helps to correct hyperkalemia

Treatment of hyperphosphatemia : Calcium carbonate or acetate reduces di-etary phosphate absorption. Other phosphate binders: Alluminium hydroxide, Savelamar , Lanthanum carbonate Calcitriol or vitamin D analogue

Treatment of Anemia: Epoitin alfa or beta. Longer acting darbopoitin also can be used Check Blood pressure, Hb , reticulocyte count every 2 months . Target Hb: 11-12 gm/dl

Dialysis: Hemodialysis, Peritoneal Dialysis

Indications of dialysis: signs of uremia (uremic encephalopathy, uremic gastritis, uremic pericarditis) metabolic acidosis, hyperkalemia not responding to medi-cal treatment, anasarca not responding to diuretic, pulmonary edema, difficult to control hypertension.

Coma

Coma is a state of complete behavioral unresponsiveness to external stimula-tion. Because some causes of coma may lead to irreversible brain damage, expeditious evaluation and treatment should be performed concurrently. The need for neurosurgical intervention must be determined promptly. Coma re-sults from diffuse or multifocal dysfunction within cerebral hemispheres or the reticular activating system in the brainstem. Examiner should query for risk fac-tors like, underlying neurodegenerative disorder or stroke and precipitating event (trauma or toxin ingestion) and history of seizures, alcohol in take, drugs use and any medication changes or stop recently. Causes of coma is wide like meta

bolic, infections, drugs, toxins, poisons, nutritional, seizures, stroke, head trauma, brain tumor and systemic organ failure. Prompt investigation as laboratories, imaging and diagnostic procedures is mandatory for establishing treatment.

Management of Coma patient.

Ensure adequate airway and ventilation, administer oxygen as needed, and maintain normal body temperature.

Establish secure i.v. and adequate circulation. Arterial, central venous and intracranial pressures may need to be monitored and treated depending on clinical circumstances.

A quiet, well-lit room with close observation is necessary. Make repeated attempts to reorient the patient and have a sister present if patient remain confused.

Medications.

I.v. thiamine (100mg), followed by dextrose (50ml. of 50% dextrose in water = 25g dextrose), should be administered. Thiamine is administered first because dextrose administration in thiamine – deficient patients may precipitate Wernickes encephalopathy.

I.v. naloxone (opiate antagonist), 0.01mg/kg, should be administered if opiate intoxication is suspected. Naloxone may provoke opiate withdrawal syndrome in addicted patients. Flumazenil (benzodiazepine antagonist), 0.2mg i.v., may reverse benzodiazepine intoxication, but its duration of action is short, and additional doses may be needed. Flumazenil can cause seizures.

In delirious patients, sedatives should be avoided if possible, but if necessary low doses of lorazepam (1mg) or chlordiazepoxide (25mg), can be used.

Other Nonoperative Therapies

If herniation is identified or suspected, treatment consists of measures to lower intracranial pressure while surgically treatable etiologies are indentified or excluded. All of the listed measures are only temporary methods. Consultation with neurosurgery should be performed concurrently.

Endotracheal intubation is usually performed to enable hyperventilation to a PCO₂ of 25 -30mmHg, which reduces intracranial pressure within minutes by cerebral vasoconstriction. Bag-mask ventilation can be performed if manipulation of the neck is precluded by possible or established spinal instability. Reduction of PCO₂ below 25mmHg is not recommended because it may reduce cerebral blood flow excessively.

Administration of mannitol I.v. 1 to 2gm/kg over 10 to 20 minutes osmotically

reduces free water in the brain via elimination by the kidneys. This effect peaks at 90 minutes.

Dexamethasone, 10mg I.v, followed by 4mg I.v. q6h, reduces the edema surrounding a tumor or an abscess.

Coagulopathy should be corrected if intracranial hemorrhage is diagnosed and before surgical treatment or invasive procedures (e.g., LP) are performed. Each patient circumstance should be carefully assessed before therapeutic anticoagulation is reversed.

Surgical Management: - Evacuation of epidural, subdural or ICH cerebellar, hydrocephalus may be lifesaving. Some are not amenable to surgical treatment.

Specific cause of coma if identified has to be managed accordingly like, hepatic coma, uremic coma, diabetic coma, coma due to dyselectrolytemia and other systemic derangement.

DIABETIC KETOACIDOSIS

Confirmation of Diagnosis :- Increased Plasma glucose, positive serum ketones , Metabolic acidosis.

Admission to hospital is needed & intensive care monitoring may be necessary for frequent monitoring or if pH <7.00 or unconscious .

Assessment of Serum electrolytes e.g. Sodium, Potassium, Magnesium, Chloride, bicarbonate, Phosphate & Acid-base status – pH, HCO_3^- , Pco_2 , β hydroxybutyrate, Renal function (creatinine, urine output) is urgently required . Replacement of fluids :- In first 1-3h, 2-3 litres of 0.9% saline is infused (15-20ml/kg per Hour) & subsequently, 0.45% saline at 150 -250ml /h when plasma glucose reaches 200mg/dl.

Short acting insulin administration :- A bolus of IV 0.1 unit / kg short acting insulin should be administered immediately & subsequently 0.1 unit/kg per hour by continuous IV infusion – increase to 2-3 fold if no response by 2-4h . If the initial serum potassium is >5.2 mmol /L Potassium is not supplemented until the potassium is corrected .

Assessment of Patient : - To find out the precipitating episode e.g. noncompliance, Infection , trauma , infarction , cocaine & to initiate appropriate work – up for precipitating event e.g. culture, CXR, ECG. Measurement of capillary glucose every 1-2h & measurement of electrolytes specially Potassium , bicarbonate, phosphate and anion gap every 4h. for first 24h Monitoring of blood pressure, pulse, respirations, mental status, fluid intake and output is needed in every 1-4h.

Potassium replacement : - 10meq/h when plasma Potassium is <5-5.2 meq/L (or 20-30 meq /L of infusion fluid) , ECG normal , urine flow and normal creatinine documented; administer 40-80 meq/h when plasma Potassium <3.5 meq/L or if bicarbonate is given.

Bicarbonate , phosphate, Magnesium supplementation: - Despite a bicarbonate deficit bicarbonate replacement is not usually necessary. In fact theoretical arguments suggest that bicarbonate administration and rapid reversal of acidosis may impair cardiac function, reduce tissue oxygenation and promote hypokalemia, However in the presence of severe acidosis (arterial pH < 6.9) , the ADA advises bicarbonate 50 mmol/L of sodium bicarbonate in 200 ml of sterile water with 10 meq/L Kcl per hour for 2h . until pH is >7.0. If the serum phosphate is < 0.32 mmol / L (1mg/dl) then phosphate supplement should be considered and the serum calcium monitored . Hypomagnesemia may develop during DKA therapy and may also require supplementation. .

Continuation of above strategy until patient is stable, glucose goal is 150-250 mg /dl and acidosis is resolved. Insulin infusion may be decreased to 0.05-0.1 unit /kg . per hour .

Administration of long acting insulin as soon as patient is eating . Allowance is given for overlap in insulin infusion and SC insulin injection.

HYPERTENSION

Treatment of Hypertension: JNC 8 guideline

Hypertension remains one of the most important preventable contributors to disease and death. Abundant evidence from randomized controlled trials(RCTs) has shown benefit of antihypertensive drug treatment in reducing important health outcomes in persons with hypertension.1-3 Clinical guidelines are at the intersection between research evidence and clinical actions that can improve patient outcomes. The Institute of Medicine Report Clinical Practice Guidelines We Can Trust outlined a pathway to guideline development and is the approach that this panel aspired to in the creation of this report.

The panel members appointed to the Eighth Joint National Committee (JNC 8) used rigorous evidence-based methods, developing Evidence Statements and recommendations for blood pressure (BP) treatment based on a systematic review of the literature to meet user needs, especially the needs of the primary care clinician.

JNC 8 RECOMMENDATION

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

JNC 8 Recommendations (continued)

- General nonblack population
 - Thiazides, CCB, ACEI, or ARB initially
- General black population
 - Thiazides or CCB initially
- CKD
 - Treatment should include ACEI or ARB
- Up-titrate or add therapy after 1 mo if BP goal not achieved
 - Don't use ACEI and ARB together
 - If > 3 drugs needed, refer to hypertension specialist

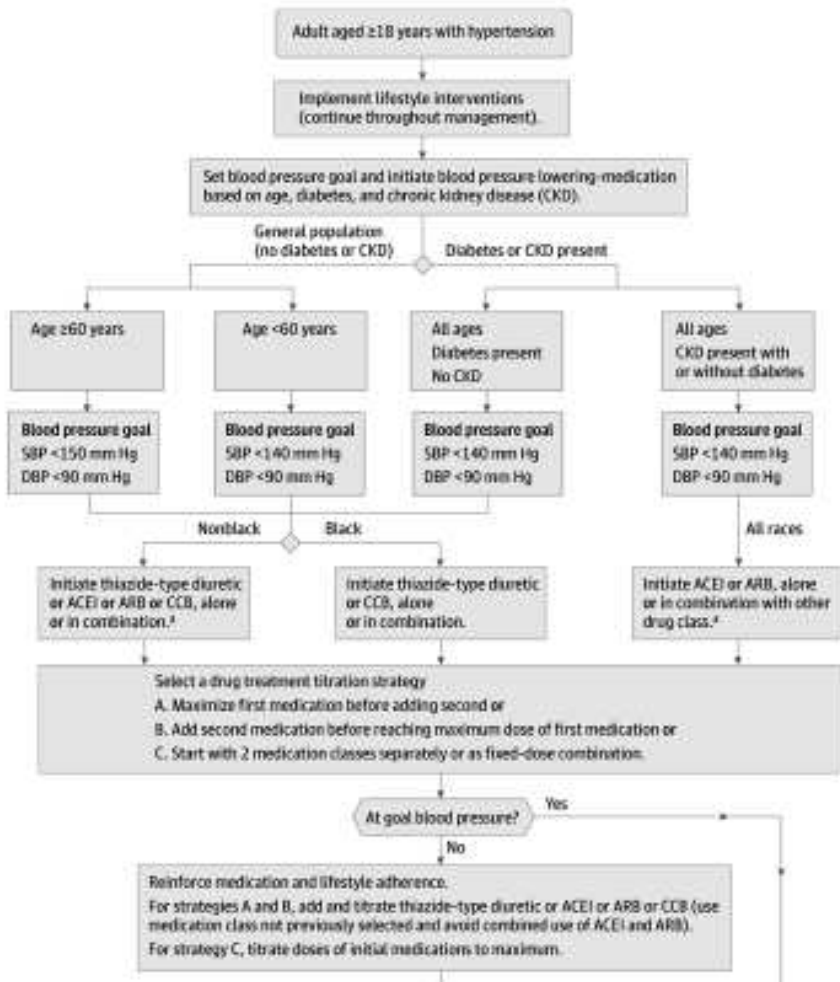
Table 4. Evidence-Based Dosing for Antihypertensive Drugs

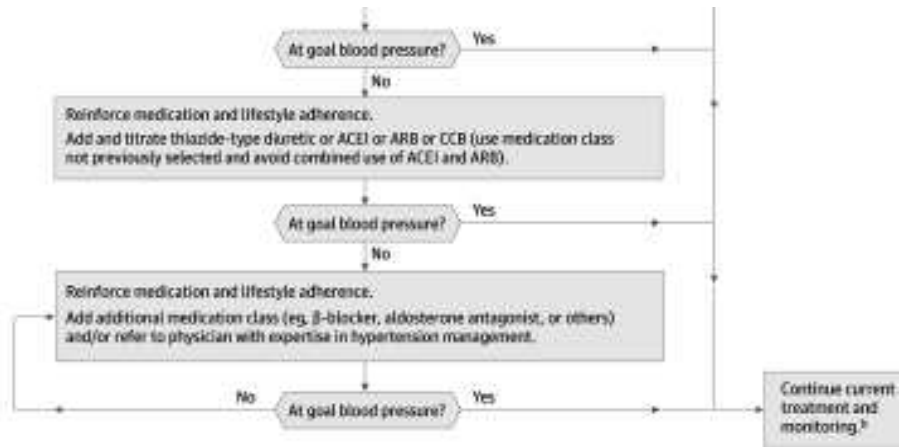
Antihypertensive Medication	Initial Daily Dose, mg	Target Dose in RCTs Reviewed, mg	No. of Doses per Day
ACE Inhibitors			
Captopril	50	150-200	2
Enalapril	5	20	1-2
Lisinopril	10	40	1
Angiotensin receptor blockers			
Eprosartan	400	600-800	1-2
Candesartan	4	12-32	1
Losartan	50	100	1-2
Valsartan	40-80	160-320	1
Irbesartan	75	300	1
β-Blockers			
Atenolol	25-50	100	1

Metoprolol	50	100-200	1-2
Calcium channel blockers			
Amlodipine	2.5	10	1
Diltiazem extended release	120-180	360	1
Nitrendipine	10	20	1-2
Thiazide-type diuretics			
Bendroflumethiazide	5	10	1
Chlorthalidone	12.5	12.5-25	1
Hydrochlorothiazide	12.5-25	25-100 ^a	1-2
Indapamide	1.25	1.25-2.5	1

Abbreviations: ACE, angiotensin-converting enzyme; RCT, randomized controlled trial.
^aCurrent recommended evidence-based dose that balances efficacy and safety is 25-50 mg daily.

Algorithm for treatment of hypertension : JNC 8 recommendation





TREATMENT PROPER

1) Nonpharmacologic therapy

A] Life Style Modification – Weight reduction who are over weight keeping BMI < 25/m², Dietary salt restriction – 6mg NaCl/day, Adopt DASH Type of dietary plan – diet rich in fruits, vegetables, low fat dairy products with reduced content of saturated & total fat, moderation of alcohol intake- Male < [60ml] 2drinks/day, Female < [30ml] 1drink/day, physical activity – regular aerobic activity per day 30min brisk walking, complete cessation of smoking.

Accelerated HTN – SBP>210,DBP>130- C/F- headache, blurred vision,focal neurological symptoms and with papilloedema-Malignant HTN- These two HTN emergencies to be treated with immediate reduction of BP by 20-25% to prevent or minimize end organ damage – In our set to be treated with iv Frusemide, iv Nitroglycerine infusion, iv Enalaprilat, iv Nitoprusside.

Malaria

Diagnosis of malaria

- Clinical diagnosis
- Parasitological diagnosis.

Parasitological diagnosis is two:-

- Light microscopy thick and thin smear.
- Rapid diagnostic test.

National Drug Policy on Malaria (2013)

Preamble

Malaria is one of the major public health problems of the country. Around 1.5 million laboratory confirmed cases of malaria are annually reported in India. Around 50% of the total malaria cases reported is due to *P.falciparum*. One of the reasons attributed to rise in proportion of *P.falciparum* cases is resistance to chloroquine, which was used for a long time as the first line of treatment of malaria cases. *P.falciparum* infections are known to lead to severe malaria, if timely treatment with effective drugs is not administered.

The National Drug Policy on Malaria was first formulated in 1982 and has subsequently been reviewed and revised periodically. The present National Drug Policy for Malaria (2013) has been drafted keeping in view the availability of more effective antimalarial drugs and drug resistance status in the country.

Early diagnosis and complete treatment is one of the key strategies of the National Malaria Control Programme. All fever cases clinically suspected of malaria should be investigated for confirmation of malaria by either microscopy or Rapid Diagnostic Test (RDT).

In high Pf predominant areas where it is not possible to get microscopy results within 24 hours, ASHAs/other community health volunteers/MPWs should be provided with rapid diagnostic kits and anti-malarials (including ACT) for early diagnosis and treatment of *P.falciparum* cases.

Effective treatment of malaria under the National Drug Policy aims at:

- Providing complete cure (clinical and parasitological) of malaria cases
- Prevention of progression of uncomplicated malaria into severe malaria and thereby reduce malaria mortality
- Prevention of relapses by administration of radical treatment
- Interruption of transmission of malaria by use of gametocytocidal drugs
- Preventing development of drug resistance by rational treatment of malaria cases.

Treatment of uncomplicated malaria

1. It is stressed that all fever cases should be suspected of malaria after ruling out other common causes and should be investigated for confirmation of malaria by Microscopy or Rapid Diagnostic Kit (RDK) so as to ensure treatment with full

therapeutic dose with appropriate drug to all confirmed cases.

2. The malaria case management is very important for preventive serious cases and death due to malaria. So, the private healthcare providers should also follow the common National Guidelines for treatment of malaria as per the Drug Policy 2013

3. *P. vivax* cases should be treated with chloroquine for three days and Primaquine for 14 days. Primaquine is used to prevent relapse but is contraindicated in pregnant women, infants and individuals with G6PD deficiency.

Note: Patients should be instructed to report back in case of haematuria or high colored urine / cyanosis or blue coloration of lips and Primaquine should be stopped in such cases. Care should be taken in patients with anaemia.

4. *P. falciparum* cases should be treated with ACT (Artesunate 3 days + Sulphadoxine-Pyrimethamine 1 day). This is to be accompanied by single dose primaquine preferably on day 2.

5. However, considering the reports of resistance to partner drug SP In North Eastern States, the Technical Advisory Committee has recommended to use the Coformulated tablet of ARTEMETHER(20 mg) - LUMEFANTRINE (120 mg (ACT-AL) as per the age-specific dose schedule for the treatment of Pf cases in North Eastern States (Not recommended during the first trimester of pregnancy and for children weighing < 5 kg)

6. Production and sale of Artemisinin monotherapy has been banned in India

7. Pregnant women with uncomplicated *P. falciparum* should be treated as follows:

- 1st Trimester: Quinine
- 2nd & 3rd Trimester: ACT

Note: Primaquine is contra indicated in pregnant woman

8. In cases where parasitological diagnosis is not possible due to non-availability of either timely microscopy or RDT, suspected malaria cases will be treated with full course of chloroquine, till the results of microscopy are received. Once the parasitological diagnosis is available, appropriate treatment as per the species, is to be administered.

9. Presumptive treatment with chloroquine is no more recommended.

10. Resistance should be suspected if in spite of full treatment with no history of vomiting, diarrhoea, patient does not respond within 72 hours, clinically and parasitologically. Such cases not responding to ACT, should be treated with oral quinine with Tetracycline / Doxycycline. These instances should be reported to concerned District Malaria /State Malaria Officer/ROHFW for initiation of therapeutic efficacy studies.

Treatment of Vivax Malaria

Diagnosis of vivax malaria may be made by the use of RDT (Bivalent) or microscopic examination of the blood smear. On confirmation following treatment is to be given:

Drug schedule for treatment of P vivax malaria:

- 1. Chloroquine:** 25 mg/kg body weight divided over three days i.e.
10 mg/kg on day 1,
10 mg/kg on day 2 and
5 mg/kg on day 3.
- 2. Primaquine*:** 0.25 mg/kg body weight daily for 14 days.

Primaquine is contraindicated in infants, pregnant women and individuals with G6PD deficiency.

14 day regimen of Primaquine should be given under supervision.

Dosage Chart for Treatment of Vivax Malaria

Age	Day 1		Day 2		Day 3		Day 4 to 14
	CQ (150 mg base)	PQ (2.5 mg)	CQ (150 mg base)	PQ (2.5 mg)	CQ (150 mg base)	PQ (2.5 mg)	PQ (2.5 mg)
Less than 1 yr	½	0	½	0	¼	0	0
1-4 years	1	1	1	1	½	1	1
5-8 years	2	2	2	2	1	2	2
9-14 years	3	4	3	4	1½	4	4
15 yrs or more*	4	6	4	6	2	6	6
Pregnancy	4	0	4	0	2	0	0

Note: CQ 250mg tablet is having 150 mg base

Treatment of Falciparum Malaria

Diagnosis of falciparum malaria may be made by the use of RDT (Monovalent or Bivalent) or microscopic examination of the blood smear. It is imperative to start the treatment for falciparum malaria immediately on diagnosis. The treatment for falciparum malaria is as follows:

In Other States (other than North-Eastern States):

1. Artemisinin based Combination Therapy (ACT-SP)*

Artesunate (AS), available as 50 mg tablets are given for three days, and Sulfadoxine-Pyrimethamine (S-P) tablets, containing 500 mg Sulfadoxine and 25 mg pyrimethamine are given for one day, as shown in the dosage chart below.

All tablets for a day should be taken together, swallowed with water.

In addition, Primaquine (PQ Large) tablets should be given on the second day.

Dose schedule for Treatment of uncomplicated P.falciparum cases:

1. Artemisinin based Combination Therapy (ACT-SP)*

Artesunate 4 mg/kg body weight daily for 3 days Plus Sulfadoxine (25 mg/kg body weight) – Pyrimethamine (1.25 mg/kg body weight) on first day.

* ACT is not to be given in 1st trimester of pregnancy.

2. Primaquine*: 0.75 mg/kg body weight on day 2.

With the introduction of different coloured Blister Packs for different age groups, treatment by the field level staff has been made easy. The colour code for different age groups for Packing of Tablet ACT+SP has been given as follows:

Dosage Chart for Treatment of falciparum Malaria with ACT-SP

Age Group (Years)	1 st day		2 nd day		3 rd day
	AS	SP	AS	PQ	AS
0-1* Pink Blister	1 (25 mg)	1 (250 +12.5 mg)	1 (25 mg)	Nil	1 (25 mg)
1-4 Yellow Blister	1 (50 mg)	1 (500+25 mg each)	1 (50 mg)	1 (7.5 mg base)	1 (50 mg)

5-8 Green Blister	1 (100 mg)	1 (750+37.5 mg each)	1 (100 mg)	2 (7.5 mg base each)	1 (100 mg)
9-14 Red Blister	1 (150 mg)	2 (500+25 mg each)	1 (150mg)	4 (7.5 mg base each)	1 (150 mg)
15 & Above White Blister	1 (200 mg)	2 (750+37.5 mg each)	1 (200 mg)	6 (7.5 mg base each)	1 (200 mg)

* SP is to be prescribed for children <5 months of age and should be treated with alternate ACT

* ACT-AL is not to be prescribed for children weighing less than 5 kg.

In North-Eastern States (NE States):

1. ACT-AL Co-formulated tablet of ARTEMETHER(20 mg) - LUMEFANTRINE (120 mg)

(Not recommended during the first trimester of pregnancy and for children weighing < 5 kg)

Recommended regimen by weight and age group

The packing size for different age groups based on Kg bodyweight.

Co-formulated tablet ACT-AL	5–14 kg (> 5 months to < 3 years)	15–24 kg (≥ 3 to 8 years)	25–34 kg (≥ 9 to 14 years)	> 34 kg (> 14 years)
Total Dose of ACT-AL	20 mg/ 120 mg twice daily for 3 days	40 mg /240 mg twice daily for 3 days	60 mg /360 mg twice daily for 3 days	80 mg /480 mg twice daily for 3 days
	Pack size			
No. of tablets in the Packing	6	12	18	24
Give	1 Tablet twice daily for 3 days	2 Tablets twice daily for 3 days	3 Tablets Twice daily for 3 days	4 Tablets Twice daily for 3 days
Colour of the pack	Yellow	Green	Red	White

2. Primaquine*: 0.75 mg/kg body weight on day 2

Treatment of uncomplicated P.falciparum cases in pregnancy:

1st Trimester : Quinine salt 10mg/kg 3 times daily for 7 days.

Quinine may induce hypoglycemia; pregnant women should not start taking quinine on an empty stomach and should eat regularly, while on quinine treatment.

2nd and 3rd trimester: Area-specific ACT as per dosage schedule given above.

i.e. **ACT-AL in North Eastern States**

ACT-SP in Other States

Primaquine (PQ) prevents transmission of falciparum malaria to others by its ability to kill gametocytes. PQ tablets should be taken after a meal; not on an empty stomach. Children less than the age of one year and pregnant women should not be given Primaquine. As pregnant women having falciparum malaria require different medicines, they should be directed to go to the nearest PHC or hospital immediately, without delay.

Treatment of mixed infections (P.vivax + P.falciparum) cases:

All mixed infections should be treated with full course of ACT and Primaquine 0.25 mg per kg body weight daily for 14 days.

In North-Eastern States: Treat with: Age-specific ACT-AL for 3 days + Primaquine 0.25 mg per kg body weight daily for 14 days.

In Other States: SP-ACT 3 days + Primaquine 0.25 mg per kg body wt. daily for 14 days.

Dosage Chart for Treatment of mixed (vivax and falciparum) Malaria with ACT-SP

Age	Day 1			Day 2		Day 3		Days 4-14
	AS tablet (50 mg)	SP tablet	PQ (2.5 mg)	AS tablet (50 mg)	PQ (2.5 mg)	AS tablet (50 mg)	PQ (2.5 mg)	PQ (2.5 mg)
Less than 1 yr	½	½	0	½	0	½	0	0
1-4 years	1	1	1	1	1	1	1	1
5-8 years	2	1 ½	2	2	2	2	2	2
9-14 years	3	2	4	3	4	3	4	4
15 yrs or more	4	3	6	4	6	4	6	6

Treatment of *P. ovale* and *P. malariae*:

In India these species are very rarely found in few places. *P. ovale* should be treated as *P. vivax* and *P. malariae* should be treated as *P. falciparum*.

Treatment of mixed infections:

All cases of mixed infection are to be treated as Pf as per the drug policy applicable in the area plus primaquine for 14 days

Treatment of severe malaria cases

Severe malaria is an emergency and treatment should be given as per severity and associated complications which can be best decided by the treating physicians. Before admitting or referring patients, the attending doctor or health worker, whoever is able to do it, should do RDT and take blood smear; give a parenteral dose of artemisinin derivative or quinine in suspected cerebral malaria cases and send case sheet, details of treatment history and blood slide with patient. Parenteral artemisinin derivatives or quinine should be used irrespective of chloroquine resistance status of the area with one of the following options:

Chemotherapy of severe and complicated malaria

Initial parenteral treatment for at least 48 hours: CHOOSE ONE of following four options	Follow-up treatment, when patient can take oral medication following parenteral treatment
<p>Quinine: 20mg quinine salt/kg body weight on admission (IV infusion or divided IM injection) followed by maintenance dose of 10 mg/kg 8 hourly; infusion rate should not exceed 5 mg/kg per hour. Loading dose of 20mg/kg should not be given, if the patient has already received quinine.</p>	<p>Quinine 10 mg/kg three times a day with: doxycycline 100 mg once a day or clindamycin in pregnant women and children under 8 years of age, - to complete 7 days of treatment.</p>
<p>Artesunate: 2.4 mg/kg i.v. or i.m. given on admission (time=0), then at 12 h and 24 h, then once a day. or Artemether: 3.2 mg/kg bw i.m. given on admission then 1.6 mg/kg per day.</p>	<p>Full oral course of Area-specific ACT: In NorthEastern states: Age-specific ACT-AL for 3 days + PQ Single dose on second day</p>

<p>or Arteether: 150 mg daily i.m for 3 days in adults only (not recommended for children).</p>	<p>In other states: Treat with: ACT-SP for 3 days + PQ Single dose on second day</p>
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Note: The parenteral treatment in severe malaria cases should be given for minimum of 24 hours once started (irrespective of the patient's ability to tolerate oral medication earlier than 24 hours).

After parenteral artemisinin therapy, patients will receive a full course of Area-specific oral ACT for 3 days. Those patients who received parenteral Quinine therapy should receive oral Quinine 10 mg/kg body weight three times a day for 7 days (including the days when parenteral Quinine was administered) plus Doxycycline 3 mg/kg body weight once a day or Clindamycin 10 mg/kg body weight 12-hourly for 7 days (Doxycycline is contraindicated in pregnant women and children under 8 years of age) or area-specific ACT as described.

Note:

- Pregnant women with severe malaria in any trimester can be treated with artemisinin derivatives, which, in contrast to quinine, do not risk aggravating hypoglycaemia.
- The parenteral treatment should be given for minimum of 48 hours
- Once the patient can take oral therapy, give:
 - Quinine 10 mg/kg three times a day with doxycycline 100 mg once a day or clindamycin in pregnant women and children under 8 years of age, to complete 7 days of treatment, in patients started on parenteral quinine.
 - Full course of ACT to patients started on artemisinin derivatives.
 - Use of mefloquine should be avoided in cerebral malaria due to neuropsychiatric complications associated with it.

Some don'ts in severe malaria case management

Do not use corticosteroids, give intravenous mannitol, use heparin as anticoagulant, administer adrenaline or overhydrate.

Chemoprophylaxis

Chemoprophylaxis should be administered only in selective groups in high P.falciparum endemic areas. Use of personal protection measures including

Insecticide Treated bed Nets (ITN) / Long Lasting Insecticidal Nets (LLIN) should be encouraged for pregnant women and other vulnerable population including travellers for longer stay. However, for longer stay of Military and Para-military forces in high Pf endemic areas, the practice of chemoprophylaxis should be followed wherever appropriate e.g. troops on night patrol duty and decisions of their Medical Administrative Authority should be followed.

Short term chemoprophylaxis (up to 6 weeks)

Doxycycline: 100 mg once daily for adults and 1.5 mg/kg once daily for children (contraindicated in children below 8 years). The drug should be started 2 days before travel and continued for 4 weeks after leaving the malarious area.

Note: It is not recommended for pregnant women and children less than 8 years.

Chemoprophylaxis for longer stay (more than 6 weeks)

Mefloquine: 250 mg weekly for adults and should be administered two weeks before, during and four weeks after exposure.

Note: Mefloquine is contraindicated in individuals with history of convulsions, neuropsychiatric problems and cardiac conditions. Therefore, necessary precautions should be taken and all should undergo screening before prescription of the drug.

Note: The treatment matrix for different situations like unavailability of Microscopy in 24 hours, Microscopy available, where Bi-valent RDT is available is given in Annexure-1.

References:

1. National Drug Policy for Malaria 2010, NVBDCP, MoH&FW, Govt. of India, 2010.
2. Operation Manual for Malaria Control for District level Officers. NVBDCP, 2008.
3. Record Note of the Meeting of Technical Advisory Committee, NVBDCP, 2013.
4. Website of National Vector Borne Disease Control Programme
5. World Health Organization (2006). WHO Guidelines for the Treatment of Malaria. Geneva World Health Organization

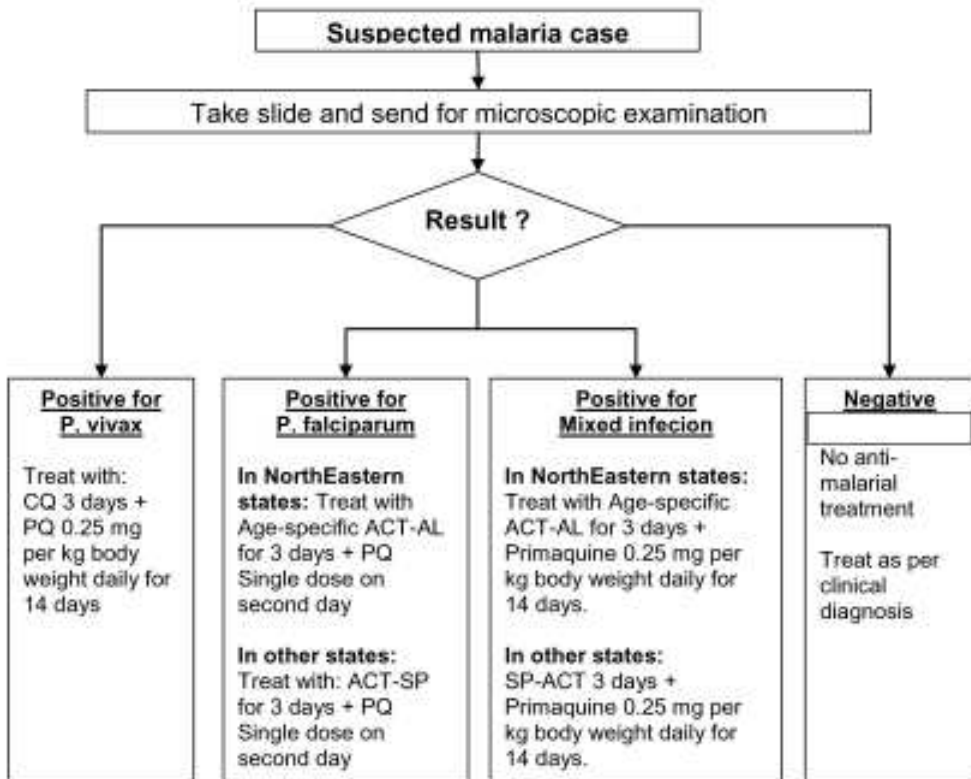
Annexure-1

DRUG SCHEDULE FOR TREATMENT OF MALARIA UNDER NVBDCP

Diagnosis and Treatment for Malaria

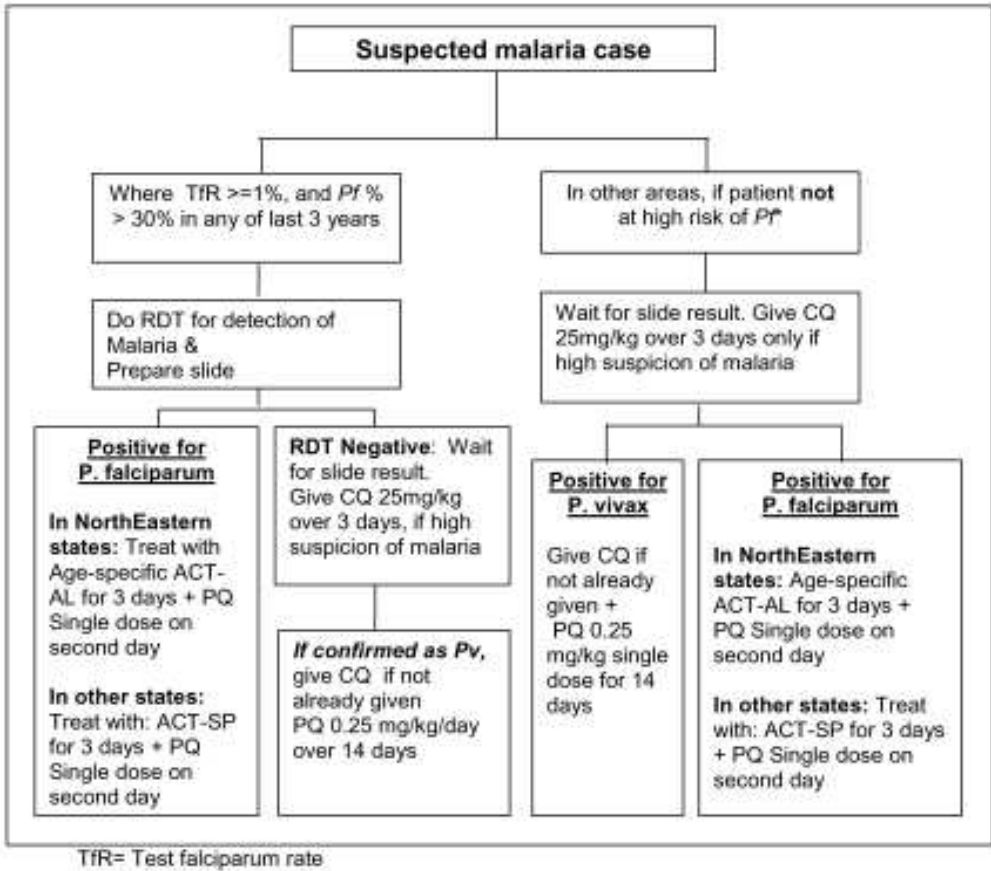
All fever cases diagnosed as malaria by either RDT or microscopy should be promptly given effective treatment. The medicine chosen will depend upon whether the patient has vivax malaria or falciparum malaria as diagnosed by the blood test. The flow charts in different settings for diagnosis and drug selection for the treatment of malaria are as under:

Where microscopy result is available within 24 hours



ACT-AL - Artemisinin-based Combination Therapy- Artemether - Lumefantrine
 ACT-SP- Artemisinin-based Combination Therapy (Artesunate+Sulfadoxine-Pyrimethamine)
 CQ - Chloroquine
 PQ - Primaquine

Where microscopy result is not available within 24 hours and Monovalent RDT is used



Note: if a patient has severe symptoms at any stage, then immediately refer to a nearest PHC or other health facility with indoor patient management or a registered medical doctor.

Note: PQ is contra-indicated in pregnancy and in children under 1 year (Infant).

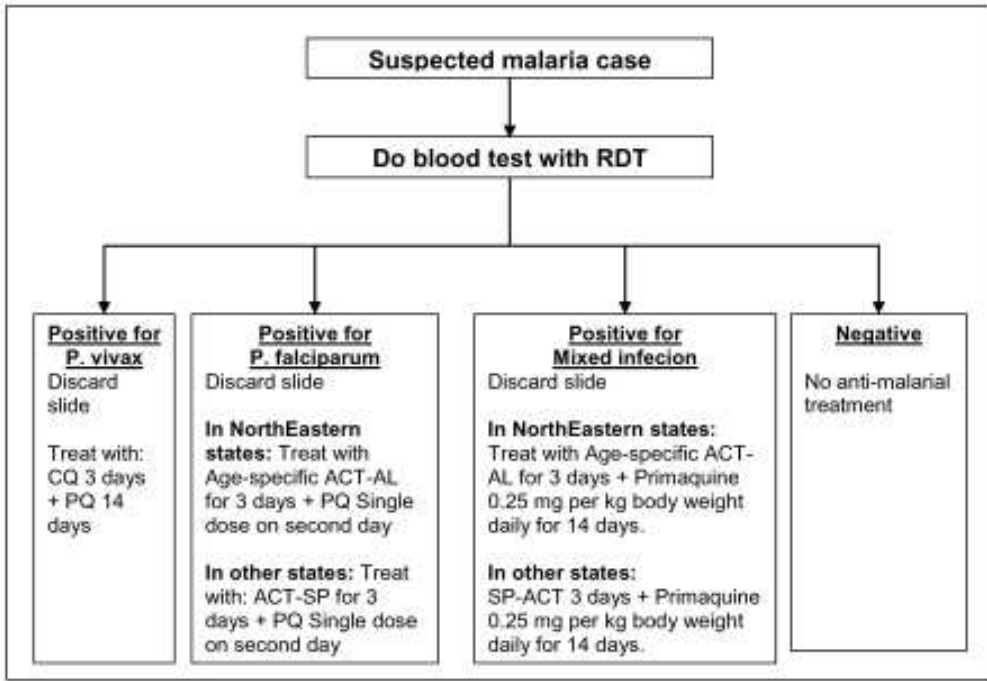
ACT-AL - Artemisinin-based Combination Therapy- Artemether - Lumefantrine

ACT-SP- Artemisinin-based Combination Therapy (Artesunate+Sulfadoxine-Pyrimethamine)

CQ - Chloroquine

PQ - Primaquine

Where microscopy result is not available within 24 hours and Monovalent RDT is used



Note:

- 1) However, if malaria is strongly suspected, prepare & send slide for microscopy.
- 2) If a patient has severe symptoms at any stage, then immediately refer to a nearest PHC or other health facility with indoor patient management or a registered medical doctor.
- 3) PQ is contra-indicated in pregnancy and in children under 1 year (Infant).

Note: PQ is contra-indicated in pregnancy and in children under 1 year (Infant).

ACT-AL - Artemisinin-based Combination Therapy- Artemether - Lumefantrine

ACT-SP- Artemisinin-based Combination Therapy (Artesunate+Sulfadoxine-Pyrimethamine)

CQ - Chloroquine

PQ - Primaquine

ORGANOPHOSPHOROUS POISONING

INTRODUCTION :

O.P. Compounds are used to kill agricultural pests in rural areas. These are available as dusts, granules or liquids. In human these compounds produce occupational hazards by getting absorbed through transdermal or inhalational routes. It is absorbed by the G. I. Tract when consumed for suicidal purpose. Toxic manifestation begin within a few minutes but it may appear after several hours.

SALIENT FEATURES :

1) Autonomic effects :

Increased salivation, lacrimation, miosis, urination, abdominal cramps, vomiting, diarrhoea, sweating, bradycardia, hypotension, fasciculation and paralysis.

2) CNS effects :

Drowsiness, restlessness, convulsion, & death usually occur due to respiratory failure.

TREATMENT :

1) Non pharmacological :

a. In case of external contamination, further exposure should be prevented, contaminated clothing and contact lenses removed.

b. The airway should be cleared of excessive secretions and high flow O₂ administered.

c. The skin should be washed with soap and water and the eyes irrigated.

d. Gastric lavage or activated charcoal may be considered within 1 hour of ingestion.

2) Pharmacological :

a. Inj Atropine should be given in doses of 0-6-2mg I/V repeated every 10-25

mins till secretions are controlled, the skin is dry, and there is sinus tachycardia and pupils are dilated. Keep the patient atropinised till the poisonous effect weans off.

b. Inj pralidoxime (PAM)- The dose for an adult is 2gm I/V over 5 mins, repeated 4-6 hourly. Maximum dose 12 gm in 24 hours. .

c. Convulsion = Inj diazepam 5-10 mg I/V or Inj Clonazepam 2-4 mg I/V

d. Ventilatory support should be instituted if patient develops respiratory failure.

3) *Therapeutic dialogue* :

a. The relatives should be informed that the patient should contact the doctor since patient may develop "delayed syndrome" usually after 2-3 weeks which is characterized by flaccid weakness of limb muscles.

b. The patient should consult a psychiatrist to find out the cause of poisoning in case of suicidal attempt.

SEPTICEMIA WITH SEPTIC SHOCK

Patients in whom sepsis is suspected must be managed expeditiously. Successful management requires urgent measures to treat the infection, to provide hemodynamic and respiratory support and eliminate the offending microorganisms. These measures should be initiated within 1h. of the patients presentation with severe sepsis or septic shock. Rapid assessment and diagnosis are therefore essential.

Antimicrobial agents :- Antimicrobial chemotherapy should be started as soon as samples of blood and other relevant sites have been obtained for culture. It is very important to promptly initiate empirical antibiotic therapy that is effective against both gram-positive and gm-negative bacteria. Maximum recommended doses of antimicrobial drugs should be given intravenously, with adjustment for impaired renal function when necessary. Available information regarding patterns of antimicrobial susceptibility among bacterial isolates from the community, the hospital and the patient should be taken into account. When the culture results become available, the regimen can often be simplified, as a single agent is usually adequate for the treatment of a known pathogen. Empirical antifungal therapy should be strongly considered if the septic patient is already receiving broad spectrum antibiotic or parenteral nutrition, has been neutropenic for =5 days, has had a long-term central venous catheter, or has been hospitalized in an intensive care unit for a prolonged period.

Most patients require antimicrobial therapy for at least 1 week . The duration of treatment is typically influenced by factors such as the site of tissue infection, the adequacy of surgical drainage, the patients underlying disease and the antimicrobial susceptibility of the microbial isolates. The absence of an identified microbial pathogen is not necessarily an indication for discontinuing antimicrobial therapy, since , “appropriate” antimicrobial regimens seem to be beneficial in both culture – negative and culture positive cases.

Removal of the source of infection :- Removal or drainage of a focal source of infection should be sought carefully, particularly in the lungs, abdomen and urinary tract. Indwelling IV or arterial catheters should be removed and the tip rolled over a blood agar plate for quantitative culture, after antibiotic therapy has been initiated, a new catheter should be inserted at a different site. Foley and drainage catheter should be replaced. The possibility of Paranasal sinusitis (often caused by gram-negative bacteria) should be considered if the patient has undergone nasal intubation. Even in patients without abnormalities on chest radiographs, CT of the chest may identify unsuspected parenchymal, mediastinal, or pleural disease. In the neutropenic patients, cutaneous sites of tenderness and erythema, particularly in the perianal region, must be carefully sought. In patients with sacral or ischial decubitus ulcers, it is important to exclude pelvic or other soft tissue pus collections with CT or MRI. In patients with severe sepsis arising from urinary tract, sonography or CT should be used to rule out ureteral obstruction, perinephric abscess, and renal abscess. Sonographic or CT imaging of the upper abdomen may disclose evidence of cholecystitis, bile duct dilatation and pus collections in the liver, subphrenic space, or spleen. Initial Antimicrobial therapy for severe sepsis with no obvious source in adults with normal Renal function .

Clinical Status:-

Immunocompetent adult :- Piperacillin-tazobactam(3.375gq4-6h) imipenem – cilastatin (0.5g q6h.) or Meropenem (1g q8h) or cefepime (2g q12h) Ciprofloxacin (400mg q12h)or Levofloxacin (500-750mg q 12h) if allergic to β lactam agents plus Clindamycin (600mg q8h) . Vancomycin (15mg/Kg q12h) Should be added to each of the above regimen

Neutropenia (<500 neutrophils μ l :-

- (1) Imipenem–cilastatin (0.5g q8h) or Meropenem(1g q8h) or cefepime (2g q8h)
- (2) Piperacillin – tazobactam (3.375g q4h) plus tobramycin(5-7mg/Kg q24h) vancomycin (15mg/kg q12h) should be added if the patient has an ind

welling vascular catheter, has received quinolone prophylaxis, or has received intensive chemotherapy that produces mucosal damage; if staphylococci are suspected; If the institution has a high incidence of MRSA infections, or if there is a high prevalence of MRSA isolates in the community. Empirical antifungal therapy with echinocandin (for caspofungin: a 70-mg loading dose, then 50mg . daily) or a lipid formulation of amphotericin B should be added if the patient is hypotensive or has been receiving broad-spectrum antibacterial drugs.

Splenectomy : - Cefotaxime (2g q6-8h) or ceftriaxone (2g q12h) should be used. If the local prevalence of cephalosporin – resistant Pneumococci is high , add vancomycin. If the patient is allergic to β -lactam drugs, vancomycin (15mg/kg q12h) plus either Moxifloxacin (400mg q24h) or Levofloxacin(750mg q24h) or aztreonam (2g q8h) should be used.

IV drug user : - Vancomycin (15mg/kg q12h)

AIDS : - Cefepime (2g q8h) or Piperacillin – tazobactam (3.375g q4h) plus tobramycin (5-7mg/kg q24h) should be used. If allergic to ~~XXXX~~-lactam drugs then ciprofloxacin (400mg q12h) or Levofloxacin (750mg q12h) plus vancomycin (15mg/kg q12 h) plus tobramycin should be used.

Haemodynamic, Respiratory & Metabolic Support : - Primary goals are to restore adequate oxygen and substrate delivery to the tissues as quickly as possible and to improve tissue oxygen utilization and cellular metabolism. Adequate oxygen perfusion is thus essential. Circulatory adequacy is assessed by measurement of arterial blood pressure and monitoring of parameters such as mentation, urine output and skin perfusion. Indirect indices of oxygen delivery and consumption such as central venous oxygen saturation , may also be useful. Initial management of hypotension should include the administration of IV fluids, typically beginning with 1-2 litre of Normal saline over 1-2h. To avoid pulmonary edema, the central venous pressure should be maintained at 8-12 cm. H₂O. The urine output should be kept at >0.5ml/kg/hr by continuing fluid administration, a diuretic such as furosemide may be used if needed. In about one third of patients, hypotension and organ hypoperfusion respond to fluid resuscitation, a reasonable goal is to maintain a mean arterial blood pressure of >65 mm of Hg (systolic pressure >90mm Hg). If these guidelines can not be met by volume infusion, vasopressor therapy is indicated. Titrated doses of Norepinephrine or dopamine should be administered through a central catheter. Norepinephrine should be started at a dose of 2 to 4 μ g/ min and titrated upward as necessary. If systemic perfusion or systolic pressure can not be maintained at >90 mm Hg with a dose of 15 μ g/min it is unlikely that a further increase will be

beneficial. Dopamine has varying hemodynamic effects based on the dose, at low doses (=2 µg /kg permin) it dilates the renal vascular bed, at moderate doses (2-10 µg/kg permin) it has positive chronotropic and inotropic effects as a consequence of β adrenergic receptor stimulation. At higher doses, a vasoconstrictor effect results from α receptor stimulation. It is started at an infusion rate of 2-5µg/kg /min to a maximum of 20-50 µg/kg per min. If myocardial dysfunction produces elevated cardiac filling pressure and low cardiac output, inotropic therapy with dobutamine is recommended. Dobutamine is used as 2 to 20 µg/kg per min. IV.

Critical illness related corticosteroid insufficiency (CIRCI) should be strongly considered in patient who develop hypotension that does not respond to fluid replacement therapy. Hydrocortisone (50 mg IV every 6h) should be given; if clinical improvement occurs over 24-48 h. most experts would continue hydrocortisone therapy for 5-7 days before slowly tapering and discontinuing it.

Ventilator therapy is indicated for progressive hypoxemia, hypercapnia, neurologic deterioration or respiratory muscle failure. Sustained tachypnoea (respiratory rate >30 breaths/min) is frequently a harbinger of impending respiratory collapse; mechanical ventilation is often indicated to ensure adequate oxygenation, to divert blood from the muscles of respiration, to prevent aspiration of oropharyngeal contents and to reduce the cardiac afterload. Results of recent studies favour the use of low tidal volumes (6 ml/kg of ideal body weight, or as low as 4 ml/kg if the plateau pressure exceeds 30 cm H2O). patients undergoing mechanical ventilation require careful sedation, with daily interruptions, elevation of the head of bed helps to prevent nosocomial pneumonia. Stress-ulcer prophylaxis with a histamine H2 receptor antagonist may decrease the risk of gastrointestinal haemorrhage in ventilated patients. Erythrocyte transfusion is generally recommended when the blood haemoglobin level decreases to = 7g/dl, with a target level of 9g/dl in adults. Bicarbonate is sometime administered for severe metabolic acidosis (arterial PH <7.2) but there is little evidence that it improves either hemodynamics or the response to vasopressor hormones. DIC, if complicated by major bleeding should be treated with transfusion of fresh-frozen Plasma and platelets. Successful treatment of underlying infection is essential to reverse both acidosis and DIC. Patients who are hypercatabolic and have acute renal failure may greatly benefit from intermittent hemodialysis or continuous veno-venous hemofiltration.

General Support :- In patients with prolonged severe sepsis i,e lasting more than 2 or 3 days nutritional supplementation may reduce the impact of protein hypercatabolism, the available evidence, which is not strong, favors the enteral delivery route. Prophylactic heparinization to prevent deep venous thrombosis

is indicated for patients who do not have active bleeding or coagulopathy; when heparin is contraindicated, compression stockings or intermittent compression device should be used. Most experts now recommend using insulin only if it is needed to maintain the blood glucose concentration below ~ 150mg/dl. Patients receiving intravenous insulin must be monitored frequently every 1-2hr for hypoglycaemia.

Activated Protein C :- Functional endogenous Protein C is deficient in some septic patients, which has a profound effect on the progression of sepsis and the development of organ failure. The use of recombinant human-activated Protein C (rhAPC, drotrecogin alfa) has been advocated in the most severe cases of sepsis. Among the numerous mechanism by which activated Protein C reduces the complications of sepsis are by blocking thrombin production, decreasing phagocyte chemotaxis and adhesion, inhibiting tissue factor and proinflammatory cytokines, minimizing apoptosis of lymphocytes and endothelial cells and inhibiting the suppression of fibrinolysis. As expected by its mechanism of action, patients administered drotrecogin alfa have an increased risk of serious bleeding events, including intracranial haemorrhage and gastrointestinal (GI) bleeding, so it should not be used in patients at risk for hemorrhage, recent surgery or anticipated need for surgery.

Snake bite

Types of snake bite in Tripura

- a) Non poisonous snake bite
- b) Poisonous snake bite.

Poisonous snake bite of Two types-

- i) Neurotoxic snake bite
- ii) Vasculotoxic snake bite.

Local signs at the site of bite

- a) Fang marks
- b) Local pain
- c) Local bleeding
- d) Bruising
- e) Lymphangitis
- f) Lymph node enlargement
- g) Inflammation
- h) Blistering
- i) Necrosis

Systemic Signs

Vasculotoxic

Bleeding from fang marks, Venepunctures from gums, epistaxis, haemoptysis, haematemesis, haematuria, malena, vaginal bleeding, purpura, echymoses, visual disturbances, dizziness, faintness, shock, cardiac arrhythmia, pulmonary edema, cardiovascular collapse.

Neurotoxic

Nausea, vomiting, weakness, prostration paraesthesia, heavy eyelids, ptosis, paralysis of facial muscles, external ophthalmoplegia, cranial nerve palsy, difficulty in swallowing, dribbling of saliva, aphonia, generalized flaccid paralysis, respiratory muscles paralysis & Abdominal pain in krait bite.

Management (Initial management)

Most traditional first aid methods should be discouraged ;they do more harm than good which include making local incisions, sucking blood, tying tight bands.

Recommended first aid method include

- a) Reassure the patient
- b) Immobilize the bitten limb with splint or sling and consider pressure immobilization.
- c) Transfer to hospital.

Antivenom treatment

Indications of antivenom treatment

Local

Rapid Extension of swelling of the bitten Limb involving more than half of the limb.

Presence of blisters and echymoses over the bitten limb and bleeding from fang marks.

Development of tender Lymph nodes.

Systemic

Ptosis, External ophthalmoplegia, drowsiness , spontaneous systemic bleeding, hypotension, shock, dark brown urine.

Test to be done at bed side.

- a) ECG.-which will show cardiac arrhythmias
- b) 20 mins WBCT.

Administration of antivenom

The initial dose of antivenom is empirical usually ten vials of antivenom is taken as the first dose.

The antivenom are available in vials. Each vial is diluted in 10ml of sterile water and then the whole diluted antivenom(100ml as the first dose) is further suspended in 500ml of normal saline or 5% dextrose and the whole diluted dose is infused intravenous in onehour.

Since its made from horse serum, chances of hypersensitivity reaction to horse serum is there, care should be taken before hand, with inj.adrenaline and inj steroids.

Criteria for giving more antivenom.

1. Six hours after the initial dose the same dose is repeated.
2. Deteriorating neurotoxic or cardiovascular signs after one hour.
3. Persistence of bleeding after one hour
4. 20 min WBCT continues to be positive.

STATUS EPILEPTICUS

Definition : Condition in which epileptic seizures continue, or are repeated without recovery, for a period of 30 minutes or more. Refers to continuous seizures or repetitive, discrete seizures with impaired consciousness in the interictal period. International League Against Epilepsy(ILAE) defines StEp. as a seizure that persists for a sufficient length of time or is repeated frequently enough that recovery between attacks does not occur.

Points to be remembered at onset of treatment :

- (1)Cardiorespiratory dysfunction
- (2) Hyperthermia
- (3) Metabolic derangements.
- (4) Venous access
- (5) Airway
- (6)Lab. Samples.
- (7) AED or Alcohol withdrawal.

- (9) Oxygen
- (10) ABG
- (11) EKG
- (12) Pulse Oxymetry
- (13) Vitals monitoring.
- (14) Metabolic acidosis, hypoxia.
- (15) I.V. glucose & thiamine.
- (16) AED level
- (17) Serum electrolyte & magnesium.

Treatment :

- (1) Generalised Tonic Clonic for adult

= DIAZEPAM – I.V. push 0.2mg/kg, at a rate of 5mg/min.

Useful for seizure stopping, not for prevention.

Duration of action 10 to 20 min.

As it suppresses respiration, preparation for artificial respiration to be kept ready.

= LORAZEPAM – 0.1 – 0.15mg/kg I.V. over 1- 2min.(At a rate of 2mg/min)

May suppress respiration but less likely as compared to other benzodiazepine Diazepam. It acts more slowly than diazepam but its effective duration of Action is 8 to 10 hours, making it recommended as initial treatment of StEp. After 5min. dose can be repeated if no response.

= FOSPHENYTOIN – 18-20mg/kg PE(Phenytoin equivalents) I.V. at a maximum Rate of 150mg/min.[Fosphenytoin loading dose 27mg/kg dissolved in iv fluid. Less prone to cause hypotension & cardiac arrhythmias. Can be given more rapidly. Can be given I.M.

= PHENYTOIN – I.V. loading dose 18-20 mg/kg, dissolved in NORMAL SALINE & infused at a rate no faster than 50mg/min. To look for hypotension, cardiac arrhythmias, bradycardia. Cannot be given I.M. or in glucose containing iv fluids.

If seizures continues on above medications,

Additional 10mg/kg iv Fosphenytoin, or Valproate 25-30mg/kg iv over 15min or Or to intubate & under EEG monitoring,
Midazolam – 0.2mg/kg iv bolus, followed by continuous infusion 0.1 mg/kg/hr or,
Propofol – 1-2mg/kg iv load, followed by iv infusion 2mg/kg/hr,

Pentobarbital – 5mg/kg load 50mg/min followed by infusion of 1mg/kg/hr or Titrate above medications to seizure suppression or EEG background suppression.

If no ICU access but seizures continuing after administration of Lorazepam,

Fosphenytoin/Phenytoin, Valproate to consider

Phenobarbital – 20mg/kg in iv fluids iv loading dose & infused at a rate of 60-100mg/min. It is highly sedating & can depress respiration & can cause hypotension.

Valproic acid – 20-30mg/kg dissolved in iv fluids, infused at a rate of 20-50mg/min. Useful in patients who cannot take oral dose or whose serum level is low. Caution in liver dysfunction or mitochondrial disease. Pancreatitis have been reported on iv Valproate.

= LEVETIRACETAM – Intravenous use has been shown to be safe & effective

In treating adult & children with convulsive & nonconvulsive status epilepticus and with Acute repetitive seizures [Repeated myoclonic, clonic, tonic or tonic-clonic seizures – each seizure lasting less than five minutes with recovery of consciousness between each seizure] that had persisted for at least 30 minutes irrespective of whether they had treated with any emergency medication (a benzo

diazepine alone or a benzodiazepine with either Phenytoin or Phenobarbital).

Dose – 10mg/kg, can be increased upto 30mg/kg iv over 10-15min.

EFNS guideline on the management of StEp. in adults :

European Journal of Neurology 2010,17:348-355

Generalised convulsive StEp(GCSE) :

Preferred treatment pathway iv administration of 0.1mg/kg Lorazepam.

Depending on the patient's general condition, the clinician may decide to start treatment at a lower dose of 4mg & repeat the dose if StEp is not terminated

Within 10min. A single shot of 10mg has proven to be sufficient in more than 80%

Successful in StEp patient treatment.

If iv lorazepam is not available 10mg Diazepam directly followed by 18mg/kg Phenytoin or equivalent Fosphenytoin may be given instead. Phenytoin should be

Loaded rapidly with an infusion rate at 50mg/min.

If possible prehospital treatment is recommended and GCSE iv administration of

2mg Lorazepam is as effective as 5mg Diazepam.

Complex partial StEp.(CPSE) should be treated initially in the same way as GCSE. Subtle StEp evolving from previously overt GCSE in most patients will have been Treated with anticonvulsants. In previously untreated subtle StEp the initial anti-convulsent treatment should be identical to that of overt GCSE.

General management of Refractory StEp(RSE):

GCSE that does not respond to initial AED needs to be treated on an intensive care Unit basis. (AG)

Pharmacological treatment for refractory generalized convulsive and subtle StEp:

To reduce the risk of brain & systemic damage, to proceed immediately to the Infusion of anaesthetic doses of Midazolam, Propofol, Barbiturate(AG)

= barbiturate – Thiopental 3-5mg/kg bolus stat, then further boluses of 1-2mg/kg Every 2-3min until seizure is controlled, thereafter continuous infusion rate of 3-7mg/kg/hr. Alternatively Pentobarbital(first metabolite of thiopental) – bolus Dose of 5-15mg/kg over 1hr followed by an infusion of 0.5-1mg/kg/hr, increasing

If necessary to 1-3mg/kg/hr.

= Midazolam – 0.2mg/kg iv bolus, followed continuous infusion at rate of 0.05-0.4 Mg/kg/hr.

= Propofol – Initial iv bolus of 2-3mg/kg, then further boluses at 1-2mg/kg until Seizure is controlled, then continuous infusion at 4-10mg/kg/hr.

Monitoring – for Midazolam – seizure control, for barbiturate & propofol EEG Burst suppression.

For elderly patients in whom intubation & artificial ventilation would not be justified, further non anaesthetising anticonvulsants may be tried.

Pharmacological treatment for refractory complex partial StEp:

= Phenobarbital – Initial iv bolus 20mg/kg iv infusion rate of 50mg/min,

Administration of additional boluses requires intensive care conditions.

= Valproic acid – iv bolus of 25-45mg/kg infused at rates of upto 6mg/kg/min.

= Levetiracetam – iv bolus of 1000-3000mg administered over a period of 15min.

If the treatment regimen includes the administration of anaesthetics, the same protocol

Applies as described for refractory GCSE.

INVESTIGATIONS REQUIRED

1. Complete blood count
2. RBS
3. Urea, creatinine
4. Na⁺, K⁺, Ca⁺⁺, Mg⁺⁺
5. Liver Function Tests
6. Arterial Blood Gas analysis
7. MRI of brain with Gadolinium contrast
8. EEG

STROKE

Stroke is a medical emergency that requires rapid diagnosis and treatment. The hallmark of stroke is the abrupt interruption of blood flow to a specific area of region resulting in neurologic deficits.

Fluctuation of functional deficits after stroke onset or a brief deficit known as transient ischemic attack which suggests tissue at risk for infarction that may be rescued by re-establishing perfusion.

EPIDEMIOLOGY

More than 500,000 strokes occur per year and it is the third leading cause of death in the United States.

ETIOLOGY

Ischemic stroke can be sub classified into atherothrombotic, embolic, or hypoperfusion related.

Atherothrombosis results from reduced flow within an artery or embolism of thrombus into distal segment of artery.

Atherosclerosis is the most common etiology of thrombus formation in large vessels.

Less common etiologies include dissection, fibromuscular dysplasia, Moyamoya, giant cell arteritis. Lipohyalinosis usually due to hypertension is the most common etiology of small vessel disease. Cardioembolic stroke account for about 20% of all ischemic strokes.

TRATMENT GUIDELINE

Vital signs monitoring -B.P. Control if Systolic BP>220 and/or Diastolic BP>120mm Hg.

Medication-Administration of rtPA must commence within 4.5 hours of stroke onset but may increase risk of I.C.H.Exclusion criteria for rtPA include head trauma,G.I. bleeding,recent surgery,low platelet < 1 Lac and B.P. Systolic > than 185mm Hg .

Asprin initial dose 325 mg within 24 Hours of stroke onset . The dose may be reduced to 81 mg in the post acute stroke period.

Others antiplatelet drugs (clopidogrel,dipyridamole) are available and may be of benefit for certain patient .

Mannitol 20% 100 ml 6 hourly for three days if signs of raised ICT are present
Others supportive cares and fluid restriction is advised .

HEMORRHAGIC STROKE

occurs in about 20% of all cases . Subtypes are
Intraparenchymal hemorrhage (IPH) .

Subarachnoid hemorrhage (SAH).

Conservatives-Vitalsigns monitoring,oxygen inhalation, I.V.Fluids ,Electrolytes monitoring and B.P. Control and other supportive care.

I.V. Manitol 20% 100ml. 6 Hourly for three days and observe for signs of raised ICT.

Broad-spectrum antibiotic may be used.

Seizure if present managed with AEDS.

SURGICAL MANAGEMENT

Patient with cerebellar hemorrhage .

Subarachnoid hemorrhage .

Carotid endarterectomy decreases the risk of stroke.

Lifestyle/ Risk Modification

Blood pressure reduction even in normotensive stroke patients is beneficial .

O.C.P. may need to be discontinued in women.

TREATMENT OF HYPOGLYCAEMIA

Isolated episodes of mild hypoglycemia may not require specific intervention .
Recurrent episodes require a review of lifestyle factors, adjustments may be indicated in the content, timing and distribution of meals, as well as medication dosage and timing. Severe hypoglycaemia is an indication for supervised treatment .

Readily absorbable carbohydrates e.g. glucose and sugar containing beverages can be administered orally to conscious patients for rapid effect. Alternatively milk, candy bars, fruit and crackers may be used in some patients with mild hypoglycemia. Hypoglycemia associated with acarbose or miglitol therapy should preferentially be treated with glucose. Glucose tablets and carbohydrate supplies should be readily available to patients with Diabetes mellitus at all times.

I.V. Dextrose is indicated for severe hypoglycemia, in patients with altered consciousness and during restriction of oral intake. An initial bolus of 20-50ml of 50% Dextrose should be given immediately, followed by infusion of D5W or D10W to maintain blood glucose level above 100mg/dl. Prolonged IV dextrose infusion and close observation is warranted in sulfonylurea overdose, in the elderly and in patient with defective counterregulation

Glucagon 1mg. IM or SC is an effective initial therapy for severe hypoglycemia in patients unable to receive oral intake or in whom IV access can not be secured immediately, vomiting is a frequent side effect and therefore care should be taken to prevent the risk of aspiration. A glucagon kit should be available to patients with a history of severe hypoglycemia, family members and roommates should be instructed in its proper use.

Prevention of Recurrent hypoglycemia :- offending drugs can be discontinued or their dose reduced, Hypoglycemia caused by a sulfonylurea can persist for hours or even days. Underlying critical illness can often be treated. Cortisol and growth hormone can be replaced if they are deficient, Surgical, radiotherapeutic or chemotherapeutic reduction of a non islet cell tumor can alleviate hypoglycemia even if the tumor can not be cured, glucocorticoid or growth hormone administration also may reduce hypoglycemic episodes in such patients, surgical resection of an insulinoma is curative, medical therapy with diazoxide or octreotide can be used if resection is not possible and in patients with a nontumor beta-cell disorder. Partial pancreatectomy may be necessary in the latter patients. The treatment of Autoimmune hypoglycemia e.g. with a glucocorticoid or immunosuppressive drugs is problematic but the disorders are sometimes self limited. Failing these treatments, frequent feedings and avoidance of fasting may be required. Administration of uncooked corn-starch at bedtime or even an overnight intragastric infusion of glucose may be necessary in some patients.

UPPER G.I. BLEEDING

UGI Bleeding manifests as either hematemesis or Melena. Hematemesis is vomiting of red blood or "Coffee ground" material whereas melaena is passage of black, tarry and foul smelling stool. It commonly occurs in Peptic ulcer, Gastric erosions, Ruptured esophageal varices and gastric carcinoma.

TREATMENT:

1) NONVARICEAL BLEEDING :

1) Intravenous access :- The first step is to gain IV access using at least one large bore cannula.

2) Initial clinical assessment:

a) Define circulatory status – Severe bleeding causes tachycardia, hypotension, oliguria. The patient is cold and sweating and may be agitated.

b) Seek evidence of liver disease – Jaundice, hepatosplenomegaly and ascites may be present in decompensated cirrhosis.

c) Identify comorbidity - The presence of cerebrovascular, cardiorespiratory or renal disease is important. Because these may be worsened by acute bleeding and they increase the hazards of endoscopy and surgical operations.

3) *Basic investigations :*

- Full blood Count, urea, electrolytes, LFT, PT.
- Cross matching of at least 2 units of whole blood.

4) Resuscitation:

- Iv fluid = Normal saline/ Ringer lactate.
- Transfuse blood if blood pressure remains low and patient is actively bleeding.
- Oxygen should be given to all patients in shock.

5) *Drugs:* Inj omeprazole / pantoprazole 80 mg bolus, then 8 mg / hour continuous infusion for 72 hrs reduces bleeding in peptic ulcer..

6) *Endoscopy* = Organise endoscopy for diagnosis and treatment. Peptic ulcers that are actively bleeding or have a protuberant vessel or adherent blood clot are treated endoscopically using Injection (adrenaline), heater probe or metallic clips.

7) *Monitoring :*

Perform hourly measurement of Blood pressure, pulse and urine output. Consider CVP monitoring in severe bleeding.

1) Surgery :

Surgery is indicated when endoscopic homeostasis fails to stop active bleeding and if rebleeding occurs on one occasion in an elderly patient or twice in a younger patient.

2) VARICEAL BLEEDING :

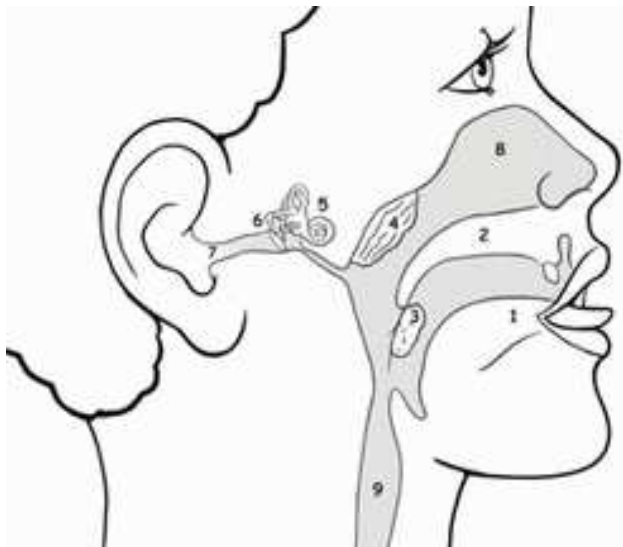
- 1) IV Fluid = Normal Saline
- 2) Antibiotics = IV Cephalosporin or oral ciprofloxacin reduces incidence of SBP.
- 3) Pharmacological reduction of portal venous pressure – Terlipressin is given IV 2 mg 6 hourly until bleeding stops and then 1 mg 6 hourly for further 24 hours.
- 4) Endoscopic therapy :
 - Banding Ligation and sclerotherapy.
 - Prophylactic acid suppression with PPI
- 5) Balloon tamponade :

Active bleeding at endoscopy may make endoscopic therapy difficult, in such cases bleeding should be controlled by Balloon tamponade prior to endoscopic therapy.
- 6) TIPSS : (Transjugular intrahepatic portosystemic shunting). This technique uses a stent placed between the portal vein and the hepatic vein within the liver to provide portosystemic shunt and therefore reduce portal pressure.
- 7) Oesophageal transection –

Transection of the varices can be done with stapling gun. This is used when TIPSS is not available and when bleeding cannot be controlled by other therapies.

Chapter III

ENT



EPISTAXIS:

AT PHC LEVEL-

- HOSPITALISATION/ AMBULANAT
- IF THE PATIENT IS IN SHOCK SECURE I.V LINE- REPLACE FLUID AND ELECTROLYTE , TREATMENT OF SHOCK
- HYPERTENSIVE PATIENTS - TREAT WITH SODIUM NITROPRUSSIDE 50 MG IN 500 ML BOTTLE INFUSED AT 0.02 MG/MIN OR ENALAPRIL 5- 20 MG DILUTED IN 20 ML IN 20ML OF RL/ DISTILLED WATER TO BE INFUSED OVER 10 MIN OR AMLODEPIN 5 MG ± ATENOLOL.
- TRY CONSERVATIVE APPROACH- COMPRESSION, APPLICATION OF ICE PACK ON THE BRIDGE OF NOSE.
- PERFORM HEMOGRAM, CHECK HAMATOCRIT VALUE
- ANTERIOR EPISTAXIS - ANTERIOR NASAL PACKING (ANP) WITH RIBBON GAUGE SOAKED WITH ANTIBIOTIC OINTMENT / LIQUID PARAFFIN.
- SUPPORTIVE TREATMENT- INJECTION AMPILOX 500 MG 6 HOURLY / INJECTION CEFTRIAXONE 1GM IV DAILY , INJ DIAZEPAM 10MG/ 2ML BD FOR 2 DAYS
- SEVERE POSTERIOR EPISTAXIS (LIFE THREATENING) - INSERT FOLEY'S TUBE CATHETER ALONG WITH ANP AND TRANSFER THE PATIENTS TO DISTRICT HOSPITAL.

AT CHC LEVEL –

- SAME AS PHC.

AT SUB DIVISIONAL HOSPITAL LEVEL –

- SAME AS PREVIOUS LEVEL
- BLOOD TRANSFUSION- IF FACILITY IS AVAILABLE.

AT DISTRICT HOSPITAL LEVEL –

- SAME AS PREVIOUS LEVEL.
- ENT SURGEON EXAMINES THE PATIENT.
- BLOOD TRANSFUSION- REPLACEMENT IF REQUIRED.

- MINOR ANTERIOR BLEEDING- CHEMICAL CAUTERIZATION WITH 50% TRICHLOROACETIC ACID UNDER LA.
- ANTERIOR RHINOSCOPIC EXAMINATION FOLLOWED BY ANTERIOR NASAL PACKING WITH RIBBON GAUGE SOAKED WITH ANTIBIOTIC OINTMENT / LIQUID PARAFFIN.
- FOR POSTERIOR EPISTAXIS- POST NASAL PACKS TO BE DONE UNDER GA.
- REST OF THE STEPS SIMILAR TO PREVIOUS LEVEL.
- IF BLEEDING IS NOT CONTROLLED BY THE ABOVE MEASURES- TRANSFER THE PATIENT TO STATE HOSPITAL/ MEDICAL COLLEGE HOSPITAL.

AT STATE HOSPITAL LEVEL-

- SAME AS ABOVE
- DIAGNOSTIC NASAL ENDOSCOPY MAY BE PERFORMED AND BLEEDING VESSELS MAY BE COAGULATED WITH BIPOLAR DIATHERMY.
- OTHERWISE TRANSFER THE PATIENT TO MEDICAL COLLEGE HOSPITAL

AT MEDICAL COLLEGE HOSPITAL LEVEL –

- SAME AS PRIMARY LEVEL AND STATE HOSPITAL LEVEL
- IF ABOVE MEASURES FAILS – LIGATION OF MAXILLARY ARTERY OR EXTERNAL CAROTID MAY BE CONTEMPLATED

A. FOREIGN BODY OF LARYNX, TRACHEA & BRONCHI:

AT PHC LEVEL-

- SPECIFIC SIGNS OF F.B. IN THE RESPIRATORY TRACT VIZ DIFFICULTY IN RESPIRATION, STRIDOR, AND RECESSION OF SUPRASTERNAL NOTCH, XIPHISTERNUM, INTERCOSTALS MUSCLES AND CYANOSIS SHOULD BE LOOKED FOR.
- INSPIRATORY STRIDOR – LIKELIHOOD OF F.B. TO BE AT OR ABOVE THE LEVEL OF LARYNX ; EXPIRATORY STRIDOR – POSSIBILITY OF F.B. TO AT BRONCHUS; BIPHASIC STRIDOR- FB AT SUB GLOTTIS AND TRACHEA
- IN F.B. OF UPPER AIRWAY 'HEIMLICH MANEUVER' MAY BE ATTEMPTED- BY PLACING BOTH THE CLOSED FISTS OF MEDICAL ATTENDENT AT XYPHISTERNEM FROM STANDING BEHIND THE PATIENT AND EXERTING SUDDEN PRESSURE AT EPIGASTRIUM.

- IN CASE OF CHILDREN- HELD THE BABY IN UPSIDE DOWN POSITION BY HOLDING THE LEGS UP THEN GIVE A SUDDEN TAP ON THE BACK IN BETWEEN THE TWO SCAPULAE OTHERWISE TRANSFER THE PATIENT TO STATE LEVEL HOSPITAL OR MEDICAL COLLEGE HOSPITAL

AT CHC LEVEL –

- SAME AS ABOVE
- X- RAY CHEST MAY BE PERFORMED TO CONFIRM RADIOPAQUE F.B.

AT SUB DIVISIONAL HOSPITAL LEVEL –

- SAME AS ABOVE
- X- RAY CHEST MAY BE PERFORMED TO CONFIRM RADIOPAQUE F.B.

AT DISTRICT HOSPITAL LEVEL-

- SAME AS ABOVE

AT STATE HOSPITAL LEVEL-

- SAME AS ABOVE
- FLEXIBLE OR RIGID BRONCHOSCOPY TO BE PERFORMED TO REMOVE THE FOREIGN BODY

AT MEDICAL COLLEGE HOSPITAL LEVEL –

- SAME AS ABOVE
- FLEXIBLE OR RIGID BRONCHOSCOPY TO BE PERFORMED TO REMOVE THE FOREIGN BODY

C. TRAUMA NECK

AT PHC LEVEL-

- HOSPITALISATION
- SECURE ABC - AIRWAY , BREATHING ,CIRCULATION
- AIRWAY- SHOULD BE SECURED BY POSITIONING THE HEAD OF THE PATIENT AND ADVANCING THE LOWER JAW FORWARD OR PLACING OROPHARYNGEAL AIRWAY
- BREATHING.
- CIRCULATION – INTRAVENOUS LINE SHOULD BE ESTABLISHED IMMEDIATELY BLOOD LOSS SHOULD BE APPROPRIATELY CORRECTED BY VOLUME EXPANDERS LIKE DEXTRAN. OR CRYSTALLOID SOLUTION
- SUPPORTIVE THERAPY - INJECTION AMPICILLIN AND CLOXACILLIN 500 MG 6 HOURLY , INJ. DICLOFENAC 1 AMP TWICE DAILY , INJ. HYDROCORTISONE 100MG 8 HOURLY MAY BE ADDED
- TRANSFER THE PATIENT TO DISTRICT LEVEL HOSPITAL OR STATE LEVEL HOSPITAL
- IF PATIENT HAS ASSOCIATED HOARSENESS OR SIGNS OF NEUROLOGICAL DEFICIT OR UNCONSCIOUSNESS TRANSFER THE PATIENT TO MEDICAL COLLEGE HOSPITAL

AT CHC LEVEL –

- SAME AS ABOVE

AT SUB DIVISIONAL HOSPITAL LEVEL –

- SAME AS BEFORE

AT DISTRICT HOSPITAL LEVEL-

- SAME AS BEFORE
- X- RAY SOFT TISSUE NECK ANTERO- POSTERIOR AND LATERAL VIEWS MAY BE PERFORMED
- CONSULTATION WITH OTHER SPECIALTY LIKE ORTHOPEDICS AND SURGERY FOR ASSOCIATED INJURIES
- SURGICAL AIRWAY INTERVENTION LIKE INTUBATIONS OR TRACHEOTOMY MAY BE PERFORMED IF NECESSARY
- NECK MAY BE EXPLORED UNDER GENERAL ANESTHESIA AND DEEPER INJURIES MAY BE MANAGED INCLUDING LEGATION OF NECK VESSELS.

AT STATE HOSPITAL LEVEL-

- SAME AS BEFORE

AT MEDICAL COLLEGE HOSPITAL LEVEL –

- SAME AS BEFORE
- RECONSTRUCTION OF FRACTURES OF LARYNGEAL CARTILAGE, INJURIES TO THE GREAT VESSELS OF NECK TRANSECTIONS OF CERVICAL VISCERA TO BE MANAGED INCLUDING SURGICAL INTERVENTION OF AIRWAY, IF ANY REQUIRED.

D. LARYNGEAL EDEMA

AT PHC LEVEL-

- HOSPITALISATION
- INJECTION HYDROCORTISONE 100 MG IM STAT FOLLOWED BY 8 HOURLY
- INJECTION AIL AMP 1 M STAT AND ONCE DAILY
- AN INJECTION OF ADRENALINE (1:1 000) 0.3-0.5 ML I.M., MAY BE REPEATED IN 15 MINUTES
- WITH PERSISTENT RESPIRATORY DISTRESS, TRANSFER THE PATIENT TO STATE LEVEL HOSPITAL OR MEDICAL COLLEGE HOSPITAL FOR RESPIRATORY INTERVENTION

AT CHC LEVEL-

- SAME AS ABOVE

AT SUB DIVISIONAL HOSPITAL –

- SAME AS ABOVE

AT DISTRICT HOSPITAL LEVEL –

- SAME AS ABOVE
- IF THE RESPIRATORY OBSTRUCTION IS PERSISTENT, LARYNGEAL INTUBATION MAY HAVE TO BE CONSIDERED. ON ANTICIPATION OF PROLONG INTUBATION SURGICAL INTUBATION , TRACHEOSTOMY SHOULD BE CONSIDERED

AT STATE HOSPITAL –

- SAME AS ABOVE

AT MEDICAL COLLEGE HOSPITAL –

- SAME AS ABOVE
- FLEXIBLE LARYNGOSCOPY UNDER LA MAY BE PERFORMED FOR EVALUATION

E. ACUTE EPIGLOTTITIS

AT PHC LEVEL-

- HOSPITALISATION
- INJECTION HYDROCORTISONE 100 MG IM STAT FOLLOWED BY 8 HOURLY
- INJECTION AMPICILLIN 500 MG IV 6 HOURLY WITH INJECTION GENTAMYCIN 80MG IV 12 HOURLY
- SUPPORTIVE THERAPY- INTRAVENOUS FLUIDS, INJECTABLE NASAL
- AN INJECTION OF ADRENALINE (1:1 000) 0.3-0.5 ML I.M., MAY BE REPEATED IN 15 MINUTES
- WITH PERSISTENT RESPIRATORY DISTRESS, TRANSFER THE PATIENT TO STATE LEVEL HOSPITAL OR MEDICAL COLLEGE HOSPITAL FOR RESPIRATORY INTERVENTION

AT CHC LEVEL-

- SAME AS ABOVE

AT SUB DIVISIONAL HOSPITAL –

- SAME AS ABOVE

AT DISTRICT HOSPITAL LEVEL –

- SAME AS ABOVE
- IF THE RESPIRATORY OBSTRUCTION IS PERSISTENT, LARYNGEAL INTUBATION MAY HAVE TO BE CONSIDERED. ON ANTICIPATION OF PROLONG INTUBATION SURGICAL INTUBATION , TRACHEOSTOMY SHOULD BE CONSIDERED

AT STATE HOSPITAL –

- SAME AS ABOVE
- BLOOD CULTURE TO BE PERFORMED

AT MEDICAL COLLEGE HOSPITAL –

- SAME AS ABOVE

F. DEEP NECK SPACE INFECTION

AT PHC LEVEL-

- HOSPITALISATION
- INJECTION AMPICILLIN 500 MG IV 6 HOURLY WITH INJECTION GENTAMYCIN 80MG IV 12 HOURLY, INJ.METRONIDAZOLE 7.5 MG /KG IN 6 HOURLY DOSAGE
- SUPPORTIVE THERAPY- INTRAVENOUS FLUIDS, INJECTABLE NASAL
- BLOOD SUGAR ESTIMATION DONE
- WITH PERSISTENT RESPIRATORY DISTRESS, TRANSFER THE PATIENT TO STATE LEVEL HOSPITAL OR MEDICAL COLLEGE HOSPITAL FOR RESPIRATORY INTERVENTION

AT CHC LEVEL-

- SAME AS ABOVE

AT SUB DIVISIONAL HOSPITAL –

- SAME AS ABOVE

AT DISTRICT HOSPITAL LEVEL –

- SAME AS ABOVE
- IF THE RESPIRATORY OBSTRUCTION IS PERSISTENT, LARYNGEAL INTUBATION MAY HAVE TO BE CONSIDERED. ON ANTICIPATION OF PROLONG INTUBATION SURGICAL INTUBATION , TRACHEOSTOMY SHOULD BE CONSIDERED
- ABCESS SHOULD BE TREATED WITH INCISION AND DRAINAGE UNDER GA
- PUS SHOULD BE CULTURED FOR SENSITIVITY
- BLOOD SUGAR ESTIMATION DONE

AT STATE HOSPITAL –

- SAME AS ABOVE

AT MEDICAL COLLEGE HOSPITAL –

- SAME AS ABOVE
- CT SCAN OF NECK TO BE PERFORMED FOR ASSESSMENT OF EXTENSION
- INCISION & DRAINAGE WITH WOUND DEBRIDEMENT TO BE DONE

G. CHRONIC SUPPURATIVE OTITIS MEDIA (CSOM) THREATENING INTRA CRANIAL OR EXTRA CRANIAL COMPLICATION

AT PHC LEVEL-

INDEX OF SUSPICION:- A PATIENT, YOUNG ADULT IN PARTICULAR, PRESENTED WITH DEATH SEALED PAIN EAR, HEADACHE, VOMITING, LOSS OF BALANCE, HIGH FEVER WITH CHILL AND RIGOR WITH HISTORY OF LONG STANDING DISCHARGING EAR WITH BLOOD OR EMITTING BAD SMELL EVEN PERCEIVED FROM A DISTANCE MUST BE SUSPECTED FOR LIFE THREATENING COMPLICATIONS LIKE.

- (A) MASTOIDITIS.
- (B) LABYRINTHITIS
- (C) FACIAL NERVE PARALYSIS
- (D) MENINGITIS.
- (E) BRAIN ABSCESS.
- (F) JUGULAR VENOUS THROMBOSIS ETC.

AT PHC LEVEL MANAGEMENT:

PATIENT TO BE REFERRED TO STATE LEVEL HOSPITAL OR MEDICAL COLLEGE HOSPITAL AT THE EARLIEST OTHERWISE

HOSPITALIZATION

I.V. CHANNEL TO BE ESTABLISHED.

ING. CIPROFLOXACIN I.V. 12 HOURLY

ING.GENTAMICIN 80 MG 12 HOURLY.

ING. ANALGESIC.

MUST BE REFERRED TO ENT SPECIALIST FOR SURGICAL INTERVENTION

AT CHC LEVEL:-

- SAME AS ABOVE

AT SUB DIVISIONAL LEVEL: -

- SAME AS ABOVE

AT DISTRICT LEVEL:

- SAME AS ABOVE

INVESTIGATION AND TREATMENT SHOULD RUN SIMULTANEOUSLY AND SURGICAL EXPLORATION BY ENT SURGEON IF NEEDED.

MEDICAL COLLEGE HOSPITAL:

- SAME AS ABOVE

INVESTIGATION AND TREATMENT TO BE CONTINUED SIMULTANEOUSLY. DELAY IN TREATMENT IN THE PLEA OF ARRIVAL RESULT OF INVESTIGATION REPORTS MAY BE IN A SITUATION LIKE, DIAGNOSIS IS EVIDENT BUT TREATMENT IS FUTILE"

Chapter IV

DERMATOLOGY



1. PRIMARY CARE DERMATOLOGY

Diagnostic Guidelines for Skin Problems

There are many types of Skin lesions :

- Macules - Flat lesions-same level as of skin- maybe small or big
- Papules - The skin is raised- usually small but may be large also.
- Vesicles - The skin is raised and there is fluid inside
- Bullae - The skin is raised and ballooned and there is fluid inside
- Abscess - The skin is raised and there is pus inside
- Pustule - The skin is raised, there is pus and the pus is draining out.
- Squamous lesion - The skin is dry and scaly
- Weeping lesion - there is watery fluid oozing from the lesion
- Crusts - the fluid and dead skin form flakes that stick and can be peeled off.
- Also look for scratch marks - indicates it is itchy.
- Also look for the black dot of the insect bite.

Most patients with skin problems present late. By then they have scratched and this has got secondarily infected and now the feature is of the secondary bacterial infection. We need to treat this secondary infection and examine again to find out the primary cause.

Diagnosis rests usually on recognising the clinical pattern. Sometimes microscopy of scrapings of the lesion can confirm the diagnosis.

Here are some hints for diagnosis :

Did it start suddenly (over one or two days or even over one or two hours) ?

If yes :

- Think of urticaria – may start over minutes; presents with many papules that often change shape over hours; is always itchy; and often associated with insect bite or allergy. Rarely there maybe an associated difficulty in breathing. If this develops it is an emergency
- If not think of herpes simplex – vesicular lesions start over a few hours. Often occurs as part of fever and some other serious infection. Often around or in mouth, on face, or in eyes.
- If the same type of vesicular lesions are in one or more lines in dermatomal distribution and they are very painful think of Herpes Zoster.

Have skin lesions been there long- over a few weeks?

If Yes, the possibilities are:

- Impetigo : Presents with pustules and crusts and scratch marks. This is usually secondary bacterial infection.
- Scabies : Presents with many scratch marks and few small papules, vesicles especially between fingers or toes. This usually comes along with impetigo.
- Ring worm (not due to a worm but due to fungus) : Tinea cruris If there is large macule with scaling towards the edges And it is very itchy.
- Ringworm can also present as distorted nails, wet reddish lesions between toes, or area of loss of hair and itching over scalp (tinea capitis)

Skin scrapings for KOH mount microscopy show plenty of small hyphae that confirm diagnosis.

- Pityriasis (tinea versicolor) : if there are large macules which are of lighter colour than surrounding skin - this is a type of ringworm infection - but it does not itch and there is no loss of sensation.
- Leprosy : If there are large macules of lighter colour, which on pricking with a pin does not feel pain or the pain is less than elsewhere normal skin.
- Leg Ulcers : If over the leg or foot or ankle there is an ulcer that does not heal— think of chronic leg ulcers.
- Eczema : If there are large macules and small papules in the lower limb or elsewhere that is full of weeping vesicles, with lot of itching and scaling of skin; then consider eczema. This may also present with impetigo.
- Psoriasis : extensive plaques covered by loosely adherent silvery scales

Other common skin disorders are the dry scaly skin of malnutrition and hypothyroidism.

2.1. IMPETIGO OR PYODERMA

This is an infection of skin by bacteria. It affects those who because of water scarcity or other problems bathe less and live in crowded spaces. It spreads easily especially amongst children. It commonly occurs in patients with lice or scabies or tinea infection.

Clinical Presentation

- Multiple pustules with crusts, accompanied by scratch marks.
- Sometimes bullous lesions in children.
- Sometimes lesions are superficial with surrounding redness. Sometimes deep.

Management

Explain planned treatment to mother and child.

Cut fingernails, wash child daily with soap.

Clean lesions with disinfectant - chlorhexidine.

Pierce vesicles,
incise and drain pus,
remove crusts.

Apply gentian violet solution twice daily.

Never put an occlusive dressing with adhesive tape.

Look for lice, scabies or ringworm and if present treat for the same. If it is present on the scalp, shave head before treatment for more effectiveness.

Avoid antibiotics unless there is a spreading redness or increasing pus or fever develops. If any of the above three signs are there add a five to seven day course of antibiotics.

- In antibiotics though penicillin is effective.
- First choice may be cloxacillin.
- Amoxicillin can be used too with Clavulanate.
- Cotrimoxazole is less effective but that too can be tried if the above three

drugs are not available.

- Ertromicin, Cephalosporin group of drugs also effective.

2.2. SCABIES

This is an infection of the skin caused by a small insect mite. It occurs commonly where there is a lack of water, overcrowding or poor hygiene.

Clinical Presentation :

- Itching more at night.
- On examination one can see scratch marks and small papules between and on the fingers and toes. Also seen in genital area, armpits and under folds of skin.
- Often whole family has got signs of infestation.

Management :

Wash the whole body with soap and water.

Then apply gamma BHC solution or Permethrin 5% to the whole body – except for face. Do not apply near or into orifices. Allow to dry on skin. Wash after 12 hours. Repeat after a week 5% Permethrin is preferred than gamma BHC.

If there is impetigo in addition to scabies treat that first and then only treat scabies. Treat the whole family at a time. After the treatment wash all clothes and bedding in boiling water and dry in sun.

PEDICULOSIS:-

Pediculosis is caused by blood sucking ectoparasite on human skin or scalp hair.

TRANSMISSION:- Spread by head to head contact and through shared combs.

TREATMENT:-

Permethrin 1%

Gamma-benzene hexachloride (GBHC), effective against nits, larve and adults

Malathion 0.5%

PYODERMA:-

Pyoderma is predominantly caused by *Staph aureus* or *Strep pyogens*.

TYPES:- Impetigo Contagiosa, Bullous Impetigo, Ecthyma, Furuncles, Carbuncles, Cellulitis, Folliculitis.

TREATMENT:-

Localized infections treated with topical antibiotics like Sodium Fusidate, Mupirocin, Ensamycin, if extensive systemic, antibiotics like Amoxicillin-Clavulinate, Flucloxacillin, Cephalosporin, Erythromycin, etc.

For Folliculitis rest and elevation of affected limb with systemic antibiotics.

2.3. HERPES SIMPLEX INFECTION

This is Viral infection of the skin.

Clinical Presentation

- A number of vesicles that come suddenly. Commonly they are seen around the mouth or even within it when the person is having high fever due to pneumonia or other cause.
- Sometimes it affects the eyes causing redness, watering and decreased vision. This needs to be seen by an eye specialist.

Management

Clean the lesions with chlorhexidine - 4 to 6 times a day.

If pus or spreading surrounding redness develops treat as suggested for impetigo. If it affects the eye acyclovir drops are indicated- but this is better prescribed by eye specialist.

2.4. HERPES ZOSTER INFECTION

This is another viral infection of the skin caused by the same virus that causes chicken pox. Usually the affected person has had chicken pox before. Persons especially children who have not had chicken pox can catch it from such patients.

Clinical Presentation

- A number of vesicles that come suddenly. Commonly they appear in a line along a nerve – on the face, on the chest, on the back or on a limb.

- There is very severe pain that comes with these vesicles. It may start one or two days before and last months after the vesicles have healed.
- Sometimes it affects the eyes causing redness, watering and decreased vision. This needs to be seen by an eye specialist.

Management

Treatment as for herpes simplex but also add paracetamol for pain relief. If pain is severe can be referred to tertiary care centre for pain relief. Acyclovir started at once is believed to reduce duration & severity but in view of cost little effectiveness in most it need not be insisted on.

2.5. URTICARIA

This is an allergic reaction of the skin. One needs to find out what the person was allergic to and remove it now and avoid it later.

Clinical Presentation

- The lesion start over minutes; Many papules form that may change shape and size over hours; It is always itchy; The insect bite can often be seen as a small dark dot on the popular area.
- Rarely there may be an associated difficulty in breathing. If this develops it is an emergency

Management

Give a tablet of chlorpheniramine at once. This tablet may have to be repeated every twelve hours till the urticaria has become less. Usually one dose is enough. Cetrizine once daily also gives good result.

If the offending allergen is identified and avoided no further treatment is required.

But often this is difficult.

If breathlessness develops best to give an injection of 1 ml of 1:1000 adrenaline, and of hydrocortisone 100 mg IV.

2.6. YAWS

This is an infection of the skin and bones that is spread by flies. More in forest areas.

Clinical Presentation

- Presents with an ulcer on the skin with small surrounding ulcers and frambesiomias- small crinkled swellings.
- It can affect mucous membranes as well.
- It can cause chronic lesions on bones usually in the limbs.

Management

Benzathine penicillin

Children : 50,000 to 100000 IU in single injection. Adults : 1.2 MIU in a single injection.

2.7. CANDIDIASIS

2.7.1 PARONYCHIAL LESIONS

Diagnostic features

- Common in people who do wet work
- Commonly affects the posterior nail folds more than lateral folds
- Nail fold shows erythema, boggy swelling, and occasionally discharge of pus on pressing
- Nail may show ridging and become discoloured
- Gram stain of pus shows gram-positive oval shaped budding yeast cells

Treatment

Clotrimazole (1%) lotion to nail folds b.i.d. for 4 to 6 weeks

General Guidelines

To stop all wet work

Use of cotton gloves

2.7.2 INTERTRIGINOUS LESIONS

- Occur over infra-mammary, axillary, groin, perianal or interdigital areas.

Diagnostic features

- Present as moist, red macerated lesions with well defined peeled borders (overhanging scales/surrounded by satellite papules or pustules)

Treatment

Clotrimazole dusting powder

General Guidelines

- Eliminate conditions leading to moisture and maceration
- Expose the areas for drying up of the lesions and avoid tight clothes Wear loose cotton clothes
- If lesions are inflammatory, tepid water compresses 3 to 4 times a day help to cool and soothe

2.7.3 THRUSH/PERLECHE

Diagnostic features

- Whitish plaques loosely attached to oral or vaginal mucosal membranes. On removal, the underlying mucosa is bright red and moist.

Treatment

Clotrimazole mouth paint 2 to 3 times/day for 2 weeks, if it persists (usually there is association with oesophageal candidiasis)

Tab. Fluconazole (200 mg) one tablet on day 1.

followed by Tab. Fluconazole (100 mg) one tablet per day for 14 days.

2.7.4 VULVOVAGINITIS

Diagnostic features

- Vulva shows erythema and oedema with severe itching and vaginal discharge
- Scraping of lesions KOH mount shows presence of fungal forms especially on mucous membranes, but usually not seen with infection on skin.
- Cultures show growth of *Candida albicans* within 48 to 72 hours

Treatment

Clotrimazole vaginal tablet (100 mg) one tablet at bedtime for 7 days

Recurrent vulvovaginal candidiasis

Tab. Fluconazole (200 mg) one tablet as single dose.

Tab. Ketoconazole (200 mg) 2 tablet per day for 2 weeks at bed time half an hour before dinner. Ketoconazole is used to decrease the recurrence rate.

General Guidelines

- To wear cotton underwear and avoid tight clothes.

2.8. DRUG ERUPTIONS

Diagnostic features

- Due to injected, ingested, inhaled, instilled or applied drug.
- The chemical either can be a formulation or in processed foods or milk.
- Manifestation may be immediate (within one hour) accelerated (1-72 hours) late (>2 days)
- Lesions may be exanthematous, macular, urticarial, petechial, purpuric, bullous, erosions, exfoliative or erythematous plaques

Treatment

Tab. Chlorpheniramine (4 mg) one tablet t.i.d. or Tab. Cetrizine(10mg) And Calamine lotion to be applied locally

If severe,

Tab. Prednisolone (20 mg) (maximum of 40-60 mg) per day in divided doses for 2 weeks.

General Guidelines

- If due to a drug, try to pinpoint the drug to stop its use
- Suspect recently started drugs or those, which are statistically more common offenders

2.9. ECZEMA/DERMATITIS

- These are synonymous terms signifying inflammatory response of skin to different factors.
- Caused by exogenous or endogenous factors
- Generally, 3 stages - acute, subacute and chronic
- Acute stage - characterised by erythema, oedema, vesicles and oozing.
- Subacute stage - erythema, oedema, vesicles decrease and are replaced by moderate oozing, crusting & scaling
- Chronic stage - mainly consists of pigmentation and lichenification.
- Highly pruritic in all stages.

General Guidelines

- Avoid exposure to trigger or precipitating factors where applicable. Management includes establishing the cause of dermatitis by patch testing and removing the contactant if possible. common contactants are synthetic fabric plastic chromium plating etc.
- Good personal hygiene to avoid introducing an infection.

Treatment

Treatment It is according to stage of dermatitis.

Infected eczema

Emollients e.g. aqueous cream applied daily

1. Mild cases: Hydrocortisone 1% ointment daily
2. Moderate cases: Betamethasone 0.1% cream or ointment daily
3. Severe cases: Systemic antibiotics, e.g.
 Cap. Amoxicillin (250 mg) 8th hourly for 5 days
 Or
 For Penicillin - allergic patients
 Tab Erythromycin strearate (500 mg) t.i.d. for 5 days

Wet dressings with light weak pink Potassium Permanganate soaks for 5 days where indicated.

Symptomatic relief by Antihistamines, e.g.

1. Tab. Chlorpheniramine (4 mg.) t.i.d. as needed or Tab. Cetirizine (10mg) once daily.
 2. Tab. Promethazine (10-25 mg) 6th - 8th hourly, as needed, in severe cases
- Refer to higher centre to confirm diagnosis, and for management of complicated cases.

Acute eczemas

Mild or Moderate	Severe
<ul style="list-style-type: none"> ● Soaks or compresses of plain tepid water OR normal saline 	<ul style="list-style-type: none"> ● Tab Prednisolone (5 or 10 mg) 0.5- 1 mg/kg with gradual tapering of

If Infection Present

- Condy 's lotion (1:8000 Potassium Permanganate) 3-4 times per day till oozi-
ng stops.
- Tab. Erythromycin (250 to 500 mg)one tablet q.i.d. for 5 days
- Tab. Chlorpheniramine Male-
ate (4 mg) one tablet t.i.d.
for 5 to 10 days

Subacute eczemas

Zinc Oxide cream or paste, applied on gauze piece, which is then applied to the skin and dressed

Or

Calamine lotion

Plus if infection present.

Tab. Erythromycin (250 or 500 mg) one tablet q.i.d. for 5 days.

Tab. Chlorpheniramine Maleate (4 mg) one tablet q.i.d. for 5 to 10 days.

Chronic eczemas

- Tab. Chlorpheniramine (4 mg) one tablet t.i.d. for 10 days

For children and facial lesions

- Hydrocortisone (2.5%) cream two or three times a day or Betamethasone 0.1% cream

For adult and for lichenified lesions

- Clobetasol Propionate (0.05%) cream once a day
- Plus
- If infection present antibiotics as for infected eczema

2.9.1. SEBORRHOEIC DERMATITIS

Diagnostic features

- Chronic greasy scaling and erythema of scalp, naso-labial folds, retro-

auricular folds, axillae or groins

Treatment

Miconazole cream (2%) apply locally b.i.d. for 3 weeks

Topical steroid lotion - Betamethasone Dipropionate (0.05-.1%) once or twice daily for 3 weeks.

General Guidelines

- Review patient after 3 weeks

2.9.2 NUMMULAR DERMATITIS

Diagnostic features

- Coin shapes, well-circumscribed plaques of eczema over dorsa of hands, forearms, legs or other areas of body.

Treatment

Tab. Chlorpheniramine (4 mg) one tablet t.i.d. for 5 days

And

For acute stage-exudative phase

Compresses with potassium Permanganate solution (1 to 5000 parts of water) locally over oozing lesions or Calamine lotion.

For Subacute & chronic stage

Betamethasone Dipropionate cream (0.05%) topically for 2 weeks

Or

Betamethasone Dipropionate cream (0.05%) with Gentamycin for 2 weeks locally if bacterial superinfection is suspected.

And

Inj. steroids intralesionally 0.1 0.3 ml in each site in very thick lesions

General Guidelines

- Avoid dryness of skin
- Review patient after 2 Weeks

If improvement is not seen; refer the patient to dermatologist.

2.9.3. ATOPIC DERMATITIS

Diagnostic features

- Chronic pruritic dermatitis, over face, neck and flexures

Treatment Guidelines

Control pruritus with Tab. Chlorpheniramine (4 mg) one tablet t.i.d. for 3 days
Fluticasone Cream Clobetasone Butyrate cream (0.05%) topically for 2 weeks.

General Guidelines

- Soft non-irritating clothing
- Use of emollients
- Avoiding aggravating food item like eggs, Cowmilk, meat, etc.
- Avoid irritating strong soaps or chemicals
- Exclusive breast-feeding in infants.
- Review patient after 2 weeks.

2.10. FUNGAL INFECTIONS/RINGWORM

2.10.1 TINEA VERSICOLOR

This is fungal infection of the skin.

Diagnostic features

- Superficial scaly hypopigmented macules often large and irregular, occurring on face neck, trunk or limbs.

Treatment

Miconazole cream 2%
or
topical clotrimazole 1% Cream
twice a day for a few weeks
Tab. Fluconazole 400mg - single dose.

2.10.2 RING WORM (TINEA CRURIS, CAPITIS, UNGUM)

Diagnostic features

- Non-hairy skin : lesions starts as erythematous macules, spread peripher

ally and develop into arciform or annular lesions, margin active, erythematous, vesicular and scaly, while centre heat showing scaling & discoloration.

- Hairy skin; scalp or beard shows patchy hair loss and underlying skin shows broken stumps, erythema, scaling or pustulation
- Nail infection manifests with nails becoming brittle, friable, thickened and later eaten up.

Drug Treatment

Miconazole cream (2%) Or

Clotrimazole cream (1%) locally twice a day

And

In extensive, recurrent or steroid treated infections

Tablet Fluconazole 200 to 400 mg or 6 mg/kg weekly for 6 to 8 weeks

Refer to higher centre if no response

2.11. PSORIASIS

Psoriasis is a papulo-squamous disorder

Diagnostic features

- Erythematous, sharply marginated plaques covered by loose adherent, silvery scales, which on removal may show pinpoint bleeding.
- Classical sites of involvement are the bony areas and pressure sites, along with the extensors. Nails may show pitting.
- If lesions can occur - pustular psoriasis
- Joint involvement of psoriasis is called psoriatic arthropathy affecting the distal inter phalangeal joints, and large joints along with spondyloarthritis

General Guidelines

- Counselling with regards to precipitating factors.
- Avoid stress, sunlight, drugs like NSAIDs, Chloroquine and Lithium, and infections.

Drug Treatment

TOPICAL

Local plaques :

Salicylic Acid (3%) in white soft Paraffin t.i.d. Or

Dithranol (0.1 - 1.0%) In soft Paraffin (occasionally up to 5%) daily for 0.5 - 1 hour prior to a bath

Or

Coal tar, 2-6% plus Salicylic Acid 2% combination, in soft Paraffin for the body or in an emulsifying ointment for the face.

Severe localised pustular psoriasis .

Topical steroids e.g. Hydrocortisone, 1% for the face. Apply sparingly once daily

And

Betamethasone Dipropionate 0.1% diluted in aqueous cream to make a 1:10 or 1:5 concentration. Apply twice daily (for palms and soles)

Salicylic acid and coaltar preparation are irritant - avoid contact with eyes, tender areas or open wounds

Systemic -

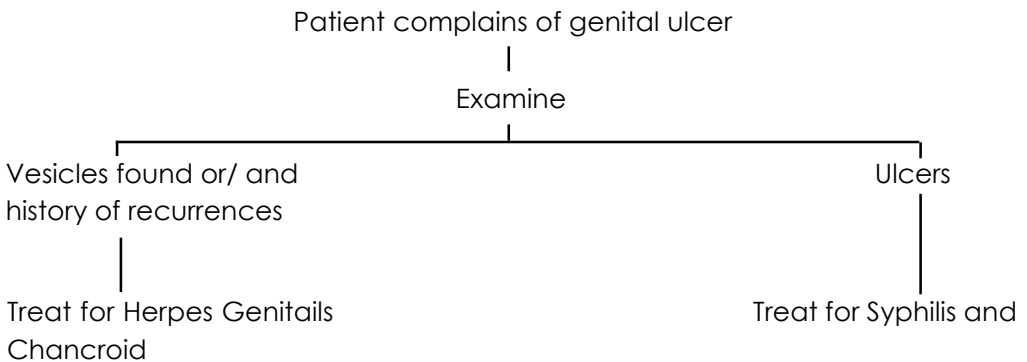
-Systemic puva sol, Narrow band UVB, Methotrexate, cyclosporin acitretin.

Refer if

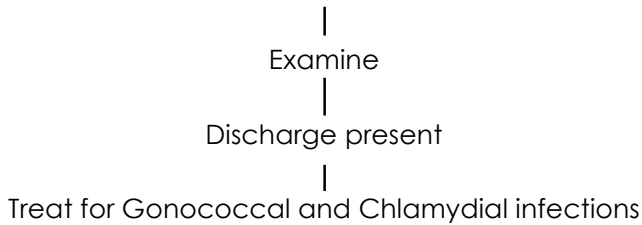
- No response to treatment
- Uncertain diagnosis
- Severe psoriasis and complications

SEXUALLY TRANSMITTED INFECTIONS

STIs are most frequently transmitted through sexual route and less frequently through blood transfusion and transplacentally.



Patient complains of urethral discharge

**DRUGS USED:-**

Inj. Benzathene Penicillin 2.4 megaunits deep intramuscular (half in each buttock) for early Syphilis (<2 years). 2.4 megaunits deep intramuscular weekly for 3 consecutive weeks (>2 years) for Syphilis ulcer after skin sensitivity test (AST)
 For Chancroid Azithromycin (1 mg) single dose or inj. Ceftriaxone 250 mg im stat or tabs. Ciprofloxacin 1mg for 3 consecutive days.
 For Genital Herpes tabs. Acyclovir 400mg thrice daily for 5-7 days.
 For Gonococcal and Chlamydial infection Cefixime 400 mg single dose with tabs. Azithromycin 1mg single dose.

FUNGAL INFECTION

Fungal infections of skin can be superficial or deep

CLINICAL COMPONENT:- Typical lesion is an itchy annular/arcuate polycyclic plaque with central clearing and peripheral spreading papulo-pustular margins.

TYPES:-

- Tinea Capitis (Scalp)
- Tinea Corporis (Body)
- Tinea Cruris(Groin)

DIAGNOSIS:-

- Morphology of lesions
- KOH mount for fungal hyphae

TREATMENT:-

Topical therapy with Miconazole, Clotrimazole for localized infection
 Extensive skin lesions with oral terbinafine, griseofulvin or itraconazole

ECZEMA

Eczema is a reaction pattern where skin is boiling out or oozing out.

CLINICAL COMPONENT:- Eczema manifests as pruritus, erythema, edema, papules, vesicles, scaling and lichenification.

Acute Eczema is exudative and chronic eczema is dry, scaly and lichenified.
 Serum IgE is often raised

TREATMENT:-

- Multipronged approach
- To avoid triggers like woolens and excessive degreasing
- Topical moisturizers
- Topical steroids and histamines if required

Chapter V

ODONTOLOGY (Dentistry)



Introduction:

Dentistry is the science and art concerned with the anatomy, physiology and pathology of the Oro-facial complex and with the prevention, diagnosis and treatment of that region.

Majority of our population suffer from dental diseases for which we are far behind from total health. The importance of dental health with regard to general health is well established and a proved factor. Dental diseases are mainly due to delay in diagnosis and treatment. If diagnosed early, dental diseases can easily be prevented. There is an urgent need to prevent the rising trend of dental diseases in our State. A major part of our population lives in rural and hilly areas. To render Dental services to our population, Dental Surgeons are appointed at different level Hospitals – P.H.C.s Rural Sub-divisional Hospital, District Hospitals, State Hospitals. Most of the Dental Surgeons are clustered in town areas. Not all the PHCs are covered with Dental Surgeons; if at all provided with dental Surgeon, most of them lack in proper infrastructure.

The method used for Primary prevention of dental diseases aims at achieving primary prevention of dental caries Periodontal diseases and Oral Cancers. For the last few years great emphasis has been given to the school children for, Dental Health check up both by the Government and organizations like Indian Dental Association, Lion's Club, Rotary Club etc. Similar measures for prevention of Oral pre-cancer and cancer has also been taken up and it has been highlighted that use of tobacco in any form or chewing of Pan masala can induce irreversible damage in the oral cavity which in turn may lead to oral pre-cancer and cancer.

In Tripura, the introduction of a Standard treatment Protocol State wise is definitely needed. The treatment facilities at different level of health care delivery system will be different depending on the availability of specialist and infrastructure. The role of Dental Surgeon at PHC level is more important at prevention point of view.

Salient features of Standard treatment Protocol in Dentistry:

1. Proper and thorough examination of the oral cavity using bright light, mouth mirror, dental probe, tweezers.
2. Examination of teeth for dental caries, fractured teeth, enamel hypoplasia, extrinsic and intrinsic stains, number of teeth, any visible swelling around the teeth or impacted teeth.
3. Examination of oral mucosa and tongue for any change in color, lesions or any ulceration.
4. Gum around the teeth should be checked for any unusual bleeding or

swelling.

5. Examination of Maxilla and mandible for any bony swelling.

6. Examination of T.M. joint.

7. Examination of submandibular (Neck) lymph nodes.

Treatment:

There is no scope of providing treatment of all the branches of dentistry at Sub-division or PHC level due to lack of infrastructure and manpower.

Awareness of the patients should be done at this level for prevention of diseases rather than giving emphasis on curative aspect.

Treatment of dental caries includes restoration of decayed teeth, endodontic procedures to preserve the tooth or extraction of teeth depending upon the progress of the diseases.

Treatment of Periodontal diseases includes

- i. Awareness and dental education of the patient for improvement of Oral hygiene and maintenance.
- ii. Oral prophylaxis or scaling – dental Surgeon alone cannot do this job to the vast population. Here the role of hygienist is very important but unfortunately the number of hygienist is nil in our State.

Treatment of mal-aligned teeth or fabrication of dentures may not be possible at Sub-division or PHC level due to lack of infrastructure and so be referred to higher centers.

Treatment of Oral Pre-cancer and cancer includes identification of the lesion at a very early stage, awareing the patient about the predisposing factors and motivating the patient to quit them. Then patient should be referred to special referral hospital for further investigation and treatment.

Requirements in P.H.C. level dental clinic:

Non-pharmacological:

- i. Cotton
- ii. Gauze
- iii. Gloves

- iv. Disinfectants
- v. Disposable Syringes
- vi. Zinc oxide powder and liquid eugenol
- vii. Silver alloy powder and mercury
- viii. Glass ionomer cement
- ix. Composite resins
- x. Materials for R.C.T.
- xi. S.S. wire for inter-maxillary fixation

Pharmacological:

- i. Local anesthesia
- ii. Analgesics
- iii. Antibiotics
- iv. Life saving drugs

Indications for referral to higher centers:

- i. For investigation like O.P.G. X-ray, CT Scan, MRI etc.
- ii. Biochemical tests
- iii. For treatment of extensive lesions of the Jaw, Unfavorable fractures, patients suffering from hematological disorders, Road Traffic injuries causing gross mutilation of face, for specialized dental treatment procedures.

Patients with suspected cancerous lesion must be referred to specific centers for further investigation and specific treatment.

Patient education dialogue:

Knowledge about dental diseases and their prevention can help a large population to a great extent. This can be done using i. mass media, ii. Community health check up programme, iii. School health check up programme, iv. through leaflets and hoarding.

Dental Surgeons posted in different centers can play a very important role in this regard.

List of equipment and duties of a Dental Surgeon in P.H.C and Sub-division level:

Equipments:

- i. Dental chair with unit and light.
- ii. Electric sterilizer
- iii. Instrument trolley and table
- iv. Forceps for dental extraction
- v. Scaling set
- vi. Instrument used for restoration

vii. Surgical instrument for minor surgeries.

Routine work:

- i. Routine extraction of teeth
- ii. Oral prophylaxis
- iii. Restoration of decayed teeth
- iv. Diagnosis of Oral diseases
- v. Referring the patients to higher centers for specific treatment.

Treatment of Dental diseases expected from a Medical Officer in P.H.C. where there is no Dental Surgeon:

Due to shortage in number it may not be possible to appoint dental Surgeon in all P.H.Cs. In such cases, Medical Officers posted there can play an important role to give immediate relief to the patients suffering from dental diseases.

Dental Pain:

- i. Due to dental caries – Prescribe analgesic, apply local anodyne like clove oil, antibiotics like Amoxycillin.
- ii. Due to Periodontal diseases – Prescribe Amoxycillin + Metronidazole in usual dose, Recommend tooth brushing.

Bleeding Gum:

Bleeding gum with poor oral hygiene, bad breath, swollen gum may be due to Periodontal diseases. Primary treatment may be followed in same as dental pain due to Periodontal diseases.

Bleeding gum with marginal gingival ulceration and fever in children may be due to ANUG (acute Necrotising Ulceration Gingivitis). Treatment should be combination of antibiotic like amoxicillin and metronidazole in prescribed dose along with mouthwash of oxidizing agent like Hydrogene Peroxide.

In all cases, after controlling the primary complaints patients should be referred to Dental Surgeons for specific treatment, as because, spontaneous bleeding gum in spite of good oral hygiene may be due to some systemic diseases. Specific investigation and treatment should be done in such cases.

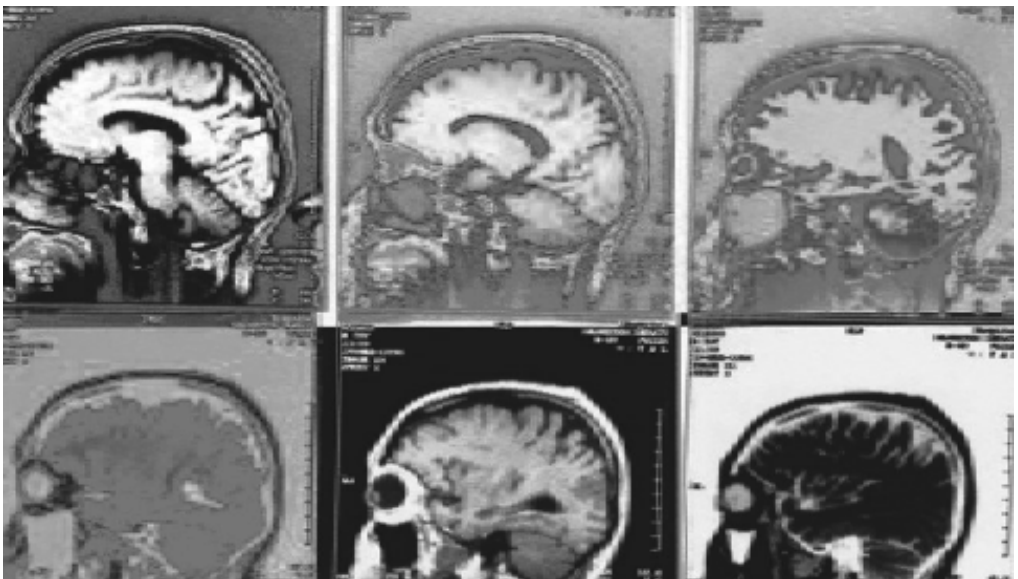
Ulcer present in Oral Cavity:

It may be a benign ulcer or a malignant ulcer. Therefore, through examination of the lesion should be made and differential diagnosis should be brought in mind. If any doubt points towards malignancy patient should immediately be referred to specific centre for specific treatment.

Chapter VI

PSYCHIATRY

(PRIMARY CARE IN MENTAL ILLNESS)



ABBREVIATION

ADHD - Attention Deficit Hyperactive Disorder

AIDS - Acquired Immune Deficiency Syndrome

BD - Twice daily

CT - Computed Tomography

CVA - Cerebro Vascular Accidents

DSM - Diagnostic and Statistical Manual

EEG - Electro encephalography

GI - Gastro Intestinal

HIV - Human Immuno Deficiency Virus

ICD - International Classification of Diseases

IHD - Ischemic Heart Disease

IM - Intramuscular

MRI - Magnetic Resonance Imaging

NMDA - N Methyl D Aspartate

NSAID - Non Steroidal Anti Inflammatory Drug

OD - Once Daily

QDS - Four Times Daily

SLE - Systemic Lupus Erythematosus

SOL - Space Occupying Lesion

SR - Slow Release

SSRI - Selective Serotonin Reuptake Inhibitor

GENERAL OUTLINE TO PSYCHIATRIC DISORDER

Mental health and mental disorder are not just simply associated with the pathological counterpart of a normal psychological self as we commonly encounter in case of a physical disorder. It is rather in continuum and when grossly interferes with the personal and interpersonal activities, we assign a diagnostic name for it.

Till the middle of twentieth century philosophical, social and psychological mode of explanation are given to the deviant behaviour or state that dominated the world of mental disorder. Though brain as the seat of mind is accepted unanimously but we are still far from reducing the mental functions to neuropsychological modules.

The advent of antipsychotics along with developments in molecular biology and neuroimaging started changing the psychological biases towards the organic frame.

Psychiatric disorders:

1. Schizophrenia and other psychotic disorders.
2. Mood disorders:
 - Major depressive disorder
 - Bipolar disorder
3. Anxiety disorders:
 - Generalized anxiety disorder
 - Panic disorder
 - Phobic disorder
 - Obsessive-compulsive disorder.
4. Other neurotic disorder:
 - Hypochondriasis
 - Conversion disorders
 - Somatoform disorders
5. Organic brain disorders:
 - Dementia
 - Delirium
 - Psychiatric problems associated with other disorders e.g.: AIDS, Epi-

lepsy, Parkinson's disease etc.

6. Substance abuse disorders:

- Alcohol
- Cannabis
- Nicotine
- Opioids

7. Psychiatric disorders of childhood:

- ADHD
- Autism
- Mental retardation

With this background the treatment guidelines of some important psychiatric disorders are being presented.

PRIMARY CARE IN MENTAL ILLNESS

Mental illness is common in the community. Often it is not recognised. Often, even if recognized, it is not seen as something for which medical help is to be sought. Hence health care providers may have to detect this in the families when they visit them, or during school health programme or during health camps or when they present to medical officers with various physical complaints. At times, relatives or patients themselves come to medical officers with complaints and since there are few psychiatrists available, we would need to manage them. If there is a Psychiatrist accessible, at least one consultation to establish diagnosis and start drugs is advisable.

Mental illness may be recognised by the following :

- Talking nonsense and acting in a strange manner considered abnormal.
- Becoming very quiet and not talking or mixing with people.
- Claiming to hear voices or see things others cannot hear or see.
- Becoming very suspicious and claiming that some people are trying to harm them.
- Becoming unusually cheerful, cracking inappropriate jokes and saying that they are very wealthy and superior to others when it is not really so.
- Becoming very sad and crying without reason.
- Talking of suicide or having attempted it.
- Getting possessed by god or spirit and being said to have become victim of black magic.
- "Dull" and not mentally grown up like others of their age and slow development since birth.

Further we would, on enquiring, find that they may have:

- Sleep disturbance
- Poor appetite and very irregular food intake
- Not doing any work
- Not being able to maintain personal hygiene
- Disturbed relationship with family members and others
- Exhibiting behaviour that is harmful to themselves or others- suicidal; abusive, assaultive, homicidal.
- Exhibiting socially unacceptable or inappropriate behaviour- undressing in public, collecting rubbish, wandering away from home.

Whenever we find a person with mental illness we should discuss it with the family. Often they have not so identified it and may be calling it evil eye or/are just angry with the person for misbehaviour or have quietly ignored her.

When dealing with mental illness remember :

- That family members make the decision.
- That a male health care provider never examines or talks to female patient alone- always keep another woman or the husband with you. (This is true for all medical examination of women)
- Do not blame or criticise anyone as a cause for the illness, nor encourage them to do so.
- Reassure them but do not over promise on what you or anyone else can do for the patient.

Follow up of the patient :

After the diagnosis has been established preferably at a specialist centre the primary health care centre should provide regular follow up and adjustment of drug dosage.

If no psychiatry specialist is available, a physician is the next choice. Where neither is available even diagnosis can be made by a basic medical officer.

- Check whether patient is taking medicines regularly.
- How much improvement has been made. Is it enough to going to start work again.
- Has any side effect developed with drugs.
- Whether they have gone to see the specialist as scheduled.

DEPRESSION

AT P.H.C. LEVEL

The most common mental disorders encountered by a primary care physician

is depressive disorders.

Following facts are of significance:

- Grossly under diagnosed in primary care – 50% of depression is missed.
- Grossly under treated.
- Leading cause of disability as assessed by DALY-presently 4th in the rank and in 2020 projected to be 2nd only behind IHD.
- High prevalence.
- Responsible for 2-5 times increased absence from work.
- 26 times increased risk of suicide. 15% of depressed patients commit suicide.
- Many systemic disorders like hypothyroidism, intracranial SOL, SLE etc can present with depression.
- Many patients with depression present with somatic symptoms and pain-which are very common in primary care.
- Depression is a term that is often misquoted and misunderstood. Feeling depressed is not sufficient to diagnose depression. To diagnose depression as a disorder one should fulfill the diagnostic criteria of depression.

The symptoms are:

Category I.

- Depressed mood.
- Loss of interest and enjoyment
- Fatigability

Category II.

- Reduced concentration and attention.
- Reduced self-esteem and self-confidence.
- Ideas of guilt and unworthiness
- Bleak and pessimistic view of future.
- Ideas and acts self harm
- Disturbed sleep
- Diminished appetite

To fulfill the criteria one must have at least 2 of the symptoms from category 1 and two from category II and they should be present for at least 2 weeks and having some impact on his daily activities.

Certain issues require special consideration:-

A. General medical conditions and depression

Sometimes depression may be the manifestation of some underlying general medical condition. It may be associated with other features of the disease but sometimes depression may be the only presenting complaint. Therefore one should exclude specific underlying medical condition when coming across with depression.

Some common medical conditions which may present with depression is given below:

- Hypothyroidism
- SLE
- Malignancy e.g. Ca. Pancreas
- Parkinsonism/Epilepsy/CVA
- Substance abuse-Alcohol, Opiates
- HIV/AIDS

B. Depression and Somatization:

By definition Somatization is somatic complaints for which adequate medical explanation is not found and patients seek medical help for their complaints. It can be a part of depression that often missed due to lack of proper awareness. They may be a) Physical aches and pain, b) dizziness, c) breathing problems, d) G.I. Symptoms etc.

C. Depression and old age:

Depression is very common in old age and is often judged as a natural accompaniment, which is not true and it is very much treatable. Old people who are suffering from depression often complain of memory problems, hypochondriacal symptoms, loss of weight and sleep disturbances. Depression with memory problems needs to be differentiated from dementia.

D. Depression and suicide:

Suicide is the most ominous risk of depression and one should always assess suicidal risk while dealing with a depressed patient. The most important risk factors are as follows:

- Prior suicidal attempts (important point – to look for final act e.g. suicidal notes or making of will
- Family history of suicide.
- Hopelessness
- Substance abuse
- Poor social support.
- Accessibility of suicidal means.

One should ask all depressed patients

- Thoughts of deaths hurting self
- Prior suicidal attempts
- Suicidal contemplation and plan.

It is a misconception that asking about suicide increases the risk of suicide by pushing the thought into one's mind.

General Guidelines

- Take time to talk to the patient. Often there are immediate causes for the depression but the extent of depression is out of proportion to the known causes. Counsel him/her to understand that he or she needs help.
- Persuade him to eat something.

When to refer:

Depression is a disorder that should be treated by primary care physicians but certain conditions herald specialist intervention.

They are as follows:

- Suicidal patients
- Depression with history of manic episode
- Treatment resistant depression
- Depression with psychotic features
- Recurrent depressive disorders.

Treatment:

In primary care setting pharmacotherapy is the main stay of treatment but with additional training in psychotherapy it can be more beneficial.

Selective serotonin reuptake Inhibitor (SSRI) should be the first choice for dosage convenience and better side effect profile. One should keep in mind that there is a latent period of 3-6 weeks before the drug has its onset of action and this should be conveyed to the response. Discontinuation should be done over a period of several weeks with gradual tapering of the dosage.

Among the SSRIs Fluoxetine 20-40mg/day, Sertraline 50-100mg/day and Escitalopram 10-20 mg/day are mainly used. Escitalopram and Sertraline have the least possibility of drug interaction and are preferred on a patient getting multiple drugs. The most important side effect of SSRI are GI disturbance and sexual side effects, both of which can be minimized by addition of a small dose of Mirtazapine 7.5mg at night. The patient with multiple episodes, medical co-

morbidity and having subsyndromal depression features while on treatment, will probably require longer treatment.

Tricyclic antidepressants like amitriptyline, doxepin and imipramine are some of the older types of antidepressants which are useful but due to anticholinergic and cardiac side effects these drugs are now used as second line of treatment.

AT C.H.C./RURAL HEALTH CENTRE LEVEL

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MANIA

AT P.H.C. LEVEL

Common signs and symptoms of mania include:

- Feeling unusually "high" and optimistic OR extremely irritable
- Unrealistic, grandiose beliefs about one's abilities or powers
- Sleeping very little, but feeling extremely energetic
- Talking so rapidly that others can't keep up
- Racing thoughts; jumping quickly from one idea to the next
- Highly distractible, unable to concentrate
- Impaired judgment and impulsiveness
- Acting recklessly without thinking about the consequences
- Delusions and hallucinations (in severe cases)

Treatment List for Mania

- Tranquillizers- Inj. Haloperidol (5mg), Inj. Promethazine (50mg) in combination with or without Inj. Lorazepam (4mg) may be used. It could be repeated after one hour.
- Sodium Valproate – 500 to 1500mg/day in divided doses.
- Lithium carbonate – 600 to 900mg/day in two divided doses.
- Carbamazepine – 25mg/kg body weight in divided doses

When to refer:-

Acute mania is disruptive and agitated needing hospitalization. So after sedating the patient should be referred to the nearest hospital where there are Psychiatrist and admission facilities.

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SCHIZOPHRENIA

AT P.H.C. LEVEL

It is a severe brain disorder with structural changes in different parts of the brain producing gross dysfunction in the areas of thought, emotion and behaviour which acts in a coordinated manner gets broken so that a person afflicted with schizophrenia behaves in different manner against a thought and which evokes a different feeling compared to a normal person. For example a person may say that he is like the king but at the same time begging alms. It is actually a syndrome having heterogeneous entity with variability in presentation. Treatment and outcome. There is no confirmatory investigation and diagnosis is dependant on the basis of skilled history taking and mental status examination following a reliable diagnostic criteria. However following symptoms should always arouse suspicion.

● Delusion, which means a false belief which cannot be corrected by giving evidence to contrary and which is not shared by people of the same social and cultural background. One common delusion is delusion of persecution where the person believes that he will be harmed when there is no such thing in reality.

● Hallucination which means false perception in the absence of adequate stimulus. The people hear voices in the absence of actual voices or see some thing when there is nothing. The hallucination can occur in any of the five sensory modalities e.g. auditory, visual, olfactory, gustatory or tactile.

- Disorganized speech when the speech may be irrelevant, incoherent or the links are lost while talking.
- Disorganized behaviour, when the person behaves in a very inappropriate manner e.g. suddenly become agitated, laughs without reason or putting a dress which is idiosyncratic.
- Persistent negative symptoms like gross withdrawal/apathy/self neglect.

General Guidelines

- Advise others not to talk or act in way that provokes him further. Keep away individuals whom patient does not like.
- Do not argue or scold the patient.
- Try to gain confidence by asking " what are your problems" "what is troubling you" "Let me try and help" etc.
- When he calms see that he takes some food and fluids.

Treatment:

The treatment of schizophrenia is a specialist job but the following tips may be useful for a primary care physician.

Early and proper treatment of schizophrenia can enable most persons to lead a reasonable normal life.

Treatment includes:

- Medication – in many cases lifelong.
- Psycho-social treatment like family therapy, social skills training, occupational therapy etc.
- Social support from family or community group

Medication of first choice at present day is atypical antipsychotic e.g. Tab. Olanzapine 5-20mg/day, Tab. Risperidone 2-6mg/day
Typical antipsychotics are also used e.g. Haloperidol (5-15mg) but the chances of extra pyramidal symptoms are high with the drug.
Primary care physicians also have a primary responsibility to minimize the social stigma attached with schizophrenia. The main reasons for stigma are perceived incurability, familial nature of the disorder and unpredictability of behaviour.

When to refer

- If he does not calm down and is getting violent.

In the worst situation one can throw a blanket on him and hold him with others help and take to a referral hospital.

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ANXIETY DISORDER

AT P.H.C. LEVEL

Anxiety is a common emotion; everybody comes across it and is a warning signal from evolutionary perspective. It acts as a drive also, as anxiety-performance is an inverted U shaped curve but it becomes a problem when it becomes prolonged, inappropriate and excessive to a situation so that the socio occupational functioning is grossly impaired, then it needs intervention.

Anxiety symptoms can be categorized as follows:

1. Cognitive:-

- Feeling of apprehension.
- Excessive preoccupation with dreadful happening

2. Behavioral-

- Irritability and restlessness
- Disturbed sleep
- Inability to relax

3. Autonomic:-

- Tremor

- Palpitation
- Excessive sweating
- Shortness of breath

The following varieties are of importance to a primary care physician:

A. Obsessive compulsive disorder

Here the person is disturbed by recurrent, intrusive, distressing thoughts, images or impulses not in conformity with one's self image (egodystonic), which are called obsession. Compulsions are repeated stereotype acts or rituals that are being done to relieve the anxiety generated by the obsession. Common obsessive compulsive symptoms are thoughts of contamination (obsession) followed by repeated washing (compulsion), doubt (obsession) followed by checking (compulsion) or blasphemous thoughts about gods and goddesses (obsession) followed by repeated uttering of some mantra or doing repeated pranamas (compulsion).

The mainstay of treatment is:

- SSRI – they are required at higher dose e.g. Fluoxetine – 60 mg-80 mg/ day or Sertraline 150-200mg/ day. The latent period of response is 2-3 months or more.
- Clomipramine – 150-200 mg/day
- Cognitive therapy
- Behaviour therapy

B. Phobic disorder:

The core feature of this group of anxiety disorder is phobia, which defined as inappropriate or excessive fear of an object or situation external to the individual and they are usually avoided to prevent anxiety.

It can be of there types:

Specific phobia - Fear to specific object or situation. E.g. phobia for cockroaches, height, closed spaces etc.

Social phobia - In social or performing situation, producing avoidance.

Agoraphobia- When patient feels that escape is difficult and the therefore avoids the situation as exposure may precipitate severe symptoms. In this case the person can not go out of house alone or feels it very much distressing and some times needs a person to accompany him, called phobic companion.

Treatment:

- SSRI
- Behaviour therapy.

C. Panic disorder:

It is characterized by recurrent, spontaneous panic attacks, (episodic anxiety attacks associated with autonomic symptoms) not restricted to particular situation or object and is unpredictable in nature. However it is to be remembered that panic attack as a symptom can occur in all other anxiety disorder or mood disorders or even in schizophrenia. But in panic disorder this panic attack is the primary symptom. However one should exclude conditions like paroxysmal supraventricular tachycardia, hyperthyroidism, hypoglycaemia, complex partial seizures or in rare cases phaeochromocytoma before diagnosing a panic disorder.

Treatment:

a. Benzodiazepines-

- Alprazolam
- Clonazepam

b. SSRI

c. Cognitive behaviour therapy

D. Generalized anxiety disorder:

Here continuous free-floating anxiety not restricted to any particular situation or object is the main feature. It occurs most of the days for several weeks and not episodic as in panic disorder. The difference with obsessive compulsive disorder is that it usually deals with real life problems.

Treatment:

- SSRI
- Short course of Benzodiazepines like Clonazepam or Alprazolam.
- Behaviour therapy-Relaxation exercise. Pranamas and yogic exercises are some of the indigenous methods which helps profoundly to tackle anxiety

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CONVERSION DISORDER

AT P.H.C. LEVEL

Previously coming under the broad heading 'Hysteria', is one of the important mental disorders encountered by primary care physician. Here pseudoneurological symptoms e.g. deficits or symptoms affecting voluntary motor or sensory function occur, which are thought to be due to underlying psychological stress factor. Common presentations are convulsion, paralysis, loss of sensation; aphonia etc.

Common distinguishing features from true neurological entity are;

- Preservation of reflex functions
- Not conforming to the anatomical structures
- Inconsistency of symptoms.

Pseudoseizure can be distinguished from true seizure:

- It is more prolonged
- Some amount of consciousness is preserved
- No self-injury or incontinence.
- Does not occur in sleep
- Nature is sometimes bizarre

Treatment:

Mainly psychotherapy, anxiolytic drugs in low dose sometimes help.

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SOMATOFORM DISORDER AND HYPOCHONDRIASIS

AT P.H.C. LEVEL

Here somatic symptoms without any underlying explainable pathology form the main presenting complex. In hypochondriasis the person is under the notion that he is suffering from some serious medical disorders. One is not going to miss any underlying pathology. However too much investigations should also be avoided because then it reinforces the problem.

Treatment:

- Psychotherapy along with SSRIs and anxiolytic drugs are used to treat the condition.
- If the hypochondriasis amounts to delusion then antipsychotic drugs are also required.
- A good rapport with the patient is essential and the patient should be dealt cautiously with empathy. One should remain concerned about the negative reaction of the patient if the physician tells the patient "You have no problem, it is only psychological" The patient is really suffering and the above statement means that the patient is malingering. It is better to rephrase the statement "I understand you are suffering a lot but you have no serious medical problem and I will help you to cope with it"

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DEMENTIA

AT P.H.C. LEVEL

Dementia is global decline in cognitive functioning, which is characterized by three main groups of symptoms:

Neuropsychological symptoms:

- Amnesia, aphasia, apraxia and agnosia.
- Neuropsychiatric symptoms (Behaviour and psychological symptoms of dementia.) Depression, sleep disturbance, psychotic features, agitation.
- Loss of activities of daily living.

Treatment:

a) *Pharmacotherapy of cognitive dysfunction:-*

1. Cholinesterase inhibitor: Donepezil 5-10mg/day
Rivastigmine 3-12mg/day
Galantamine 8-24mg/day
2. Memantine (NMDA antagonist) 10-20mg/day

b) *Pharmacotherapy of behavioral problem*

Benzodiazepine and drugs with anticholinergic side effects should be avoided. Olanzapine (5-10mg) and Risperidone (0.5-1.5mg) in low doses are helpful in controlling psychotic problem. (Though recently warnings have been issued of the increased incidence of stroke on these drugs when given to patients of dementia. So better to give these drugs for as short period as possible) Valproate can be used to control agitation. Sedative antidepressants like Trazodone (25mg) and Mirtazapine (7.5mg) can be used to initiate sleep

c) *Non-pharmacological management:-*

- keeping the patient oriented to time, place & person.
- Talking about old memories.
- Keeping physically active.
- Make their own things to do as far as practicable.

d) *Support and psycho education of the caregivers.*

AT C.H.C./RURAL HEALTH CENTRE LEVEL

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AT SUB-DIVISIONAL LEVEL

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ALCOHOL DEPENDENCE**AT P.H.C. LEVEL**

The treatment of alcohol dependence is mainly done in three phases:

1) Intervention-

- F- Feedback. Explaining risks and harms
- L- Listen. Whether the patient is prepared to give up drinking
- A- Advice. Clear advice about cutting down or stopping drinking
- G- Goals. Ultimate aim
- S- Strategies. Practical ways of changing drinking

2) Detoxification:

Process of withdrawing alcohol in a safe and effective manner

Steps:

- Thorough physical examination
- Adequate fluid and nutrition
- Vitamin specially thiamine supplementation 100mg in B.D. X 5 days then orally X 7 days

Chlordiazepoxide : 50mg qds X 2 days
 25mg qds X 2 days
 10 mg qds X 3 days
 10 mg bd X 3 days then stop

Inpatient Management for :

- Temperature > 101°F
- Seizures (30% develop Delirium Tremens)
- Protracted nausea/vomiting
- Signs of Wernicke Korsakoff syndrome
- Diarrhea

3. Relapse prevention

Important considerations are to find out external or internal cues which can trigger the relapse. External cues are PLACE (where he takes alcohol), PERSON

(with whom he takes alcohol), TIME (when he takes alcohol) and EVENT (important precipitating events are Holy, Diwali, Vijoya dashami etc). These should be addressed properly.

Internal cues are H A L T (Hungry, Angry, Lonely, and Tired). These are the mental and physical states that lead to intakes of alcohol and better mechanism to cope with should be taught.

Medical roles:

A. Pharmacotherapy

- Anti craving drugs

Naltrexone-50mg/day

Acamprosate-666mg three times daily (reduced to 333 mg tds if <60 kg body weight)

Topiramate- 50-300mg in two divided doses

Other drugs e.g. Disulfirum

B. Maintenance of therapeutic relationship

C. Monitoring feedback and assessment of complications

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OPIATE WITHDRAWAL

AT P.H.C. LEVEL

Symptoms of opiate withdrawal are distressing but not life threatening. Characteristic withdrawal symptoms are:

- Dysphonic mood
- Nausea & vomiting
- Lacrimation or rhinorrhoea
- Papillary dilatation, piloerection or sweating
- Diarrhea

- Yawning
- Fever
- Insomnia.

Treatment:

- Detoxification using opiate agonist
- Detoxification using nonopioid medication

1. Detoxification using opiate agonist:

a) Buprenorphine-8mg to start with, gradually increasing until withdrawal symptoms are abated (24-32 mg may be needed). Stabilizing for a period of 1 week, then gradual tapering over a period of 2 weeks. It may or may not be combined with naloxone. Now a combination of buprenorphine (2mg) with naloxone (0.5mg) is available which can be used sublingually for detoxification purpose but better should be guided by a specialist.

b) Methadone / levoacetylalphanmethadol (LAAM)-not available in India.

2. Detoxification using nonopioid drugs :

Clonidine- start with 0.1 mg two to three a day, upto a maximum of 1.2mg, given in divided doses over 24 hrs. peak dose on day 3. Gradually tapered by 0.2 to 0.1 mg per day over a period of 4- 7 days. May be combined with opioid antagonists (Naltrexone).

Recently a drug containing buprenorphine and naloxone in a 4:1 dose is available in market which can be used for detoxification as well as maintenance treatment.

Long term maintenance:

Naltrexone- may be used to prevent relapse by blocking the reinforcing effect of opioids. Relatively safe; does not have any abuse potential of its own, as buprenorphine.

Look for internal and external cues that may lead to relapse. Internal cues- thought/ emotion. External cues- persons/ places/ events. Build appropriate strategies to deal with them.

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ATTENTION DEFICIT HYPERACTIVITY DISORDER**AT P.H.C. LEVEL**

Attention deficit hyperactivity disorder (ADHD) is a buzzword of the day. Lots of information is available in lay press now. This is a very common disorder of childhood and severely disabling also. In a survey it has been found that 3 to 6% of school going children had ADHD. About half of those children diagnosed with ADHD will have problem in their adult life. 30 to 40% of ADHD children have associated learning disability and this is why even when the symptoms are controlled they do not improve scholastically. ADHD causes huge burden among parents and is the reason for poor academic performances. Among all children having tic disorder or obsessive compulsive disorder 40-50% children have ADHD. Though it is a super speciality area in psychiatry, a proper diagnosis and appropriate referral is a must-otherwise many children will grow up with usual naughty boy label, without receiving adequate assistance which is their due. Primary care physicians should have some ideas regarding this disorder because most of the times parents go to a primary care physicians or pediatrician with the child.

Sometimes help is sought much later, even in adulthood, then on looking back, people feel they might have been suffering from this disorder. In adults the symptoms of attention deficit are more prominent rather than hyperactivity. It is never too late to start treatment for ADHD.

Diagnostic features:

There are three groups of symptoms:

- Inattentiveness-the child cannot hold attention for a long time resulting in becoming distracted to any external cues which is know is as distractibility.
- Hyperactivity- though some times the children run around the room or jump from one place to other but many a times the hyperactivity is visible as fidgety movements, swinging legs or tapping fingers.
- Impulsivity- impulsive behaviour is usually described as being unable to stop or not thinking before speaking or acting.

The symptoms must start before the age of seven years.

Management:

Medications like methylphenidate or atomoxetine are now available but this should be supplemented with behaviour therapy and parental counseling and should be done by a person having experience and knowledge in the field.

AT C.H.C./RURAL HEALTH CENTRE LEVEL

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AT SUB-DIVISIONAL LEVEL

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CERTAIN BEHAVIORAL PROBLEMS NEEDING EMERGENCY INTERVENTION

1. Agitation or violent behaviour

AT P.H.C. LEVEL

The cause may be multiple. It may be due to underlying psychiatric disorder or some metabolic cause or may be due to drug abuse or withdrawal. The physicians should try to ascertain the cause for symptomatic management.

Inj. Haloperidol (5mg), Inj. Promethazine (50mg) in combination with or without Inj. Lorazepam (4mg) may be used. The patient should be referred to a psychiatrist for further evaluation and management.

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AT SUB-DIVISIONAL LEVEL

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2. Substance withdrawals:- DELIRIUM TREMENS

AT P.H.C. LEVEL

Delirium tremens ('the shaking madness'), often known as 'the DT's', is a severe form of alcohol withdrawal, which involves sudden and severe mental or neurological changes.

Causes

Delirium tremens can occur after a period of heavy drinking, especially when the person does not eat enough food. It may also be triggered by head injury, infection, or illness in people with a history of heavy alcohol use.

It is most common in people who have a history of alcohol withdrawal.

It is especially common in those who drink the equivalent of 4-5 pints of wine or 7-8 pints of beer (or 1 pint of "hard" alcohol) every day for several months.

It also commonly affects people who have had a history of alcohol misuse or alcoholism for more than 10 years.

Symptoms

Symptoms most commonly occur within 72 hours after the last drink, but may occur up to 10 days after the last drink. Symptoms may get worse rapidly, and can include:

- Body tremors
- Mental status changes
- Agitation, irritability
- Confusion, disorientation
- Decreased attention span
- Decreased mental status
- Deep sleep that persists for a day or longer
- Stupor, sleepiness, lethargy
- Usually occurs after acute symptoms
- Delirium (severe, acute loss of mental functions)
- Excitement
- Fear
- Hallucinations (such as seeing or feeling things that are not present are

most common)

- Highly sensitive to light, sound, touch
- Increased activity
- Mood changes rapidly
- Restlessness, excitement

Additional symptoms that may occur:

- Chest pain
- Fever
- Stomach pain

From the Latin meaning 'Trembling Madness', the threat of delirium tremens is rather understated by its colloquial names such as 'the heebie-jeebies' or 'jazz hands'. It is in fact a terrifying warning of the dangers of prolonged alcohol abuse.

Though it is possible to contract Delirium Tremens from a blow to the head or as a symptom of illness, it is more widely recognised as the result of long term heavy alcohol misuse. The 'DTs' however are not the slight shaking and nausea they are associated with but a very severe form of alcohol withdrawal that can suddenly and dramatically change the sufferers neurological make up. As a condition it quite rightly deserves Medical Emergency status.

TREATMENT

- Thorough physical examination
- Adequate fluid and nutrition
- Thiamine 100mg I.M. twice daily for five days.
- Folic Acid (5mg) 1 tab once daily for seven days.
- Inj. Haloperidol (5mg), Inj. Promethazine (50mg) in combination with or without Inj. Lorazepam (4mg) may be used.
- Hydration should be ensured with plenty of fluids and
- Then high dose of chlordiazepoxide 100-150mg should be used in divided doses daily and tapered off to stop the dose within 4-6 days.

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AT SUB-DIVISIONAL LEVEL

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aged by him. In case there is no Psychiatrist the management will be as done at P.H.C. level.

3. DELIRIUM

Delirium is sudden severe confusion and rapid changes in brain function that occur mainly with physical & sometimes with mental illness. Extensive search should be made for underlying physical disorders as it has a high mortality rate if not adequately treated on emergency basis.

Causes

Delirium is most often caused by physical illness mainly & sometimes by mental illness and is usually temporary and reversible. Many disorders cause delirium, including conditions that deprive the brain of oxygen or other substances.

Causes include:

1. Drug abuse or sudden withdrawal
2. Infections
3. Poisons
4. Fluid/electrolyte disturbances

Patients with more severe brain injuries are more likely to get delirium from another illness.

Symptoms

Delirium involves a quick change between mental states (for example, from lethargy to agitation and back to lethargy).

Symptoms include:

1. Changes in alertness (usually more alert in the morning, less alert at night)
2. Changes in feeling (sensation) and perception
3. Changes in level of consciousness or awareness
4. Changes in movement (for example, may be inactive or slow moving)
5. Changes in sleep patterns, drowsiness
6. Confusion (disorientation) about time, place and person
7. Decrease in short-term memory and recall
8. Disrupted attention and concentration
9. Disorganized thinking
10. Psychosis as hallucination and/or delusion
11. Emotional or personality changes
 - Anger

- Anxiety
- Apathy
- Irritability
- Agitation

Treatment

The goal of treatment is to control or reverse the cause of the symptoms. Treatment depends on the condition causing delirium. Diagnosis and care should take place in a pleasant, comfortable, non threatening, and physically safe environment.

Stopping or changing medications that worsen confusion, or that are not necessary, may improve mental function.

Disorders that contribute to confusion should be treated. These may include:

1. Heart failure
2. Decreased oxygen (hypoxia)
3. High carbon dioxide levels (hypercapnia)
4. Thyroid disorders
5. Anemia
6. Nutritional disorders
7. Infections
8. Kidney failure
9. Liver failure

Treating medical and mental disorders often greatly improves mental function. Medications may be needed to control aggressive or agitated behaviors. These are usually started at very low doses and adjusted as needed.

Medications include:

1. Dopamine blockers (haloperidol, Olanzapine, Risperidone, Clozapine)
2. Sedating medications (Clonazepam or diazepam)
3. Thiamine

It is better to refer the patient to the appropriate speciality according to the cause.

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4. Bereavement

AT P.H.C. LEVEL

Many a times a doctor is called to pacify a bereaved parent or spouse. Apart from Benzodiazepine, other drugs like anti-depressants are usually not suggested in uncomplicated grief. Ventilation of emotion should be assisted by supportive psychotherapy. But if the grief is associated with psychotic features, suicidal thoughts or attempts, strong guilt or resolution does not take place even after 6 months one should consider psychiatric intervention

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5. DYSTONIA

AT P.H.C. LEVEL

Dystonia is a neurological movement disorder, in which sustained muscle contractions cause twisting and repetitive movements or abnormal postures. The disorder may be caused by reaction to pharmaceutical drugs particularly Neuroleptics.

Medication

Medications that have had positive results in some include: diphenhydramine, benztropine, anti-Parkinson's agents (such as Trihexyphenidyl), and muscle relaxers (such as diazepam).

Anticholinergics

Medications such as Anticholinergic (benztropine), which act as inhibitors of the neurotransmitter acetylcholine, may provide some relief. In the case of an acute dystonic reaction, diphenhydramine is sometimes used (though this drug is well known as an antihistamine, in this context it is being used primarily for its anticholinergic role). In the case of Oculogyric crisis, diphenhydramine may be administered with excellent results with symptoms subsiding in a matter of minutes.

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6. EXTRAPYRAMIDAL SYMPTOMS*AT P.H.C. LEVEL*

The extrapyramidal system can be affected in a number of ways, which are revealed in a range of extrapyramidal symptoms (EPS), also known as extrapyramidal side-effects (EPSE), such as akinesia (inability to initiate movement) and akathisia (inability to remain motionless).

Extrapyramidal symptoms (EPS) are various movement disorders such as acute dystonic reactions, pseudoparkinsonism, or akathisia suffered as a result of taking dopamine antagonists, usually antipsychotic (neuroleptic) drugs, which are often used to control psychosis.

Causes

The most common antipsychotic associated with EPS is haloperidol used especially in schizophrenia. Other antidopaminergic drugs like the antiemetic metoclopramide or the tricyclic antidepressant amoxapine can also cause extrapyramidal side-effects.

Conditions

Acute dystonic reactions: muscular spasms of neck – torticollis, eyes – oculogyric crisis, tongue, or jaw; more frequent in children

Akathisia: A feeling of motor restlessness

Pseudoparkinsonism: drug-induced parkinsonism (muscular lead-pipe rigidity, bradykinesia/akinesia, resting tremor, and postural instability; more frequent in adults and the elderly).

Tardive dyskinesia: involuntary asymmetrical movements of the muscles, this is a long term chronic condition associated with long term use of antipsychotics.

Treatment

Anticholinergic drugs are used to control neuroleptic-induced EPS, although akathisia may require beta blockers or even benzodiazepines. If the EPS are induced by an antipsychotic, EPS may be reduced by dose titration or by switching to an atypical antipsychotic such as, quetiapine, olanzapine or risperidone.

Commonly used medications for EPS are benztropine , diphenhydramine , and Trihexyphenidyl

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Chapter VII

OPHTHALMOLOGY



Ophthalmology

1. AC MUCOPURULENT CONJUNCTIVITIS

- Rx
1. Moxifloxacin (0.5%) EI drops (1 drop 6 times daily.)
 2. Moxifloxacin / Gatifloxacin (Eye ointment to apply at bedtime)
For Pediatric Patients
Tobomycin 0.3% EI drops (1 drops 6 times daily)
 3. Analgesic Aceclofenac 100mg (1 tab twice daily after food)
 4. Tab Cefixime / Cepodoxime
Paediatric : 10mg/ body
Adult : 200mg (twice daily after food)

2. BACTERIAL CORNEAL ULCER

Routine investigation –
HB/ TLC / DLC / ESR) Blood Sugar
Microbiological investigation
Gramstain from Scrapped material

- Rx
1. Atropine 1% EI drop (1 Drop 8 hourly)
 2. Moxifloxacin 0.5% or gatifloxacin 0.3% EI drop (1 hourly round the clock X Ist 4 hourly
Or
2 hourly during day and 4 hourly at night till healing is ensured
Or
4 - 6 hourly till healing ensured
 3. Gatifloxacin 0.3% Eoinment at bedtime
 4. System Antibiotic Inj Ceftriaxone 1gm & Inj Sulbactam 500 mg
iv 12 hourly (ANST)
 5. Tab Aceclofenac 100mg with Paracetamol 500mg (1 tab twice daily after food)
 6. Tab Pantiprazole 40mg or tab Rabeprazole 20mg(1 tab once daily before food (in morning)

3. FURGAL CORNEAL ULCER

Routine investigation
HB/ TLC/DLC ESR/Blood Sugar
Microbiological exam –
10% KOH –wet preparation

- Rx
1. Atropine 1% EI drop (1 drop 8 hourly)
 2. Natamycin (5%) EI drop (1 hourly round the clock X Ist 48 hourly)
Or
2 hourly during day and 4 hourly at night
 3. Gatifloxacin 0.3% EI drop (1 drop 6 times daily)

4. Tab flinconazole 150 gm(1 tab daily after food X 2 weeks)
5. Tab Aceclofenac 100mg with Paracetamol 500mg (1 tab twice daily after food)
6. Tab Pantoprazole 40mg or Tab Rabeprazole 20mg (1 tab once daily before food (in morning))

4. VIRAL CORNEAL ULCER

(Herpes Zoster Ophthalmic us)

Investigation – Blood TC/ DC/ HB/ ESR/ Blood Sugar F/pp

Vdrl :- ICTC

- Rx
1. Tab Acyclovir 800mg (1 Tab 5 times daily after food X 10days)
 2. Acyclovir 3% Eointment (to apply 5 times daily X 2weeks)
 3. Cyclopentolate 1% Eldrop or Atropine 1% El drop(1 drop 8 hourly)
 4. Prednisolone 1 % El drop (1 drop 6 hourly)
Or
Loteprednol 0.5% El drop (1 drop 6 hourly)
Or
Dexamethasone 0.1% El drop (1 drop 6 hourly)
Or
Fluromethalone 0.1% El drop(1 drop 6 hourly)
 5. Inj Diclofenac / tramadol (1 amp im SOS)
 6. Tab cimetidine 300mg (1 tab 4 time daily X 2-3 weeks)

If epithelial Defect persists

- corboxy – methylcellulose 0.5% El drop(1 drop 6 times daily)

If intraocular pressure raises

- Timolol maleate 0.5% El drop(1 drop twice daily)

- Tab Acetazolamide 250mg (1 tab twice daily)

For skin lesions :

Clobetasol propionate 0.5% W/W

Gentamycin 0.1% W/W, Zinc

Sulphate 2.5 W/W Cream to apply

5. AC IRIDOCYCLITIS

Investigation – Hb /TC/ DC/ ESR./ Blood Sugar – F/PP

Blood Uric acid VDRL Rhfactors

Urine analysis – Routine / microscopic

Xray Chest P/A view

Xray L/S Spine - AP/ Lat (focus on Sacroiliac jt)

- Rx
1. Atropine 1 % El drop (1 drop 8 hourly)
 2. Steroid – antibiotic Preporation moxifloxacin 0.5% with
Fluromethasone 0.1% El drop
Or

Ciprofloxacin 0.3% with Dexamethasone 0.1% EI drop (1 drop 6 times daily)

3. Oral steroid –

Tab methyl prednisolone (dose – 1mg/ kg)

60 mg daily in morning after breakfast X 7 days

50 mg daily in morning after food X 7day

40 mg daily in morning after food X 7day

30 mg daily in morning after food X 7day

20 mg daily in morning after food X 7day

10 mg daily in morning after food X 7day

4. Tab Pantoprazole 40mg or Tab Rabeprazole 20mg (1 tab daily before meal)

5. Tab. Aceclofenac 100mg with paracetamol 500mg (1 tab twice daily after food)

6. Inj. Ceftriaxone 1gm with Inj. Sulbactrum 500mg (iv 12hourly (ANST)

7. Steroid – antibiotic preparation

Dexamethasone 0.1% with Neomycin 0.5% EI ointment (to apply at bedtime) if there is sign of raised intraocular pressure

Timolol maleate 0.5% EI drop (1 drop twice daily)

Tab Acetazolamide 250mg (1 tab twice daily)

6. TRAUMATIC HYPHAEMA

Rx **1. Atropine 1 % EI drop (1 drop 8 hourly)**

2. Steroid – antibiotic Preparation moxifloxacin 0.5% with Fluomethasone 0.1% EI drop

Or

Ciprofloxacin 0.3% with Dexamethasone 0.1% EI drop (1 drop 6 times daily)

3. Timolol maleate 0.5% EI drop (1 drop twice daily)

4. Nepafenac 0.1% EI drop (1 drop twice daily)

5. Pad and Bandage.

If persist → Need for Paracentesis.

7. OPHTHALMIC NEONATORUM

- Chemical Ophthalmia neonatorum is self limiting .
- Suspected gonococcal Ophthalmia Neonatorum.

- Saline lavage hourly till the discharge is eliminated
- Bacitracin eye ointment (4 times daily)

Systemic therapy – for 7 days with any one :

Ceftriaxone 75-100 mg /kg/day Iv or Im 6hrly

Cefotaxime 100- 150 mg /kg/day Iv or Im 12 hrly.

Ciprofloxacin 10-20 mg /kg/day.

- In case – cornea is involved Atropine sulphate ointment is to be used.
- In case suspected staphylococcus aureus , streptococcus haemolyticus and streptococcus pneumoniae – associated
- Ophthalmia Neonatorum – topical antibiotics such as Moxifloxacin 0.5% El drop and ointment to be used for 2 week .
- In case Neonatal Inclusion Conjunctivitis topical tetracycline 1%

Or

- Erythromycin E ointment 4 times daily x 3 week.

Parents should be treated with systemic Erythromycin.

8. SUBCONJUNCTIVAL HAEMORRHAGE

- Reassure the pt
- Look for the cause and address the cause .
- Topical antibiotics such as gatifloxacin 0.3% El drop (1 drop 4 times daily)

9. SUPERFICIAL PUNCTATE KERATITIS

Antiviral therapy

- Acyclovir 3% E ointment to apply 5 times daily.
 - Topical steroid Such as
 - Dexamethasone 0.1% El drop (1 drop 6 hrly)
- Or
- Fluomethalone 0.1% El drop (1 drop 6 hrly)

10. CORNEAL INJURY

1. Pad and Bandage
2. Atropine 1 % El drop (1 drop 8 hourly)
3. Moxifloxacin 0.5% or gatifloxacin 0.3% El drop (1 hourly round the clock X 1st 4 hourly then 2 hourly during day and 4 hourly at

night.

4. Natamycin (5%) EI drop (1 hourly round the clock X 1st 48 hourly then 2 hourly during day and 4 hourly at night)
5. Tab. Aceclofenac 100mg with paracetamol 500mg (1 tab twice daily after food)
6. Inj. Ceftriaxone 1gm with Inj. Sulbactrum 500mg(iv 12hourly (ANST)

11 .PRIMARY OPEN ANGLE GLAUCOMA

- Investigation:
- a) IOP measurement.
 - b) record of visual status.
 - c) slit lamp examination.
 - d) funduscopy : documentation of optic disc change.
 - e) gonioscopy

Treatment: (single drug therapy)

1. Timolol Maleate 0.5% e/d (1 drop twice daily)
Or
1. Prostaglandin analogue: latanoprost 0.005%
Or
Travaprost 0.004% (1 drop at night time)
Or
2. Adrenergic drugs: brimonidine 0.2% (1 drop twice daily)
Or
3. Carbonic anhydrase inhibitors :Dorzolamide 2% (1 drop twice daily)
(depending upon pt personal and medical factors.)

●If not responding after 7 days follow up or not inclining to target pressure combination is made.

Timolol maleate / brimonidine/ dorzolamide Added with
Latanoprost / brimonidine

Inj Mannitol 1-2 gm/kg body weight is used initially if IOP > 30mm hg.

12. ACUTE PRIMARY ANGLE CLOSURE GLAUCOMA

- Investigation:
- a) IOP measurement.
 - b) Record of visual status.
 - c) Slit lamp examination.
 - d) Gonioscopy

Treatment:

1. Inj Mannitol 1-2 gm/kg body weight is used initially if IOP > 40mm hg.

2. Oral hyperosmotics e.g. Glycerol 1gm/kg BW of 50% solution in lemon juice if tolerated and not contraindicated.
3. Systemic carbonic anhydrase inhibitors e.g. Acetazolamide 500mg stat and 250mg tablets thrice daily X 3days.
4. Topical anti-glaucoma drugs:
 - a) Timolol Maleate 0.5% e/d (1 drop twice daily)
Or
 - b) Prostaglandin analogue: latanoprost 0.005% Or travaprost 0.004% (1 drop at night time)
Or
 - c) Adrenergic drugs: brimonidine 0.2% (1 drop twice daily)
5. Topical steroids:
Prednisone acetate 1% or Dexamethasone 0.1% e/drop (1 drop 4 times daily)
6. Analgesic: tab Aceclofenac 200mg (1 tab twice daily after food)
7. Tab pantoprazole 40 mg (1 tab daily in empty stomach in morning)

DEFINITIVE THERAPY:

- a) Peripheral Iridotomy.
- b) Filtration surgery i.e. Trabeculectomy.

● In presence of cataract, lens extraction by phacoemulsification and IOL implantation

13. ACUTE DACRYOCYSTITIS

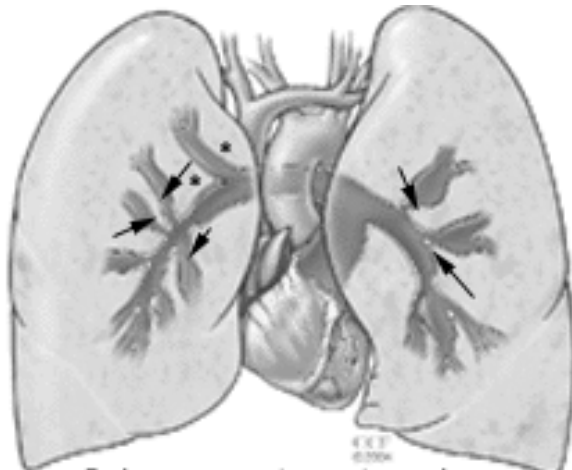
- Rx
1. Moxifloxacin (0.5%) EI drops (1 drop 6 times daily)
 2. Moxifloxacin / Gatifloxacin (Eye ointment to apply at bedtime)
For Pediatric Patients
Tobomycin 0.3% EI drops (1 drops 6 times daily)
 3. Analgesic Aceclofenac 100mg (1 tab twice daily after food)
 4. Tab Cefixime / Cepodoxime Paediatric : 10mg/ body
Adult 200mg twice daily after food.
 5. Hot compression

14. STYE

- Rx
1. Moxifloxacin (0.5%) EI drops (1 drop 6 times daily)
 2. Moxifloxacin / Gatifloxacin (Eye ointment to apply at bedtime)
For Pediatric Patients
Tobomycin 0.3% EI drops (1 drops 6 times daily)
 3. Analgesic Aceclofenac 100mg (1 tab twice daily after food)
 4. Tab Cefixime / Cepodoxime Paediatric : 10mg/ body
Adult : 200mg (twice daily after food)
 5. Hot compression

Chapter VIII

PULMONARY MEDICINE DEPARTMENT (TB & Respiratory Diseases)



BRONCHIAL ASTHMA

Definition:

Asthma is a chronic inflammatory disorder of the airways in which many cells play a role, in particular Mast cells, Eosinophils and T-lymphocytes, and is manifested physiologically by wide- spread narrowing of the airways, which may be relieved either spontaneously or with treatment, and clinically by recurrent episodes of wheezing, breathlessness, chest tightness and cough.

Diagnosis: can be established from-

- History, Clinical presentation, Physical and Systemic examination, Family history.
- Pulmonary function test including bronchodilator reversibility test,
- Broncho- Provocative test, if facilities are available.

Treatment of Acute severe asthma

Primary health centre, Higher centre:-

- Assessment of severity,
- Propped up position,
- Injectable corticosteroid (Hydrocortisone 3-4mg/kg as loading dose → 100-200mg 6 hourly, Methyl prednisolone- 2mg/kg/dose 8-6 hourly, Dexamethasone- 8mg 8 hourly).
- Nebulisation – If facility is available (Salbutamol-5mg, can be repeated after 30 minutes, then 6 hrly, Budesonide-0.5 mg BID) or Salbutamol (100-200µg)- inhalation through spacer (if nebulizer is not available).
- Injectable Methyl xanthine-e.g. Theophylline: 5 – 8 mg/kg 6 – 8 hrly.
- IV access to maintain nutrition, hydration and electrolyte balance (5% Dextrose / DNS:RL- 2:1)
- O₂ inhalation.
- Antibiotic (if indicated)

patient should be sent to Higher centre in presence of 1/or more of the followings, preferably in Tertiary care centre where ICU and X RAY facilities are available.

- Altered sensorium,
- Agitated,
- On speaking, unable to complete the sentence,
- Exhaustion
- Cyanosis,

- Silent chest (no/minimal chest movement during respiration due to severe broncho spasm)
- Suspected complication (pneumothorax, pneumonia, respiratory failure),
- Not responding to standard treatment,

Tertiary care centre

- Initial treatment is same as mentioned earlier.
- In addition to these treatment, if there is suspected pneumothorax, pneumonia, then CXR to be taken and further management accordingly,
- If the patient is in respiratory failure, severe exhaustion, then shift to Respiratory ICU for Mechanical ventilation.

Treatment of Stable Asthma in OPD

Inhalers in combinations like salbutamol, ipratropium, budesonide, formoterol, salmeterol, fluticasone and ciclesonide as metered dose inhaler (MDI) or dry powder inhaler (DPI).

1. Antibiotic if required
2. Oral steroid at times
3. Oral bronchodilators like Doxophylline (10 mg/kg in divided doses), Acebrophylline (100 mg BID), Theophylline.
4. Anti-leucotriens and H1 receptor blockers in combinations like Monteleukast (10 mg OD in adult) and levocetirizine.

COPD (CHRONIC OBSTRUCTIVE PULMONARY DISEASE)

Definition: According to ATS/ERS

COPD is a preventable and treatable disease state characterised by air-flow limitation, that is not fully reversible. The air flow limitation is usually progressive and is associated with an abnormal inflammatory response of the lungs to noxious particles or gases, primarily caused by cigarette smoking. Although COPD affects lungs, it also produces significant systemic consequences. Clinically Chronic bronchitis and Emphysema.

Chronic bronchitis:

Cough with expectorations are present on most days for a minimum of 3 consecutive months per year for at least 2 successive years and cannot be attributed by other pulmonary or cardiac causes.

Emphysema:

Permanent destructive enlargement of air spaces distal to the terminal bronchioles without obvious fibrosis.

Diagnosis:-

Established from History(smoking),Clinical presentation, General physical and systemic examination, Pulmonary function test and Chest x ray.

TREATMENT OF ACUTE EXACERBATION OF COPD

An exacerbation of copd is an event in the natural course of the disease characterised by a change in the patients' baseline dyspnoea, cough and/or sputum, beyond day today variability sufficient to warrant a change in management.

Primary health centre, Higher centre

- Assessment of severity of attack
- Propped up position
- Oxygen inhalation
- Nebulization: If facility is available(levolin, salbutamol-5mg, ipratropium-0.5mg: 4-6 hourly); can be used any one, with or without Budesonide- 0.5-1mg BID.
- Antibiotic if required.
- IV access to maintain nutrition, hydration and electrolyte balance- (5%/ Dextrose / DNS:RL 2:1).
- Injectable corticosteroid (Dexamethasone: 8mg-8-12 hourly, Methyl prednisolone: 0.5mg/kg iv 6 hourly)
- Injectable Methyl xanthine(Aminophylline: 5 mg as loading dose then 0.5 – 0.9mg/kg/day, Theophylline: 5 -8mg/kg)

Patient should be shifted to Higher centre preferably in Tertiary care centre where X ray and Respiratory ICU facilities are available in presence of one or more of the followings-

- Altered sensorium,
- Presence of cyanosis or SpO₂<90%,
- Hypotension(SBP<90mm Hg or DBP<60mm Hg),
- Presence of comorbid conditions(e.g.cardiac problem, renal problem, DM etc).
- No improvement with medications.
- Presence of suspected complications(e.g. pneumonia, pneumotho

rax, corpulmonale, electrolyte imbalance, respiratory failure)

TERTIARY CARE CENTRE

- Initial management is same as mentioned earlier.
- In presence of hypotension- inotropic agent.
- Comorbid condition- treatment as per standard guideline.
- In Presence of complications such as pneumonia, pneumothorax- CXR- PA to be taken.
- Pneumonia to be treated with Broad spectrum antibiotic,
- Pneumothorax may need ICD, depending on the severity of pneumothorax.
- With respiratory failure- patient to be transferred to Respiratory ICU.
- Use diuretics with caution in presence of corpulmonale.

TREATMENT OF COPD AS OPD PATIENTS

- Inhalers: following combinations work better; fluticasone and formoterol, budesonide and salmeterol (either through spacers or dry powder inhalers)
- Ipratropium and tiotropium (either through spacers or as DPI)
- Oral corticosteroids sometime (Prednisolone: 0.5 – 1 mg/kg/day)
- Antibiotics, if necessary
- Drink plenty of fluid.
- Acebrophylline/ Doxophylline as adjuvent
- N-Acetylcysteine: 600mg BID.

PNEUMONIA

Definition:

It is a syndrome caused by acute infection usually bacterial, characterised by clinical and/or radiographic signs of consolidation of a part or parts of one or both lungs.

Community acquired pneumonia(CAP):-

Pneumonia, occurs in a patient who has not hospitalized or residing in a longterm care facility for 14 days prior to onset of symptoms.

Hospital acquired pneumonia(HAP):-

Pneumonia occurring 48 hours or more after admission, excluding infection that

is incubating at the time of admission.

Comorbidities :-

Smoking, asthma, COPD, CCF, immunosuppression etc.

Diagnosis on the basis of clinical presentation and examination findings.

Classical CAP
Gc-poor, sudden onset of high fever with chills, productive cough, rusty sputum, may be blood tinged, pleuritic chest pain, SOB

organisms-
Strept. pneumoniae (common),
H.influenzae etc.

Atypical CAP
Gc-good, gradual onset, low grade fever, dry cough no SOB or chest pain
organisms-
Mycoplasma, Chlamydiae,
Legionella, Rickettsiae, Virus.

MANAGEMENT

Primary health centre – Healthy patient without risk factor

Macrolide- Azithromycin: 500mg OD 3 days or Clarithromycin: 250-500 mg BID 7 – 10 days.

Patient should be sent to Higher centres in presence of one/or more of the followings -

No improvement after 48-72 hours of Antibiotic, patient is toxic, hypotension, in presence of comorbid condition, elderly, require investigations.

Higher centre-Patient without risk factors- Macrolide, as before.

Patient with risk factors(COPD,CCF) in OPD

Fluoroquinolone(levofloxacin: 500-750mg, Gemifloxacin: 320mg, Moxifloxacin: 400mg) or Betalactam(Amoxyclillin: 500 mg TID, Amoxy-Clav.: 625 mg TID, Cefpodoxime: 200 mg BID, Cefuroxime: 250-500 mg BID)
Plus a Macrolide.

Hospitalized patient not at risk for Pseudomonas infection

Either IV Fluoroquinolone/ Betalactam(Cefotaxim,Ceftriaxone,Ampicillin-Salbactam) Plus a Macrolide

Tertiary care centre

Patient should be sent to Tertiary centre, particularly where ICU facility is available, in presence of one/or more of the followings-

No improvement (fever persists) after 48-72 hours of antibiotic treatment
Require further evaluation (e.g. sputum CST, Blood culture, CT scan),

Risk factors- altered sensorium, BUN > 30 mg%, RR > 30, BP – SBP < 90 mm Hg, DBP < 60 mm Hg, age > 65 yrs.

Patient should be sent to ICU in presence of one/or more of the followings-
Cyanosis/PaO₂ < 60 mm Hg, Multi lobar involvement, Hypotension, Oliguria,
Altered sensorium, WBC < 4000, Platelet < 100,000.

Hospitalized patient at risk for Pseudomonas infection

Anti-Pseudomonal Betalactam (Cefepime, Imipenem, Meropenem) /
Piperacillin-Tazobactam Plus IV Anti-Pseudomonal
Fluoroquinolone (Levofloxacin)

OR

IV Anti-Pseudomonal Betalactam Plus an Aminoglycoside
Plus Either a Macrolide/Non Pseudomonal Fluoroquinolone
(Ciprofloxacin).

Doses:

Ceftriaxone: 1-2 gm iv 12-24 hourly, *Cefotaxime:* 1 gm iv 8 hourly,
Cefuroxime: 1.5 gm iv 8 hourly, *Cefepime:* 1-2 gm iv 8-12 hourly,
Imipenem: 500 mg 6 hourly,
Meropenem: 1 gm 8 hourly,
Piperacillin-Tazobactam: 4.5 gm iv 6 hourly,
Amoxicillin-clavulanic acid: 1.2 gm iv 8 hourly,
Gentamycin: 5-7 mg/kg/day in divided doses,
Tobramycin: 5-7 mg/kg/day in divided doses,
Vancomycin: 15 mg/kg 12 hourly, *Linezolid:* 600 mg 12 hrly.

Duration of treatment:- 7-10 days.

LUNG ABSCESS

Definition:

It is a localized area of destruction of lung parenchyma by infection with pyogenic organisms, result in tissue necrosis and suppuration. It frequently contains AIR-FLUID level. Infection with mixed aerobic and anaerobic organisms are most common. Diagnosis can be made from history, and physical and systemic examination. History- conditions(CVA, convulsion, alcohol intake etc) predispose to aspiration of oropharyngeal content; gradual onset with low grade fever, fatigue, wt. Loss, productive cough with expectoration of foul smelling purulent sputum, may associated with haemoptysis.

On Exam.- look sick, Anaemic, finger clubbing; Dullness to percussion, crepitations, bronchial breath sound with decreased intensity.

Management

Primary health centre In suspected cases

Antibiotics-

High dose Benzyl Penicillin: 5 -10 Mega units, can increase upto 24 Mega units per day(AST) Or Amoxycillin: 500 mg TID Plus Metronidazole: 400 mg 8 hrly.

Alternatively- Clindamycin: 600 mg 8 – 6 hrly.

If the patient is very much toxic, needs investigations, no improvement with this regimens should be sent to Higher centre, or if require further evaluation , can be sent directly to Tertiary care centre.

Higher centre if patient attends directly, Regimen- same, Along with,

chest physiotherapy for postural drainage.

CXR and Sputum exam.(Gram. Stain, ZN stain) to be done, if facilities are available.

Depending on the CXR findings(other than lung abscess e.g. malignancy- thick wall cavity with irregular margins), no improvement with treatment or further sputum examination(e.g. CST, Fungus, Malignant cells) and other sophisticated investigations(e.g. CT scan, CT guided FNAC, FOB) are required, patient should be sent to Tertiary centre

Tertiary care centre

If patient attends directly treatment can be started with same regimen; later on depending on the type of organisms identified and CST report, Antibiotic can change.

Example- in infection by β -lactamase producing anaerobes(*B. fragilis*, *Fusobacterium*)

β – lactamase inhibitors- Amoxy-Clav.(Amoxy.: 500mg TID),
Piperacillin-Tazobactam(4.5 gm 8 – 6 hourly)
Vancomycin(15 mg/kg BID)- in case of Methicillin Resistant *Staph. aureus*(MRSA).

Duration of treatment:- 4 – 6 weeks,

PNEUMOTHORAX

Collection of air in pleural space.

Diagnosis:- Suspect from clinical presentation(sudden onset of pain at affected side of chest, dry cough, may be dyspnoea) and on examination: trachea-opposite/central, depending on size of pneumothorax; diminished movement, hyperresonant note on percussion, decreased/absent breath sound on affected side). Confirmation by CXR(absence of lung markings & lung shadow).

Primary health centre

On clinical suspicion, patient may be sent to higher centre where X-ray facility is available.

Higher centre:-

After examination, suspected patient should be advised for CXR- PA view.

From CXR-PA, size of the pneumothorax will be assessed.

Treatment depends on size of pneumothorax

Small to medium size pneumothorax in young adults without any apparent cause, needs no invasive treatments –conservative management (bed rest and O₂).

Intercostal chest drainage(ICD):- ICD in following conditions-

Failure of conservative management (pneumothorax persists after 48-72

hours),
 Deterioration(increasing dyspnoea, cyanosis),
 Moderate to large pneumothorax ($> \frac{2}{3}$ of hemithorax) with collapse lung,
 For ICD, patient should be sent to the centre where facility is available.

Note-

1. Oxygen inhalation in all cases of pneumothorax.
2. Antibiotics if necessary.
3. Secondary pneumothorax (due to tuberculosis, COPD etc) need proper evaluation and be given definite treatment apart from the management of pneumothorax.
4. If complicated with respiratory failure, transfer to RICU (respiratory intensive care unit).

Suspected Tension pneumothorax(increasing dyspnoea, cyanosis)- wide bore needle may be introduced into pleural space through 2nd intercostal space at MCL, connected with water sealed drainage, if ICD facility is not available, as life saving measure, then referred for ICD.

PLEURAL EFFUSION

Collection of fluid in Pleural space.

Diagnosis:-

From clinical presentation, and physical and systemic examination.
 Most commonly present with- Pain/ heaviness in the affected side of chest, Dry cough, Dyspnoea(depending on amount of fluid), Fever (depends on cause) Comfortable(lying on affected side).

On systemic exam. - Trachea shift to opposite side(depends on amount of fluid),
 Affected side of chest moves less during respiration,
 Stony dullness on percussion,
 Breath sound diminished/absent.

Confirmation by CXR(homogenous opacity and obliteration of CP angle on affected side).

Primary health centre

On clinical suspicion, patient should be sent to Higher centre where x-ray facility is available/ patient may be referred directly to Tertiary care centre.

Higher centre

If chest x-ray confirms pleural effusion, should be planned for pleural fluid aspiration (diagnostic and/or therapeutic purpose); OR otherwise patient may be referred to Tertiary care centre where facility for aspiration is available.

Chest X ray finding for pleural effusion

Homogenous opacity
Obliteration of costophrenic angle on affected side
Mediastinum – may shift to opposite side,

Aspiration

1. Diagnostic aspiration, and therapeutic aspiration (depending on amount, symptom) 600ml to 900ml in one sitting; repeat aspiration may be done 1-2 days later, depending on the amount of fluid.
2. Fluid to be sent for cell cytology and biochemistry and microbiological test.
3. Treatment given according to fluid analysis report.
4. Cause of pleural effusion to be searched clinically; and other diagnostic investigations for giving management.

Pleural Effusion- Large OR Bilateral

1. Both diagnostic and therapeutic aspiration repeatedly if required.
2. Fluid sent for biochemical, cytological, ADA, special stain if necessary.
3. Pleural biopsy if necessary
4. Treatment to be given on assessment of cause of effusion; local or systemic.
5. Pleurodesis can be done if the effusion is recurrent or malignant.

HYDROPNEUMOTHORAX/PYONEUMOTHORAX

Presence of air along with fluid/pus in the pleural space.

Suspect- in presence of following-

Respiratory system exam. – Trachea to opposite side, Chest movement diminished/absent on affected side, Hyperresonant- upper part and stony dull- lower

part, Breath sound diminished/absent, Shifting dullness-positive, Succussion splash-positive

Confirmation - by Chest X RAY(Air-Fluid level)

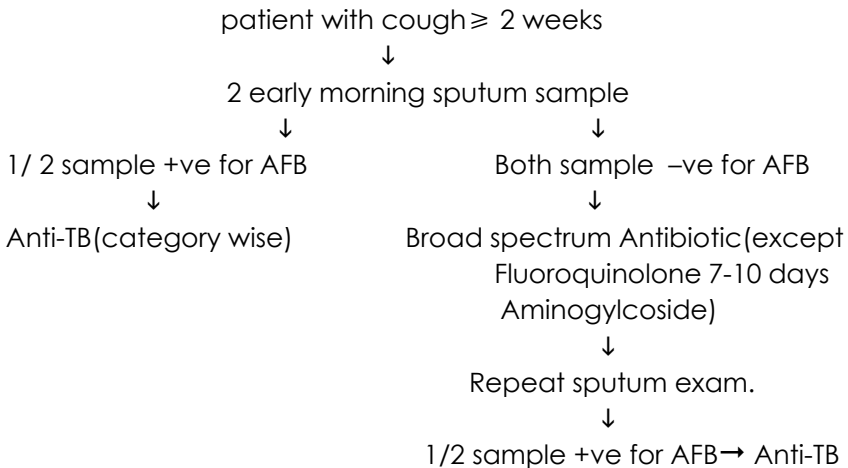
Suspected cases should be sent to Higher centre where CXR and (intercostal chest- drainage)ICD facilities are available.

Treatment- ICD and drugs, as per fluid analysis report.

TUBERCULOSIS

Pulmonary

Primary health centre/Higher centre



If repeat sputum examination is also found to be negative for AFB and patient is symptomatic for pulmonary tuberculosis, then patient should be sent to the Higher centre where X RAY facility is available. If chest X RAY is positive for TB then put on Anti-TB drugs; If chest X RAY is negative for TB? Non TB.

Tertiary care centre

For diagnosis of PTB – Follow the same Algorithm.

Other investigations- e.g. Culture for AFB, CT scan may be done if indicated.

Extrapulmonary TB

Diagnosis of Extra pulmonary TB – Refer to Higher/Tertiary Centre where Facilities for investigations are available.

Investigations:-

FNAC, Histo pathological exam. , CT scan, USG depending on site and indication.

Treatment:-

As per RNTCP guidelines(For new cases- Pulmonary/Extrapulmonary- Cat I, For relapse, Default, Cat I failure- Cat II) Steroid is indicated in serous layer(e.g. pleura,pericardium,intestine,ureter) involvement.

HAEMOPTYSIS

Coughing out of blood from lower respiratory tract.

Most of the time death occurs from asphyxia due to flooding of the airways and lung with blood.

Management irrespective of cause

Primary health centre:

Patient with mild haemoptysis(amount of blood<30 ml in 24 hours)- Rest, Cough suppressant(codein/noscapine) and Haemostatics. Later on, after control of haemoptysis patient may be referred to Higher centre for evaluation.

If haemoptysis increases(moderate 30-100ml,severe >100ml-600ml, massive >600ml in 24 hours,) and general condition deteriorates- patient should be sent to Higher centre or may be sent directly to Tertiary care centre, where X RAY and Blood transfusion facilities are available.

Tertiary care centre

If the patient s' condition is stable, then advice for chest x ray. Hospitalisation, Bed rest, Positioning of patient with suspected side of bleeding to be dependent, IV access, cough suppressant, Haemostatics, preferably injectables,Sedatives, Blood transfusion- if haemoptysis is massive and uncontrolled, Antibiotics. For uncontrolled and recurrent haemoptysis, Bronchoscopy to look for the exact site, and Tamponading and bronchoscopic investigation. Treat accordingly.

ARDS(ADULT RESPIRATORY DISTRESS SYNDROME)

ARDS most commonly occurs in presence of pneumonia(particularly in pneumocystis carinii and influenza pneumonia),sepsis, multiple trauma(in RTA),burns, toxic gas inhalation(in fire fighter), near-drowning etc, after a Latent period of several hours to 2/3 days of primary condition.

Present with – Severe dyspnoea and hypoxaemia refractory to O₂ therapy,
Wide spread opacity on chest radiograph indicative of alveolar oedema in absence of cardiac failure(normal pulmonary capillary wedge pressure).

Management

Patient with suspected ARDS should be sent to Tertiary centre where X-RAY and Respiratory ICU(RICU) facilities are available.

Diagnosis from CXR PA- Wide spread alveolar opacities with normal cardiac shadow. Hypoxaemia($SaO_2 < 90\%$) despite 100% O₂ inhalation.

Management is supportive

1. To maintain patent airway,
2. Oxygen inhalation,
3. Antibiotics,
4. Fluid and electrolyte balance,
5. Transfer the patients to RICU for further management particularly for Mechanical ventilation(IPPV combined with PEEP 5-20cm H₂O),
6. Corticosteroid- not helpful.

RESPIRATORY FAILURE

When lungs cannot maintain adequate gas exchange at rest or during exercise , respiratory insufficiency or respiratory failure is said to exist, results in abnormal blood gases (PaO₂<55-60mm Hg and/or PaCO₂>50mm Hg) when breathing air.

Types-

Type I respiratory failure - Hypoxaemia(PaO₂ low) without rise of PaCO₂(hypercapnia).

Type II respiratory failure- Hypercapnia(PaCO₂ high) with hypoxaemia(PaO₂

low).

As Respiratory failure is a Laboratory diagnosis, so any patient with suspected respiratory failure should be referred to Tertiary centre where facilities for Arterial blood gas(ABG) analysis and Respiratory ICU facilities are available.

Management

Type I respiratory failure:-

- To maintain a patent airway and O₂ inhalation,
- To treat primary condition.

Type II respiratory failure:-

- To maintain a patent airway and O₂ inhalation to correct hypoxaemia,
- To treat the underlying cause,
- In presence of acidosis(hydrogen ion concentration high), patient should be put on Ventilatory support.

LUNG CANCER

Lung cancer is the most frequently diagnosed major cancer in the world and the most common cause of cancer related death in both men and women worldwide.

Suspect for lung cancer:-

Recent change in the character of cough in middle aged and elderly
Particularly in smoker/exsmoker, Haemoptysis

O/Examamination:-

Finger clubbing, Presence of nontender, hard lymph node particularly in cervical/axillary area
Localized wheezing
F/O Collapse(tracheal shift-same side, Dull note on percussion,Breath sound-absent)
F/O Superior vena caval obstruction(puffiness of face, neck and arm oedematous on affected side, venous engorgement over anterior aspect of chest).

Suspected cases should be sent to Higher centre preferably in Tertiary care centre for further evaluation and management.

Chapter IX

PAEDIATRICS



COMMON PAEDIATRICS DISEASES & TREATMENT PROTOCOL

Neonatology:

1) NEONATAL JAUNDICE

Supportive care:

Phototherapy

Adjunct Therapy:

- 1) Intravenous Immunoglobulin (IVIG)- 500mg/kg
- 2) Phenobarbitone- 5-8 mg/kg

Cholestatic Jaundice:

- 1) Diet rich in calories
- 2) Medium chain Triglycerides
- 3) Supplementation:
 - a) Vit A-50,000 IU IM at diagnosis and 10,000 monthly
 - b) Vit D- 30,000 IU IM at diagnosis and 30,000 monthly
 - c) Vit E- 50-200mg/day
 - d) Vit K- 5mg*3days followed by 5mg/week
- 4) Ursodeoxycholic acid- 10-20 mg/kg/day

2) NEONATAL SEIZURES

- Stabilize vital function: Manage airway, respiration, circulation and temperature
- Correct Hypoglycemia: 2ml/kg of 10% Dextrose as bolus injection followed by continuous infusion of 6-8 mg/kg
- Correct Hypocalcemia: 2ml/kg of 10% Calcium gluconate IV over 10 minutes under Strict cardiac monitoring followed by 8ml/kg/day depending on serum Ca^{+2} levels
- Seizures continue despite correction of hypocalcemia, 0.25ml/kg of 50% $MgSO_4$ be given IM, preferably after drawing blood samples for Ca and Mg
- Seizure continuing despite metabolic correction requires antiepileptic therapy
- Phenobarbitone: Drug of choice for neonatal seizures. Loading dose is 20mg/kg/IV slowly over 20 minutes (not faster than 1 mg/kg/min). If seizure persist after completion of this loading dose, additional doses of phenobarbitone 10mg/kg may be used every 20-30 min until a total dose of 40mg/kg has been given. The maintenance dose is 3-5mg/kg in 1-2 divided doses, started 12hrs after load

ing dose.

- Phenytoin: dose 20mg/kg IV @ not more than 1mg/kg/min under cardiac monitoring. A repeat dose of 10mg/kg may be tried in refractory seizures. The maintainance dose is 3-5mg/kg/d (max of 8mg/kg/d) in 2-4 divided dose
- Benzodiazepines: Midazolam: 0.15mg/kg IV bolus followed by infusion of 0.1-0.4mg/kg/hour.
- Other drugs- lidocaine, paraldehyde, valproate, etc.
- Maintainace Therapy- Phenobarbitone 3-5mg/kg/day.

Central Nervous System

3) SEIZURES:

- Sodium Valproate: 10-40mg/kg/day
Twice a day dosing
Most effective drug in most cases
- Lamotrigine: 0.5mg/kg/day initialy, doubled every two weeks
Maximum 15mg/kg/day (monotherapy)
- Levetiracetam: 20-60mg/kg/day (monotherapy)
- Second line drugs:- Topiramate
Zonisamide
Clonazepam- Effective for Myoclonic Jerks

4) FEBRILE SEIZURES:

- Continuous Prophylaxis: Phenobarbitone-5mg/kg/day
Sodium Valproate-20mg/kg/day.
- Intermittent Therapy: Diazepam-0.5mg/kg oral
0.5mg/kg rectal
Clobazam-0.75mg/kg/day
Midazolam-0.3mg/kg/dose buccal/nasal for 2-3 days in 2 Divided doses,

5) NEUROCYSTECERCOSIS:

- Antiepileptic Therapy
- Antiparasitic Therapy: Albendazole-15mg/kg/day in 2 divided dose*28 days
Maximum- 800mg/day
Praziquantel-50-100mg/kg/day in 2 divided doses*28 days

Respiratory System:

6) ACUTE FOLLICULAR TONSILLITIS:

- Amoxicillin- 30-40mg/kg/day in 3 divided doses* 10days
- First Generation Cephalosporins- 30-50mg/kg/d in 2 divided doses

7) ACUTE OTITIS MEDIA

- Amoxicillin- 40mg/kg/day
- Coamoxiclav- 40mg/kg/day
- Decongestants, Antihistaminics and Antipyretics

8) SINUSITIS

- Amoxicillin- 45mg/kg/day
- Other drugs- Amoxiclav, Levofloxacin, Cefdinir, Macrolides etc.

Chronic Bacterial Rhinosinusitis:

- Amoxicillin/Clavulanic acid
- Clindamycin
- Combination of Metronidazole and a Macrolide
- Aminoglycosides

9) ACUTE LARYNGOTRACHEOBRONCHITIS(CROUP):

- Management based on severity of illness
- Mild croup managed at home with simple analgesics and plenty of fluids
- Severe Cases:
 - Administer Oxygen
 - Corticosteroids:
Dexamethasone-0.15mg/kg PO stat, repeat after 12 hrs max 4 such
Prednisolone-1mg/kg, repeated 12 hrly. Budenocide 2mg nebulized, repeated 12 hrly
 - Nebulized Adrenaline- 0.4-0.5ml/kg (max 5ml) of 1:1000 undiluted solution
 - Admission to PICU in severe nonresponsive cases
 - Heliox (helium and oxygen in 20:80 ratio)

10) BRONCHIOLITIS:

MILD	MODERATE	SEVERE
<ul style="list-style-type: none"> ● Alert ● Pink in room air ● Saturation >93% ● Nil/Mild Respiratory signs ● Well Hydrated ● Feeding without shortness of breath 	<p>Any one or more of:</p> <ul style="list-style-type: none"> ● Poor feeding ● Lethargy ● Marked respiratory signs ● Saturation < 94% 	<p>As per moderate plus:</p> <ul style="list-style-type: none"> ● O₂ requirement > 35% ● Severe respiratory signs ● Signs of tiring/CO₂ retention – Sweaty, irritable ● Apnea with cyanosis



<ul style="list-style-type: none"> ● Saline nasal drops before feeds ● Observed oral feeds 	<ul style="list-style-type: none"> ● Saline nasal drops ● Consider NG supplemental feeds ● O₂ via nasal prong/mask ● Suctioning ● Fluid balance ● Consider chest X-ray 	<ul style="list-style-type: none"> ● Consider chest X-ray , <p>CBC, blood culture</p> <ul style="list-style-type: none"> ● ABG if facility available ● Nil by mouth, IV/NG feeds ● O₂ via mask/head box ● Fluid balance, minimal handling
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Normal feeds
No risk factor

Risk factor
Present

<ul style="list-style-type: none"> ● Discharge home ● Follow up in next 48 hours 	<ul style="list-style-type: none"> ● Admit for observation and/O₂. NG needs 	<ul style="list-style-type: none"> ● Consider ICU admission for CPAP/ventilator support
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11) EMPYEMA

- Antibiotics:- Cefotaxime, Ceftriaxone with Clindamycin, Cloxacillin and Vancomycin
- Thoracocentesis and analysis
- Chest tube insertion
 - Indications
 - Ø Large amount of free flowing fluid
 - Ø Respiratory failure
 - Ø Pleural fluid is purulent
 - Ø No response to 48-72 hrs of treatment
 - Guidelines of chest tube insertion:
 - Ø USG underwater seal
 - Ø Clamp the drain for 1 hr once 10ml/kg is initially removed
 - Ø Leave tube in place till drainage is <10-15ml in 24 hr
 - Ø Smaller bore chest tubes are preferable
 - Ø A bubbling drain should never be clamped
 - Ø If fluid draining stops suddenly check for obstruction
 - Ø Coagulopathy should be corrected before chest drain insertion

Cardiovascular System:**12) VENTRICULAR SEPTAL DEFECT**

- Symptomatic Management:
- Child with moderate or large VSD with evidence of CCF
 - Ø Furosemide @ 1-3 mg/kg/day
 - Ø Enalapril- initial dose of 0.1 mg/kg/24hr divided into twice daily, gradually increasing to 0.5mg/kg/day divided into twice daily
 - Ø Digoxin- 10ug/kg/day once or twice
 - Ø High calorie dense feeding and iron supplementation
 - Ø Exercise restriction in associated pulmonary hypertension
 - Ø Good dental hygiene and endocarditis prophylaxis
- Indications of surgical closure:
 - Ø If not improved by 6 months
 - Ø Large VSD with uncontrolled CCF
 - Ø Large VSD with associated severe pulmonary hypertension

13) ATRIAL SEPTAL DEFECTS

- Elective repair at 4yrs of age
- Catheter device closure

14) PATENT DUCTUS ARTERIOSUS

- Preterm Neonates
 - Ø Fluid restriction: 60-70% of usual maintenance
 - Ø Diuretics : 0.5mg/kg/dose every 12hrly
 - Ø Concern : May interfere with action of indomethacin
 - Ø Pharmacotherapy :-
- Indomethacin –
 - Initial dose
 - 0.2mg/kg stat followed by age adjusted doses
 - Subsequent dose
 - <2day-0.1mg/kg/dose 12hrly for 2 days
 - 2-7day-0.2mg/kg/dose 12hrly for 2 days
 - >7day-0.25mg/kg/dose 12hrly for 2 days
- Ibuprofen –
 - 10mg/kg stat followed by
 - 5mg/kg/dose 24hrly for 2 more doses
- **Term neonates and children**

Pharmacotherapy:-

- Diuretics: Reduces preload
- Furosemide 0.5-0.1mg/kg/dose 6-24hrly
- Spironolactone 0.5-0.75mg/kg/dose 6-24 hrly
- ACE inhibitors: Reduces afterload
- Captopril 0.1-2.0mg/kg/dose 8hrly
- Enalapril 0.1-0.5mg/kg/dose
- Digoxin 5mg/kg/dose 12hrly

14) Rheumatic Fever

- General measures:
- Pain relief- Paracetamol/codeine before confirmation of diagnosis
Aspirin after confirmation
- Rest- Arthritis for 2 wks
 - Carditis without heart failure(HF) – 4-6wks
 - Carditis with HF- until HF is controlled
- Anti-inflammatory therapy—Total duration of therapy 12wks
- Arthritis +/- mild carditis
- Aspirin-

Regime-I

- Starting dose: Children 100mg/kg/day*2-3wks
- Adult 6-8g/day-Divide in 4-5 doses
- Tapering doses: Once symptoms resolved, taper to 60-70mg/kg/dose

Regime-II

- 50-60mg/kg/day for total 12wks
- Naproxen (aspirin intolerance)-10-20mg/kg/day
- Aspirin nonresponders- Switch over to steroids ruling out chronic inflammatory myeloproliferative disorder
- Moderate to severe carditis
- Steroids-

Regime I

- Prednisolone: 2mg/kg/day, maximum 80mg/day till ESR normalizes-usually 2wks
- Taper over 2-4wks, reduce dose by 2.5-5mg every 3rd day. Start aspirin 50-70mg/kg/day simultaneously to complete total 12wks

Regime II

- Prednisolone same dose*3-4 wks, taper slowly to cover total of 10-12wks
- Nonresponders – IV methylprednisolone 30mg/kg/day for 3 days

Primary prophylaxis for RF-

- Ø Benzathine Penicillin G- 1.2 million unit(>27kg) single dose (deep IM), 0.6 million unit (<27kg) single dose
- Ø Penicillin V(oral) children:250mg qid* 10 days adult:500mg tid 10days
- Ø Azithromycin(oral) 12.5mg/kg/day once daily 5 days
- Ø Cephalexin(oral) 15-20mg/kg/dose bid 10days
- v Secondary prophylaxis
- Ø Benzathine IM

For adults and children >27kg-1200000 units 3wkly

For children <27kg in weight-600000 units every 15days

- Ø Penicillin V oral children :250mg twice a day, adult:500mg a day
- Ø Sulphonamide oral

For adults and children > 30kg 1g daily

For children < 30kg 500mg daily

Erythromycin-250 mg oral bd

- Duration of prophylaxis-
- Patient without proven carditis- 5yrs after last attack/18 yrs of age whichever is longer
- Patient with carditis- 10yrs after last attack/25 yrs whichever is longer
- Valvular disease/ valve surgery- life long
- Management of chorea- haloperidol 0.25-0.5mg/kg/day

15) HYPERTENSION IN CHILDREN

	SBP or DBP percentile	Frequency of BP measurement	Therapeutic lifestyle changes	Pharmacology therapy
Normal	<90 th	Recheck next scheduled physical examination	Encourage healthy diet, sleep and physical activity	
prehypertension	90 th -< 95 th of BP exceeds 120/80mm of Hg even if below normal percentile upto <95 th percentile	Recheck in 6 months	Weight management, counselling if overweight, introduce physical activity and diet management	None unless compelling indications such as CKS, DM, HF, LVH etc
Stage 1 hypertension	95 th -99 th percentile + 5mm of Hg	Recheck in 1-2wks or sooner the patient is symptomatic: if persistently elevated on two additional locations, evaluate or refer to source of care within 1 month	Weight management ,counselling if overweight , introduce physical activity and diet management	Initiate therapy based on indications or if compelling indications as above

Stage 2 hypertension	>99 th percentile + 5mm of Hg	Evaluate or refer to source of care within 1 wk or immediately if the patient is symptomatic	Weight management, counselling if overweight, introduce physical activity and diet management	Initiate therapy
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- Common anti-hypertensive drugs:
- Enalapril- Initial 0.8mg/kg/day up to 5 days
Max-0.6 mg/kg/day upto 40 mg/day
- Losartan- Initial 0.7 mg/kg/day upto 50mg/day
Max- 1.4 mg/kg/day upto 100mg/day
- Atenolol- Initial-0.5-1 mg/kg/day
Max- 2 mg/kg/day upto 100mg/day
- Amlodipine- Children 6-17yrs 2.5-5 mg once daily
- Frusemide- Intial 0.5-2 mg/kg/dose
Max- 6 mg/kg/day

Gastrointestinal System:

16) ACUTE INFECTIOUS DIARRHOEA

- Oral Rehydration Solution-50-100ml/kg over 4 hrs followed by maintaince dose as per continuing losses. New WHO reduce osmolarity ORS (Na-75, Glucose-75, Osmolarity 245
- Zinc-20mg/day*14 days starting as early as possible. 10 mg/day*2-6mths aged infants.
- Antibiotics- Role is limited.
- Doxycycline- 5 mg/kg/day ,Ciprofloxacin-20 mg/kg/day, if Cholera suspected
- Ceftriaxone 100 mg/kg/day IM or IV once or twice daily/ Ofloxacin 10 mg/kg/day orally in 2 doses*3 days, if Dysentery
- Parental Ampicillin 100-200 mg/kg/day and Amikacin 15 mg/kg/day in 2 doses if associated with pneumonia, toxemia etc,
- Metronidazole-10 mg/kg/day TDS *5 days and 5 mg/kg/day*5days, for Amoebiasis and Giardiasis respectively

Genito-Urinary System:**17) NEPHROTIC SYNDROME**

- Specific treatment
 - Ø Steroid sensitive Nephrotic Syndrome
 - Ø First Episode:
 - Ø Prednisolone 2 mg/kg/day after food*6wks followed by 1.5 mg/kg/ alternate day*6wks
 - Ø Infrequent Relapses: 2 mg/kg/day until remission followed by 1.5
 - Ø Frequent Relapses and steroid dependence
 - Ø Prednisolone till remission followed by maintainance <0.5 mg/kg/ alternate day*12-18 mths/ Levamisole 2.5 mg/kg/ alternate day*6-24 mths/ Cyclophosphamide 2-3 mg/kg/day*2-3 months to achieve accumulating dose of 168 mg/kg
 - Ø Steroid Resistant Nephrotic Syndrome,
- Diet
 - Ø Avoid excessive salt intake
 - Ø Balanced diet< 30% fat and atleast 2 g/kg/day protein
 - Ø Control of Hypertension

18) POST STREPTOCOCCAL GLOMERULONEPHRITIS

- Monitor fluid input/output,BP, urea creatinine and electrolytes
- CBC, renal USG
- Potassium restriction
- Antibiotics- ampicillin/amoxicillin
- Treatment of Hyperkalemia, Hypertension and fluid overload

19) URINARY TRACT INFECTION

- Antibiotics depends on local bacterial susceptibility pattern and changed appropriately once urine culture and sensitivity reports return.
- Duration of therapy is 10-14 days for infants and children with complicated UTI and 7-10 days for uncomplicated UTI.
- Common Antibiotic dosage schedule:-

Parenteral:- Ceftriaxone 75-100 mg/kg/day in 1-2 divided doses/Cefotaxime 100-150 mg/kg/day in 2-3 divided doses/ Amikacin10-15 mg/kg/day single dose/ Gentamycin 5-6 mg/kg/day single dose.

Oral:- Cefixime 8-10 mg/kg/day in 2 divided doses/ Ciprofloxacin 10-20mg/kg/day in 2 divided doses/ ofloxacin 15-20 mg/kg/day in 2 divided doses.

Disorders of Blood

20) IRON DEFICIENCY ANEMIA

- Severe deficiency (Hb<5g/dl) – Packed RBC, Iron Injections
- Oral iron- Ferrous salt preparations containing elemental iron. Recommended dose 3-6 mg/kg/day
- IV iron- dose=weight*3*Hb deficit+500mg for stores
- Prophylaxis- 4 mg/kg/day in <1kg wt and 2 mg/kg/day in >1.5kg wt in preterm babies
- Diet – red meat , beef, pork, fish, cereals, whole grains and dried fruits. Vit C helps in absorption of iron so citrus fruits recommended.

21) THALASSAEMIA

- Blood transfusion if Hb<7gm/dl on 2 occasions, >2 weeks apart or significant clinical manifestations – facial changes, poor growth, fractures, extramedullary hematopoiesis.
- Amount – 12-15 ml/kg, rate 5 ml/kg/hr.
- Iron chelation should be done – after first 10-20 transfusions, ferritin level > 1000 ng/ml
- Chelating agents : Deferioxamine 25-60 mg/kg/day over 8-12 hr iv or subcutaneously / Deferasirox 20-40 mg/kg/day OD oral / Deferiprone 75-100 mg/kg/day in 3 divided doses orally.

22) ACUTE IDIOPATHIC THROMBOCYTOPENIC PURPURA

- Initial specific treatment choices-
 - Ø Oral steroids: Prednisolone – 4 mg/kg/day in 2-3 divided doses for first 4 days followed by 2mg/kg/day for next 10 days followed by tapering over next 4-5 days.
 - Ø IV Methyl Prednisolone – 20-30 mg/kg in NS infusion over 2 hrs, given for 1-3 days.
 - Ø IV antiD globulin – 75 mcg/kg slowly over 5-10 mins single dose.
 - Ø IVIg – single dose of 0.8 – 1 g/kg as infusion slowly over 6 – 8 hrs.

Infectious Diseases

23) MALARIA

- Recommended treatment in chloroquine sensitive malaria:-
P vivax – chloroquine 10 mg base/kg stat orally, followed by 5 mg/kg at 6,24 and 48 hrs(total dose 25 mg/kg)
P falciparum – 10 mg base / kg start orally followed by 10 mg/kg at 24 hrs and 5 mg/kg at 48 hrs(total dose 25 mg base/kg)
- Recommended treatment in chloroquine resistant *P falciparum*:-
Artesunate – 4 mg/kg orally OD for 3 days and single administration of SP 25mg/kg of Sulphadoxine and 1.25 mg/kg of Pyrimethamine on day 1.
- Recommended treatment of complicated and severe malaria –
Artesunate 2.4 mg/kg IV stat then 12 and 24 hrs, then OD or
Artemether 3.2 mg/kg IM stat, followed by 1.6 mg/kg daily, continued for 24 hrs followed by a course of oral artemether+ Sulfadoxine-Pyrimethamine

Chapter X

FORENSIC MEDICINE AND TOXICOLOGY



General Management of Poisoning

A poisoning case is usually an enigma in clinical medicine. Unlike the average clinical case, many overdosed patients are brought to hospital in an unconscious (comatose) condition. Even if a poisoned patient is conscious and alert, he is usually uncooperative and even hostile, since the majority to hospital admission are cases of attempted suicide. Added to these problems is the unfortunate absence of specific signs and symptoms (toxic syndromes), in relation to many poisonous substances. The clinician faced with these problems must develop specific technical skills, and use an astute clinical judgement to fashion appropriate therapeutic measures in treating the patient's condition. Contrary to widespread belief, a doctor faced with a poisoning case does not have a battery of specific antidotes at his command, the administration of which can produce dramatic recovery. Therapeutic emphasis has to be laid on non-specific, resuscitative measures. In other words, the patient's condition must be stabilized and maintained while attempts are made to eliminate the poison. Time must not be wasted in fruitless pursuit of the exact identity of the causative agent.

Many poisoned patients will recover with simple supportive treatment. A minority may require intensive care. In many cases, samples of blood, urine, vomitus, etc. must be analysed.

Any patient presenting with poisoning, the following steps should be instituted in order to have a favorable outcome:-

- 1) Initial resuscitation
- 2) Preservation of body fluids
- 3) Identification of poison
- 4) Non specific treatment
- 5) Specific treatment
- 6) Supportive treatment

1) Initial Resuscitation

Before attempting to diagnose the type of poison, assess:

a) *The patency of airway –*

Upper airway obstruction is one of the most common cause of death in patients dying from poisoning. The first step in resuscitating severely ill patients is to establish an open airway by the following methods :-

- Ø Remove dentures if any.
- Ø Use the chin-lift and jaw thrust method clear the airway obstruction by tongue falling back.
- Ø Remove saliva, vomitus or blood from the oral cavity by suction or the finger sweep method
- Ø In unconscious patient turn him on one side to prevent aspiration.

b) Breathing – (management of respiratory failure) oxygen therapy can be given from oxygen cylinder through nasal tube.

c) Circulation (management of circulatory failure): I.V fluid and electrolyte infusion should be given.

d) Management of CNS depression and control of convulsion: Management of poisoned comatose patients where the identity of the poison is not known, the following three antidotes (called coma cocktail) must be administered :

- i) 50% dextrose -100ml
- ii) Thiamine (vitamin B1) – 100mg
- iii) Naloxone -2mg

The rationale for the coma cocktail is that a significant proportion of poisoned comatose patients in whom the identity of the poison is unknown, comprise cases of overdose from opiates, alcohol and hypoglycemic agents. Even if a particular case is not due to any of these cases, administration of these antidotes is relatively harmless.

Control of convulsion: The drug of choice is diazepam (0.2-0.4mg/kg) slow IV up to maximum 10mg at a time. Alternate to diazepam, phenytoin (diphenyl hydantoin/phenobarbitone) at a dose of 10-20mg/kg IV may be administered.

2) Preservation of body fluids:

i) Blood – Minimum 10 ml of venous blood is to be collected, sodium or potassium fluoride (10mg /ml) and 3mg/ml of potassium oxalate are to be added as preservative.

ii) Urine – 1 ml of concentrated hydrochloride acid or 10 mg of thymol or 100mg of sodium fluoride can be used for 10 ml of urine as preservative.

iii) *Gastric lavage fluids*: Collection of gastric lavage fluid is carried out by introducing $\frac{1}{4}$ the liter warm water (35 c) through the funnel held high up above the patients' head. When the funnel is empty compress the tube below it between the fingers and thumb and lower it below the level of the stomach and its contents will be emptied by siphon action on releasing the pressure on the rubber tubing. Collection of gastric lavage should be done prior to introduction of any antidotes, reducing agents, demulcents etc and send immediately to the laboratory /or preserved in refrigerator at 4c - 8c or small quantity of saturated solution of sodium chloride can be added to the sample as preservative where refrigerator facility is not available.

iv) *Vomit*: Should be collected in a sterile container preferably made of glass and immediately sent to the laboratory or preserved in refrigerator at 4c-8c.

3) Identification of poison

It is impossible to identify every poison by laboratory tests. Therefore, elicit a proper history and carry out a detailed examination.

a) *History*: In majority of cases, a diagnosis of acute poisoning is reached through the history given by the patient, by witness to the episode or on circumstantial evidence. About 80-90% of adults who take poisons are conscious on arrival at the hospital and it is not usually difficult to elicit a history of self poisoning from many of them. However, be very cautious in blindly believing in what they say as some of them lie about the nature of chemical taken and about the amount ingested. The important questions to be asked for in the history include - What was the poison involved?

- How much poison was taken?
- When was it taken?
- By what route was it taken?
- Why was it taken?
- What else was taken along with the poison?
- What are the drugs/ chemicals available at home?
- What is the occupation of the patient?

In the patient is in an altered sensorium and the diagnosis is in doubt, exclude the other causes of altered sensorium like meningitis, encephalitis, subarachnoid haemorrhage, Cerebrovascular accident, metabolic conditions, uremia and hepatic failure. In such situations, try to exclude these conditions by eliciting a detailed history.

b) Examination: The next step in the diagnosis of poisoning is a complete head to toe examination. Perform a detailed examination of the CNS on patients presenting with alteration of consciousness where a diagnosis of poisoning is in doubt. Certain clinical features help in the diagnosis of type of poison involved. Important among them are-breath odour , alteration in level of consciousness, seizures, papillary size, tachycardia or bradycardia, hypertension or hypotension, hyperthermia or hypothermia, slow or rapid respiration, cyanosis with adequate ventilation, sweating, lacrimation, dryness of mouth and skin, retention of urine, jaundice, skin lesions.

4) Non specific Treatment

Non specific therapy is aimed at removing of unabsorbed poison and hastening the elimination of absorbed poison.

A) Removal of unabsorbed poison from the body:-

i) Inhaled poisons:- In case of gaseous inhalations, remove the patient immediately from the site of exposure in to fresh air, artificial respiration and oxygen (6-8 lts/min) should be given. Air passages should be kept free from mucous by postural drainage or by aspiration. In severe bronchospasm aminophylline 250-500mg is given through iv drip in 5% dextrose. In case of pulmonary oedema diuretics may be given.

ii) Injected poison:- If the poison has been injected subcutaneously from a bite or injection a tourniquet (ligature) may be applied lightly proximal to the injection site to prevent lymphatic spread of the poison until antidote therapy is begun. Distal pulse should be maintained during the period of application of tourniquet. A modification of tourniquet is the "Sutherland wrap" that is application of a broad, firm, constrictive (Crape) bandage over the injected or bitten area and also including the entire limb, with the limb placed in a splint. Incision and suction is generally not advised.

iii) Contact poison:- Patient's contaminated clothes, contact lenses and jewellery should be removed immediately. If the poison is applied to the skin or wound or is inserted into the vagina, rectum or urinary bladder, it should be removed by washing with water for 30 minutes and should be neutralised by its specific chemicals. In the case of ocular exposure, irrigate the eyes with normal saline/ water for at least 15-20 minutes.

iv) Ingested poison:-

a) Gastric lavage: Gastric lavage is the preferred method of emptying the

stomach. It is even effective if performed within 4 hours of ingestion. However in an unconscious patient (where lavage performed after endotracheal intubation to prevent aspiration), it is indicated irrespective of the time of ingestion, since gastric motility is reduced and hence gastric emptying is delayed. In case of ingestion of phenothiazines, antihistamines, tricyclic anti depressant or salicylates significant amount of poison can still be recovered after several hours of ingestion because all these drugs delay gastric emptying. A large bore tube (30 F or 36 F, at least ½ inch in diameter) is essential. The tube must be 1.5 meters long. The patient must be placed in the left lateral decubitus position with head at lower level than the feet. A funnel must be present at the end of the lavage tube. Lavage is performed by using fluid aliquots of 3-4ml/kg. In adults, tap water at room temperature may be sufficient. However in young children use isotonic saline preferably at 37°C in order to prevent hypothermia and hyponatraemia. Continue the lavage till return is clear. Once returning fluid becomes clear pour a slurry of activated charcoal (1 gm/kg body weight) or fluid containing antidote is left behind in the stomach so that it may neutralise whatever small quantity of poison is left behind. Ryles tube or a no. 10 -12 Fz catheter can be used for infants or children .After a recent heavy meal the bulky contents are fast removed by emetics.

Contraindication: The only absolute contraindication of gastric lavage is corrosive poisoning (except carbolic acid) owing to danger of perforation.

b) Emetics: Emetics should be used only if there is difficulty in obtaining or using stomach tube. Vomiting should only be induced when a conscious patient is lying on his side with the head dependent. Ipecacuanha powder 1-2gm or 30ml of ipecacuanha syrup for adults, 15ml for 1-12 years children, 10ml for 9-12 months and 5ml for 6-9 months followed by several glasses of water induces vomiting in 90-95% patients within 20-30 minutes.

Contra indication: Only absolute contra indication is corrosive poisoning

B) Elimination of absorbed poison:- Once a poison has been absorbed, its systemic effects can be reduced by accelerating its removal from the body. Various techniques has been used to enhance the elimination of the poison from the body:

i) Renal excretion: The technique of enhancing urinary excretion of a poison is known as forced diuresis. The basic principle is that by diluting the urine concentration gradient between the blood and tubular fluid is reduced and therefore less tubular toxin is reabsorbed. For forced diuresis infuse normal saline or ringers lactate and diuretics to maintain an hourly urine output 4-5ml/kg body

weight.

Forced alkaline diuresis: achieving a urinary pH of 7.5- 9 promotes excretion of drugs that are weak acids such as salicylates, phenobarbital, chlorpropamide, methotrexate etc. A solution of sodium bicarbonate 50-100mEq added to 1 Lt of 0.45% saline may be administered at 250-500ml/hr for first 1-2 hours. Alkaline solution and diuretics should be administered to maintain a urinary output of 2-3 ml/kg/hr.

ii) Purging: 30gm of sodium sulphate with large amount of water hastens the elimination of poison in the stool. Sorbitol 50ml of 70% solution is better purgative but in young children it may cause fluid and electrolyte imbalance.

iii) Whole bowel irrigation: Whole bowel irrigation involves the use of polyethylene glycol with electrolyte lavage solution which is a non absorbable osmotically active compound. This is administered usually by nasogastric tube (0.5lts/hr to children < 5years of age and 2 lts/hr for adults) continuously until the rectal effluent is clear. It is useful in patients who have ingested large quantities of substances that are difficult to remove eg, iron and thallium overdose, sustained release preparations, cocaine and heroine etc.

4) SPECIFIC TREATMENT

Specific therapy of a case of poisoning involves the use of antidotes that counteracts the pathophysiology produced by toxins. The common modes of action of antidotes are :-

- Inert complex formation eg. Chelating agents for heavy metals
- Accelerated detoxification eg. Thiosulphate for cyanide
- Reduced toxic conversion eg. Ethanol for methanol
- Receptor site blockade eg. Naloxone for opiates, atropine for organophosphorus at muscarinic receptor sites.

Types of antidote:

- A) Mechanical or physical antidote : neutralize poisons by mechanical action or prevent their absorption.
- a) Activated charcoal.
 - b) Demulcents – substances which form protective coating on gastric mucous membrane e.g. milk, starch, egg white, mineral oil, milk of magnesia, aluminium hydroxide gel.
 - c) Bulky foods –acts as mechanical antidote to glass powder by

imprisoning its particles within its meshes.

B) Chemical antidote : They counteract the action of poison by forming harmless or insoluble compounds or by oxidizing poisons when brought into contact with them eg. common salt decomposes silver nitrate by direct chemical action by forming the insoluble silver chloride.

Potassium permanganate has oxidizing properties.1:5000 solution is used in poisoning for opium and its derivatives, strychnine, phosphorus, aluminium phosphide, hydrocyanic acid, cyanide, atropine and other alkalies.

C) Physiological antidote : They act on the tissue of the body and produce symptoms exactly opposite to those produced by the poison. eg. atropine and physostygmine are two real physiological antidotes as both of them effect nerve endings and produce opposite effect on heart rate, state of pupil and glandular secretory activity.

Inj. Atropine is used in case of organophosphorus and carbamate poisoning.

List of common antidotes

Poison	Antidote	Trade name of Antidote
Paracetamol	Acetylcysteine , Methonine	Inj. Cilol 200mg/ml(10ml amp).
Cyanide	Amyl nitrite, sodium Thiosulphate ,oxygen	
Organic peroxides (Osmium)	Ascorbic acid	
Cholinergic agents	Atropine	Inj. Tropine 0.6mg/ml (10ml).
Bethylium	ATA	
Amanitins	Benzyl penicillin	
Acids	Beta aminopropionitrile	
Oxalates, fluorides	Calcium salts	
Malignant hyperthermia	Dantrolene	
Iron, aluminium	Desferrioxamine	Inj. Desferal 500mg (5ml).
Chloroquine	Diazepam	Inj. Calmpose 10mg(2ml)
Digitalis glycosides	Digoxin specific antibody fragments	
Arsenic	Dimercaprol	Inj. Dimercaprol(BAL) (100mg)2ml
Methanol, ethylene glycol	Ethanol	

Benzodiazepines	Flumazenil	
Beta blockers	Glucagon	Inj. Glucagen Hypokit(1ml)
Insulin	Glucose & Glucagon	
Botulism	Guanidine	
Mercury	N-acetyl Penicillamine	
Opiates	Naloxone	Inj. Narcotan 200mcg/ml 2ml amp
Peripheral anticholinergics	Neostigmine	
Organophosphates	Oximes	Inj. Clopam 1mg(1ml vial).
Carbon monoxide	Oxygen (Hyperbaric)	
Hydrogen Sulphide	Oxygen	
Copper	Penicillamine	Cap/Tab Cilamin (250mg).
Radioactive metals	DTPA	
Alpha adrenergics	Phentolamine	
Central anticholinergics	Physostigmine	
Coumarin derivatives	Vitamin K	
Thallium	Potassium Hexacyanoferrate	
Beta adrenergic	Propranolol	Tab. Ciplar (10mg, 40mg,80mg)
Isoniazide	Pyridoxine	
Lead, mercury	DMSA	
Methaemoglobinaemia	Toluidine blue	
Heparin	Protamine Sulphate	

5) SUPPORTIVE TREATMENT

Apart from the non specific therapies mentioned earlier, supportive therapy is the mainstay of treatment for any patient with poisoning and is often all that is required. It involves the preservation of vital organ function until the poison is eliminated and the patient resumes normal physiological functions. It also includes the prevention and treatment of secondary complications such as aspiration, bed sores, rhabdomyolysis and sepsis. Once the patient is cleared medically, he should be seen by a psychiatrist to assess the suicidal potential.

** After general management, patient may be referred to higher centre for further management. However, bees and wasp sting may be treated in PHC and CHC. In case of snake bite, patient may be referred to higher centre after giving first aid and polyvalent antivenom if available.

**GUIDELINE OF TREATMENT FOR
SUB-DIVISIONAL HOSPITAL**

General management & specific management in SDH & DH should be followed as per treatment guidelines of poisoning as mentioned & there after patient may be referred to higher centre for further management.

**GUIDELINE OF TREATMENT FOR
SUB-DIVISIONAL HOSPITAL**

General management except laboratory tests & specific management in P.H.C & C.H.C should be followed as per treatment guidelines of poisoning as mentioned & there after patient may be referred to higher centre for further management. However, bees & wasp sting may be treated in P.H.C & C.H.C. In case of snake bite, patient may be referred to higher centre after giving first aid & polyvalent anti venom if available.

GUIDELINE OF TREATMENT FOR STATE LEVEL HOSPITAL
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In addition to the treatment guidelines mentioned in SDH & DH the following investigations should be done at state level hospitals-

- Laboratory examination of the body fluids like blood, urine, gastric lavage fluids, vomitus are being done by Thin Layer Chromatography (TLC), High Performance Liquid Chromatography (HPLC), UV spectro- photometry, Gas Chromatography Mass Spectrometry (GCMS), Atomic Absorption Photo Spectrometry (ASS), Neutron Activation Analysis (NAA). ASS and NAA are used for detection of heavy metal poisoning.
- There are other simple laboratory tests which can assist in the diagnosis and management of patients. These are as follows:-
 - Analysis of urine for ketones in isopropyl alcohol, salicylates and acetone poisoning.
 - Calcium oxalate crystals in ethylene glycol poisoning.
- Arterial blood gas analysis with estimation of the anion gap is important in the diagnosis of some cases of poisoning.
- Metabolic acidosis with high anion gap indicates poisoning by methanol, ethanol, ethylene glycol or salicylates.
- ECG is important in the diagnosis and management of certain poisoning which includes antidepressants, digoxin and other cardio active agents.
- A chest x-ray may confirm aspiration or pulmonary oedema, abdominal x-ray may reveal the presence of radio-opaque ingestions like chloral hydrate and cocaine condoms, heavy metals (arsenic, lead), iron and iodine tablets, phenothiazines and enteric coated tablets.
- Radio Immuno Assay (RIA) & Enzyme Mediated Immuno Assay Technique – mostly used for pharmaceuticals.

SPECIFIC MANAGEMENT OF INDIVIDUAL POISONING

Sl. No.	Name of the poison	Uses	Sign and Symptoms	Treatment	Fatal dose	Fatal period
1	2	3	4	5	6	7
i)	CORROSIVES:					
A.	STRONG ACIDS:					
ii)	INORGANIC:					
a)	Sulphuric acid (oil of vitriol).	Storage batteries Pipe and drain cleaners. Laboratory Industry.	The lips are usually swollen and excoriated and brown or black streaks may be found extending from angle of the mouth to the sides of chin. There is corrosion of mucous membranes of mouth, throat and oesophagus. Burning pain in the mouth, throat & epigastric region, nausea, vomiting, dysphagia & intense thirst. Perforation of stomach may occur resulting chemical peritonitis. Circulatory collapse may cause immediate death.	No gastric lavage, emetics. Nil orally for 2 to 3days. Nutrient substances are given by intravenous route for about a week and then slowly resume to normal diet. Correct circulatory shock by IV fluid. Corticosteroids for reducing stricture formation and antibiotics for prophylaxis. Injection Morphine/Paralgin and phenergan to relieve pain. Tracheostomy if there is oedema of glottis and laparotomy if any perforation of stomach.	10-15ml.	12-24 hours.
b)	Nitric Acid (Aqua fortis)	Electroplating, manufacture of fertilizers, and metal refinery.	Lacrimation, coughing dyspnoea and others like sulphuric acid. GIT perforation less common here. Respiratory symptoms more pronounced.	-do-	10 - 15 ml	12-24 hours.
c)	Hydrochloric acid (muriatic acid)	Metal cleaner Toilet cleaner Laboratory, Industry.	Mucous membrane is at first grey white and later becomes brown or black due to the production of acid haematin. Inhalation of fumes cause intense irritation of throat and lungs with symptoms of suffocation, coughing, dyspnoea and cyanosis. Pain, haematemesis haemolysis, diarrhoea, DIC, Renal failure.	-do-	15 - 20 ml	12 - 24 hours.

ii) a)	<u>ORGANIC:</u> Acetic Acid	Dyeing, Printing, Disinfectant, Vinegar	GIT: burning pain, salivation, vomiting ulceration, haematemesis.	Treatment is on general line with special attention paid to correction of acidosis and renal damage.	50- 100ml of conc. acetic acid.	
b)	Formic acid.	De- scalar, stain remover, Rubber industry (for coagulating latex), Tanning Textile and Paper industry.	CNS: drowsiness, weakness, coma. CVS: Tachy/bradycardia, hyper/hypotension Blood: haemolysis, DIC RS: Aspiration, pneumonitis, shock lung Metabolic- Acute tubular necrosis Skin - erythema, blisters. Local: Skin or mucosal contact results in mild corrosion with hardening and whitish discolouration. However, the white eschar (especially in the skin) drops off in a few days leaving a brown stain. Locally there may be burning pain followed by tingling, numbness, and anaesthesia.	Induction of emesis and gastric lavage are contra indicated. High dose of folic acid (1ml/kg iv bolus, followed by 6doses of 1mg/kg iv at 4hours interval) is recommended, since folic acid enhance formate degradation by the liver. Supportive measures with particular emphasis on dialysis, exchange transfusion, ventilatory support, and correction of metabolic acidosis, and renal failure.	50 - 200 ml.	
c)	Carbolic acid (phenol)	Antiseptic and disinfectant: especially for sterilizing floors, walls, glassware, and in- struments. Preservative : Phenol is a commonly used preservative in aqueous medications. e.g., glucose, penicillin, neostigmine, quinine, and epinephrine. Pharmaceuticals. Manufacture of plastics. Medical uses: "Fenol peel" in plastic surgery Necrolysis for spasticity (by injecting phenol solution into neuromuscular junctions).	Systemic: GIT - Burning pain, vomiting. CNS- Vertigo, convulsions, coma. Pupils are constricted. RS- Slow, laboured breathing, progressing to respiratory failure. Blood- Haemolysis, methaemoglobinemia. Metabolic - Hypothermia, with cold and clammy skin, metabolic acidosis. Hepatorenal - oliguria, with scanty urine which turns greenish on exposure to air be- cause of phenolic metabolites (hydroquinone and pyrocatechol). This is referred to as carboluria . Later there is renal and hepatic failure.	Decontaminate skin by copious washing. Stomach wash can be done preferably with sodium or magnesium sulphate solution. Activated charcoal in the usual manner. Supportive measures.	10 - 15 gr or ml.	3-4hrs. Earliest 10 minutes.

			<p>Burning pain, dysphagia, vomiting and diarrhea, tetany, convulsions, bradycardia, oxaluria-excretion of calcium oxalate crystals, oliguria, haematuria etc.</p> <p>Epigastric pain, vomiting, GI-haemorrhage, tachypnoea, platelet dysfunction, hyperpyrexia, hyper ventilation, metabolic acidosis.</p>	<p>Stomach wash using lime water or calcium gluconate.</p> <p>Calcium gluconate iv (10ml of 10% solution) repeated if required, Dimulcents and supportive measures Dialysis or exchange transfusion for renal failure.</p>		
	Oxalic acid (Acid of sugar).	Ink remover, rust remover, bleaching agent, Industry-Ceramic, leather, paper, pharmaceutical and rubber.	Antipyretic, analgesic, antirheumatic, keratolytic.			
d)	Salicylic acid.			<p>Gastric lavage must preferably be done with sodium bicarbonate.</p> <p><u>Forced Alkaline diuresis</u> - Initially sodium bicarbonate given IV 1-2 mEq/kg, with subsequent administration as required, IV fluids and electrolytes, Vit K1 in severe hypoprothrombinaemia. In severe cases – haemodialysis or haemoperfusion is of benefit. Supportive measure.</p>	<p>15 – 20 gm.</p> <p>Salicylic acid</p> <p>70-80gm.</p> <p>Sodium salicylate & Acetyl salic acid 15-20gm.</p> <p>Methyl salicylate 10-20ml.</p>	<p>1-2 hrs.</p> <p>Shortest 3-10 minutes.</p>

B)	STRONG ALKALIES:					
a)	Ammonia	Refrigerant Cleaning and bleaching agent, Laboratory Industry/fertilizer plastic, explosives etc),	Coughing, sneezing, rhinorrhoea, lacrimation. Pain in the upper GIT, dysphagia, vomiting, delayed stenosis of the GIT. Contact may cause dermatitis, necrosis, & corneal damage or even blindness.	No stomach wash or emesis. Neutralization can be attempted with weak vinegar or lemon juice. Dilutents. Corticosteroid's (prednisolone) in the dose of 1.5-3mg/kg/day for several days or week. Antibiotics may be given concurrently. Skin lesions must be washed with water followed by diluted vinegar. Splashing of eyes necessitates copious irrigation with water or buffer solution.	Gasous form 0.5% in air. Liquid form 10-20ml.	Usually 24 hours.
b)	Hydrates and carbonates of sodium, potassium calcium, ammonia.	Domestic cleaning agents. Industry (manufacture of soaps).	Affected skin or mucosa usually appear greyish, slimy or soapy feeling, abdominal pain, vomiting, diarrhoea.	- do -	5-20gm.	Usually 24 hours.

II	IRRITANT POISON:					
A)	AGRICULTURAL POISON:					
a)	Organo phosphorus	Insecticides And pesticides	Muscarinic manifestation: bronchoconstriction, increased bronchial secretion, dyspnoea, anorexia, nausea, vomiting, cramps, diarrhoea, increased sweating, increased salivation, increased lacrimation, bradycardia, hypotension, miosis. Nicotinic manifestation: initial stimulus results in contraction and later muscle weakness and paralysis hypotension, tachy cardia mydriasis. CNS manifestation are restlessness, drowsiness, confusion, slurred speech, ataxia, generalized weakness, coma, depression of respiratory and cardiovascular centres. Similar to organophos	Atropine is the cornerstone of therapy. Initially, administer 2-4mg/kg for adults and 0.05mg/kg for children iv, Repeat the dose every 5-15 minutes until there is cessation of parasympathomimetic effects like bradycardia, salivation and tracheal secretions. After end point is reached atropine in lower doses and at less frequent intervals so as to maintain atropinization for 24-48 hrs Pralidoxime (pyridine -2-aldoxime methiodide) It is cholinesterase reactivator which primarily acts to counter the nicotinic effects of organophosphates though it can reverse some of the CNS effects also Dosage: 1-2 gm iv slowly over 10-15 minutes while for children, the dose is 25-40mg/kg to a maximum of 1 gm. Dose may be repeated every 6-12 hours for 24-48 hours. Laxix is not used for pulmonary oedema due to increased bronchial secretions.	Mildly toxic (malathion, chlorobion) More than 25gm Moderately toxic (diazinon) 10-25gm. Highly toxic- Less than 5gm Parathion -15-30mg, Methyl parathion -15 mg, TEPP - 5gm.	First 24 hours of ingestion in untreated cases and within 10 days in those treated cases when treatment is not successful.
b)	Carbamates	-do-	phates except effective penetration to CNS doesnot occur and as such CNS toxicity is limited.	Atropine is the specific antidote, dose similar to organophosphorus poisoning. PAM is contraindicated.		

Sl. No	Name of the poison	Uses	Sign and symptoms	Treatment	Fatal dose	Fatal period
c)	Organo chlorines:-	Insecticides Gammabenzene hexachloride lotion is used in treatment of scabies.	Nausea, vomiting and epigastric distress, seizures, dizziness, myoclonus, opsoclonus, weakness of legs. Death occurs due to respiratory failure. Hepatic and renal failure occur in rare case. Cutaneous/skin application of Gammamaxane (Gamma benzene Hexachloride) may lead to toxicity producing above mentioned symptoms especially in children.	Gastric lavage if organochlorine has been ingested. Instill activated charcoal after lavage. Administer cholestyramine to all symptomatic patients as it interrupts the enterohepatic circulation of organochlorine compounds. The dose is 16 g /day in 4-6 divided doses in several days. Control seizures with diazepam and phenobarbital. Dopamine may be given in resistant hypotension. Dialysis is not effective in removing organochlorines. To prevent the transcutaneous toxicity of GBH, wash the body after six hours rather than 24 hours.	Aldrin, dieldrin endrin - 2.5gm. -5gm DDT- 20gm. Gammaxane - 15gm.	01 to several hours.
d)	Rodenticide:- i) Red squill, (low toxicity)	Kill rats, mice, moles, voles and squirrels.	It is a bitter tasting cardiac glycoside with potent emetic properties. It takes advantage of the fact that rats cannot vomit. Humans usually do not develop significant toxicity due to its strong emetic properties. In case of ingestion in high doses toxic features appear within 30 minutes 6 hours and include nausea, vomiting, abdominal pain, blurred vision, ventricular ectopics, ventricular tachycardia and fibrillations.	Symptomatic and supportive treatment. Cardiac complications are best managed by lidocaine or phenytoin.		
	ii) Super warfarins (Brodifacoum, Indanediones)	Rodenticide	Bleeding from various sites such as ecchymosis, hematuria, uterine and vaginal bleeding, hemoptysis, hematemesis.	In children, most ingestions involve small amount of poison and would not require any medical help. If a larger quantity of any and Inediones is ingested or more than one packet of 0.005% of 4-hydroxycoumarins is ingested (as normally occurs in adult patients with deliberate ingestion), induce vomiting if seen within 1 st hour of ingestion. If the patient comes after 1 hour of ingestion use activated charcoal. If the patient develops evidence of bleeding, check the PT and administer VitK1 (phytonadione) which needs to be given for prolonged periods. As Vitk1 is not available in India, administer fresh frozen plasma and monitor the PT for every 48 -72 hours.		

iii) Barium salts: Barium acetate, carbonate, chloride, hydroxide, nitrate and sulphide (insoluble toxicity)	Barium chloride and carbonate are used as rodenticide, pesticide.	Weakness of striated and cardiac muscles and severe hypokalaemia. Initial features are vomiting, loose motions, abdominal pain followed by tachycardia, including ventricular arrhythmia, hypertension followed by hypotension. ECG changes include widened QRS complexes, prolongation of QTC interval, prominence of U waves, occasionally evidence of myocardial damage in the form of elevated ST segments and bundle branch block occasionally patients develop convulsions and rarely renal failure due to deposition of barium in renal calyceal system.	Perform gastric lavage and instill magnesium sulphate to precipitate insoluble barium sulphate in the gut. Control the arrhythmias. For hypokalaemia administer potassium. In case of barium chloride burns, carry out adequate wound debridement by washing the wound with mild soap.	Ba chloride : 1-10gm. Barium carbonate: 2gm.
iv) Aluminium phosphide (Fumigants).	Widely used as grain preservative. Its effect on pests & rodents are due to liberation of phosphine gas.	<p>The clinical features are more or less similar whether phosphine is inhaled or aluminium phosphide is ingested. Nausea, vomiting, diarrhoea, hypotension, shock, cardiac arrhythmias, congestive heart failure, cough, dyspnoea, bilateral crepitations, oliguria and nonoliguric renal failure headache, dizziness, altered mental state are common.</p> <p>In severe exposure to inhalation in adults may result in ARDS (Adult respiratory distress syndrome). Cardiac arrhythmia, Convulsion, coma and death. Severe metabolic acidosis is common later in the course of poisoning. Occasionally hypomagnesaemia or hypermagnesaemia and hypokalaemia occur.</p> <p>Same as aluminium phosphide which is given below.</p>	<p>There is no specific antidote. Early gastric lavage with potassium permanganate (1:10,000) within the first 30-45 minutes. IV Magnesium sulphate in a dose of 3gm bolus followed by 6gm as infusion over 12 hours for 5-7 days. Treat hypoxia with oxygen inhalation and if required by intubation and assisted ventilation. For management of shock, administer 4-6 lts of fluids over 6 hours initially. A low dose dopamine (4-6/mcg/kg/min) is useful to combat shock. The role of IV hydrocortisone is controversial though a few studies have shown beneficial effects.</p> <p>Management of zinc phosphide poisoning is mainly supportive. Induce vomiting if it has been ingested within the preceding hour. Use activated charcoal followed by gastric</p>	150 to 500mg (pellet)

			Rodenticide.		lavage if the patient has presented within 4 hours of ingestion.		
	v) Zinc phosphide (high toxicity).					5-10gm.	With in 24 hours.
	B) INORGANIC POISONS: a) NON METALLIC POISON: Phosphorus:		Yellow/white phosphorus used as paste to control rats occasionally it is used in fire work and gunpowder. Red phosphorus used in manufacture of safety matches. Phosphorus is also used as fertilizer.	Yellow phosphorus intoxication may appear within a few minutes of ingestion but is usually delayed by 03-06 hours. Initial features include garlic like taste, burning in the mouth and throat, nausea, vomiting, diarrhoea, vomitus has garlic odour and is luminous in the dark and later it may contain blood. These are followed by shock, delirium convulsion and coma, in most other cases the above mentioned symptoms abate temporarily. After a gap of 2-6 days, jaundice appears. Abdominal pain increases and distension becomes evident. Hepatic and splenic enlargement occurs. There may be associated fever, headache, restlessness, tremors, dizziness, impaired vision, priapism, drowsiness, coma and convulsions. An ECG may reveal ST-T changes, abnormal P waves, prolongation of PR interval, bundle branch block, prolongation of QT interval, ventricular tachycardia, fibrillation.	Mainly supportive treatment is required. Perform gastric lavage with 1:5000 solution of potassium permanganate which oxidises phosphorus in to harmless phosphoric acid and phosphates. Do not use oils and fats as they increase the absorption of phosphorus.	60 - 120mg.	3-4 hours unmanipulated cases. 7-14 days in treated cases.

S. I. No	Name of the poison	Uses	Sign and symptoms	Treatment	Fatal dose	Fatal period
	b)METALLIC POISON: i)Lead	Paints, used as sindoor, glazing of pottery and enamel ware, plaster, abortifacient, anti-knock for petrol.	In acute cases there is metallic astringent taste in the mouth, vomiting with abdominal colic, constipation, cramps in legs and arthralgia, chronic poisoning cases manifested by facial pallor, anaemia, blue line in the gum (Burtonian line), retinal stippling, colicky, constipation, palsy, encephalopathy, genitourinary (sterility, loss of libido mental	Control seizures with Anticonvulsants. Control intracranial pressure with mannitol, steroids and hypothermia. Establish good urine flow by infusing saline. However, once this is established, restrict fluids to basal maintenance as cerebral oedema is always a concern. If lead levels are 50-69mcg/dl and patient is symptomatic, chelation therapy is	Lead acetate 20gm and Lead carbonate 40gm.	1-2 days.

			<p>irregularities, abortion),hypertensive cardiomyopathy.</p>	<p>recommended. Administer ca EDTA 1000 mg/m²/day deep I.M in divided doses every 8-12hrs or as a continuous IV infusion for 5days. A second course can be given after a gap of 2 days following the completion of the first course. Consider therapy with penicillamine (in a dose of 600mg/m²/ day) if after 5days of ca EDTA therapy, a 24 hours urine sample reveals lead in excess of the amount of ca EDTA administered, Penicillamine therapy should be continued until blood lead and EP levels return to normal.</p> <p>If blood lead levels > 70 mcg/dl are obtained in a symptomatic or asymptomatic patient, start chelation therapy with a combination of ca EDTA and BAL immediately. This is because of the fact that on the first days of ca EDTA therapy, more lead may be mobilised from the bone than is excreted which may lead to a worsening or the appearance of features of lead toxicity. BAL can cross into cells and protect against these increase of central compartment lead. BAL is given IM in a dose of 300mg/m²/day in 6 divided doses. Iron should not be given concurrently because it will form a toxic BAL- iron complex. Ca EDTA should be administered 04 hours after the first day of BAL. Subsequent dose may be given simultaneously. If encephalopathy is present, administer BAL and ca EDTA for 5-7 days. The dose of ca EDTA is 1500mg/m²/day while that of BAL is 450mg/m²/day.</p>		
				<p>In acute poisoning supportive treatment includes gastric lavage, activated charcoal, cathartics, adequate iv fluid to control shock, and maintenance of vital organs. exchange transfusion may be of help in clearing the blood of arsine in the course of poisoning. Haemodialysis is useful as an adjunct in patients with acute renal failure. Chelating with BAL (dimercaprol) in a dose of 3-5mg IM every 4hrs. is given till the urinary excretion is <50kg/24hr. Penicillamine has also been found to be useful in some cases. Recently 2-3 dimercaptosuccinic acid which can be successful in such cases. In chronic poisoning BAL can be used but weigh the benefits against possible BAL toxicity. In Arsine intoxication exchange transfusion and haemodialysis is helpful, role of chelation therapy is uncertain.</p>	200 to 300 mg.	1 to 2 days.

				<p>can also be given as an IV infusion (15mg/kg/hr) in normal saline or dextrose which is preferred method in children. Liver transplantation is only therapeutic avenue open in the presence fulminant hepatic failure.</p> <p>Supportive management is indicated. Administer white of egg or milk to detoxify copper with formation of its soluble salt, albuminate of copper. Perform lavage with potassium ferrocyanide solution which converts copper sulphate into insoluble cupric ferrocyanide. In severe toxicity, chelation can be done initially using dimercaprol 2.5mg/kg, 4th hourly IM. After the acute stage is over begin oral penicillamine in a dose of 2gm 1 day in 4 divided doses for 5-7 days.</p>		
	v) Copper- Copper sulphate (Neola thotha)	Added to the vegetables to keep the green colour of the vegetables.	Vomiting, abdominal pain, malaria, intravascular haemolysis, methaemoglobinemia resulting in cyanosis, jaundice, oliguria, renal failure, scurvy, delirium, coma, complete paralysis of the limbs and corrosion with necrosis of the oesophagus to stomach.		Copper sulphate 30gm. Copper Sub acetate 15gm.	1-3 days.

Sl no	Name of the poison	Uses	Sign and symptoms	Treatment	Fatal dose	Fatal period
C)	ORGANIC POISON a) Animal : i)Snake bite		<p><u>Non venomous :</u> Syncope, hypotension, sweating, feeble pulse, rapid shallow breathing. Bite site may demonstrate multiple teeth impression.</p> <p><u>Venomous:</u> burning pain at bitten site, swelling, discoloration, vomiting, headache, loss of consciousness, drowsiness, dysarthria, dysphasia, convulsion bulbar paralysis, generalized bleeding</p>	<p>For non poisonous snake bite – Only adequate reassurance and symptomatic treatment measure. For venomous snake bite: - Reassurance, immobilize the bitten limb Nonsedating analgesic (paracetamol) is given . Tourniquet may be applied proximal to the bitten site to prevent lymphatic spread. Sutherlands wrap or crepe bandage may be applied . Incision and suction not generally advised. Cryotherapy is contra indicated. Monitor the vitals.</p> <p>Polyvalent Antivenom: Procedure : Dissolve the antivenom in distilled water or normal saline and administer the appropriate dose as an infusion in 500ml of saline at 15-20 drops/min. The infusion</p>	8-12 mg.	<p>Depends an species</p> <p>1-2 days, or ½ - 3 hours.</p>

Name of the poison	Uses	Sign and symptoms	Treatment	Fatal dose	Fatal period
		<p>tendency, malacea, purpuric spots on the skin, renal failure. Bite site may demonstrate Fang tracks (two puncture wounds).</p>	<p>is to be completed in 01-02 hours</p> <p>Dose: begin with 8-10 vials, then wait for 6 hours and if no significant improvement additional 5-8 vials to be given. A final round of 5-8 vials again administered after 6 hours. If a total of 25-30vials have been administered with out much improvement further antivenom therapy is unlikely to be helpful and must be stopped. It is not contraindicated in children and in pregnancy. Other supportive & symptomatic treatment.</p>		
(i) Bee and wasp - Sting.		<p>Pain, swelling, oedema at bites site, headache, fever, myalgia, vomiting, convulsions, syncope. Anaphylactic reaction may occur in previously sensitized individuals.</p>	<p>Local cold compresses, scraping away of retained stinger with scalpel. In the Bee sting site lime can be applied while in wasp sting vinegar or lemon juice is applied. Antihistamine: (diphenhydramine 50mg 6 hrly or chlorpheniramine 4 mg 6hrly) are used. Adrenaline and/or for anaphylaxis Analgesics for pain. Salbutamol or aminophylline for bronchospasm</p> <p>Supportive measures. Immobilise the stung limb, local ice application, treat hypo or hypertension, diazepam IV for convulsions, metochlopramide for vomiting, furosemide for pulmonary oedema.</p>	-	
(ii) Scorpion sting		<p>Local burning pain, swelling, paraesthesia, mydriasis, hypotension followed by hypertension, convulsions, pulmonary oedema, oliguria etc.</p>	<p>Gastric lavage, activated charcoal correction of fluid and electrolyte imbalance. Supportive measures.</p>		
(2) Vegetable poison: (i) Ricinus communis (castor, mole-bean)	<p>Purgative Industrial lubricant (rapese oil). Quick remedy for assorted ailments.</p>	<p>Vomiting, diarrhea, abdominal pain, hypotension, dehydration fever with chills, haemolysis, renal failure.</p>	-do-	5-10 seeds 6mg ricin.	2-3days
(ii) Croton tiglium	<p>The root and oil are sometimes taken internally as</p>	<p>Contact with skin causes inflammation and other similar to castor seed</p> <p>Haemorrhagic gastritis, cardiac arrhythmias, convulsions, cerebral oedema.</p> <p>Skin contact results in irritation, eye contact causes lacrimation and reddening</p>	<p>Decontamination (gastric lavage). Activated charcoal. If needle(s) is inserted the needle should be dissected out.</p>	1-2ml of oil 5-6 seeds.	4-6 hours to 3 days.

iii) Abrus precatorius (Rosary bead, Indian liquorice, etc)	<p>an abortifacient. (It is used as an abortifacient.)</p> <p>Seeds are used in rosary beads, necklaces etc by rural folk. Jewellers in India sometimes use seeds for weighing gold or precious stones.</p>	<p>ingestion causes vomiting, diarrhoea, sweating which may become haemorrhagic. If an extract of the poison is injected there will be local inflammation with cardio vascular manifestation which may lead to death.</p>	<p>Bathe affected skin in vinegar or ice cold water.</p>	<p>90-120mg 1-2 seeds.</p>	<p>3-5 days shorter at 24 hours.</p>
iv) Capsicum Annum (chilly, red pepper, cayenne pepper)	<p>Pickles, sauces, carminative, appetite stimulant, contraindicated to balms.</p>	<p>Skin contact results in irritation and reddening, eye contact causes intense burning, lacrimation and reddening.</p>	<p>In case of ingestion give ice cubes to suck or sips of ice cold water. Supportive measures.</p>	<p>90-120mg 1-2 seeds.</p>	<p>3-5 days shorter at 24 hours.</p>
v) Scaevola (amarantaceae)	<p>Laundry mark, good remedy for assorted ailments.</p>	<p>Ingestion of large quantities cause burning sensation in the mouth, salivation, abdominal pain, vomiting, diarrhoea. Sweating is common. Urine may turn dark.</p>	<p>Supportive measures and symptomatic.</p>	<p>10gm.</p>	<p>12-24 hours.</p>

	Name of the poison	Uses	Sign and symptoms	Treatment	Fatal dose	Fatal period
III) 1) A) B)	<p>SYSTEMIC:</p> <p>Cerebral</p> <p>CNS</p> <p>Depressant</p> <p>ALCOHOL</p> <p>(Ethyl alcohol)</p>		<p>Ethanol intoxication produces varying degree of CNS depression starting from the cortex and in severe cases, involving the midulla. Mild intoxication produces disinhibition, slight visual impairment, incoordination and a slowing of reaction time. In severe cases of intoxication, the most important feature is central nervous system depression resulting in varying degrees of alteration in sensation, coma, hypothermia, hypotension, respiratory failure and death. The breath usually has a characteristic odour. Patients may also vomit which may result in aspiration, respiratory difficulty and respiratory obstruction. Metabolic acidosis is common. Hypoglycaemia occurs in about 12 per cent of children with ethanol intoxication but is rare in adults.</p> <p>Dizziness, weakness, headache,</p>	<p>A gastric lavage is usually not indicated as it retrieves only a small amount of alcohol from the gut. However, if the victim is unconscious, it may be performed after protecting the airway. Activated charcoal does not adsorb ethanol. Treatment is mainly supportive as the patient gradually shows improvement. Always exclude a head injury by proper examination and if required, by a CT scan of the head. Haemodialysis is rarely required because of the spontaneous resolution of the features of intoxication. Avoid the excessive use of intravenous fluids. Always administer vitamin B₁ to such patients if glucose is being administered.</p>	<p>150 - 250 ml of absolute alcohol consumed in one hour.</p>	<p>12-24 hours.</p>

b)	<p>©)Methyl alcohol</p>	<p>pupillary dilatation, retinal oedema, hyperaemia, abdominal pain, damage to basal ganglia and sudden respiratory failure – Characteristically precedes the cessation of the heart beat by several minutes.</p> <p>Classic triad – pinpoint pupil + respiratory depression + coma.</p> <p>Hypotension, CNS depression, tachycardia, hypothermia, convulsions, noncardiogenic pulmonary oedema.</p>	<p>Gastric lavage if patient received within 4 hours of ingestion. Combat acidosis by administering sodium bicarbonate, if $\text{pH} < 7.35$. Ethanol is a specific antidote 10% ethanol at a dose of 10ml/kg is over 30minutes followed by 1.5ml/kg/hr to maintain a blood ethanol level of 100mg/100ml. Alternatively 1ml/kg of 95% ethanol in fruit juice can be given orally for over 30 minutes. 4MP(methylpyrazole) has been used in western countries as an antidote. Haemodialysis is indicated in removing methanol.</p> <p>Gastric lavage first with water and then with 1:5000 potassium permanganate. Purgative such as magnesium sulphate (15g) orally. Antibiotics to prevent pulmonary infection. Give naloxone 0.4-1.2mg/10min see the pupil size, if recovery is minimal administer 1.2-2mg every 3-5mins until response occurs or until 4-10mg naloxone has been given. Dialysis is ineffective. Supportive measures.</p>	<p>15-30ml of 40% methanol have produced deaths where as some patients may survive 500ml of the same.</p> <p>500-1000mg for codeine</p> <p>200-250 mg for morphine</p>	<p>24-36hours.</p>
	<p>OPIOD/ OPIATES(AFIM)</p> <p>Hypnotics & sedatives</p> <p>i)Barbiturates</p> <p>ii)Benzodiazepines</p>	<p>Stupor, coma, bradycardia, hypotension, hyperreflexia and areflexia, hypothermia, bilious skin lesions occurs principally over pressure areas but also between the toes and fingers.Pupils are initially constricted but later in the course pupillary dilatation occurs due to hypoxia. Respiratory depression is an early feature. Early deaths are due to cardiorespiratory arrest. Delayed fatalities may arise from circulatory failure, pneumonia, pulmonary oedema and cerebral oedema.</p> <p>CNS depression, profound coma, significant hypotension, respiratory depression, hypothermia skin blisters are common with diazepam overdose.</p>	<p>Gastric lavage with in first 4 hours of ingestion. Repeated dose of activated charcoal</p> <p>Forced alkaline diuresis is brought about by mannitol (100-200ml of 25% solution) followed by an infusion of 1/2 liter of 5% solution during next 3 hrs. It can be continued for 10-20 liters.</p> <p>Haemodialysis in severely poisoned patients. Supportive measures to the vital.</p> <p>Supportive treatment is the mainstay Flumazenil is the specific antidote given in the dose of 0.5mg iv over 30seconds and if required further 0.5mg over 30 second, total dose not to exceed 1mg.</p>	<p>Long acting – 3 – 5gm</p> <p>Intermediate acting – 2 – 3 gm</p> <p>Short & ultra short acting – 1 – 2 gm.</p>	<p>6-12 hours.</p> <p>4 hours – 7 days.</p> <p>Onset of ultra short acting barbiturate poisoning death may occur within few minutes.</p>

<p>RI CNS STIMULANTS: (Antidepressants)</p>	<p>Anorectics, illicit stimulant.</p>	<p>Euphoria, restlessness, anxiety, agitation, seizures, coma, intracranial haemorrhage, may occur due to severe hypertension and cerebral vasculitis. Systemic features due to sympathetic stimulation are sweating, tremors, muscle fasciculation, rigidity, tachycardia, hypertension, cardiac arrhythmias and acute myocardial infarction occasionally gangrene due to vaso-spastic action, Renal failure.</p>	<p>Do not induce emesis because of risk of sudden onset of seizures. Treat agitation with Haloperidol (5 - 15 mg). Intravenous propranolol may be helpful to treat tachyarrhythmias. Dialysis is not effective. Control seizure and hyperthermia with symptomatic treatment.</p>	<p>1 mg/kg to 4 mg/kg.</p>
<p>b) Caffeine</p>	<p>Beverages (coffee, tea, cold drinks).</p>	<p>Tinnitus, scotomas, muscle fasciculations, lethargy, yawning, depression, fatigue. In severe cases nausea, diarrhoea, vomiting, fluctuating level of conscious, arrhythmias, AV blocks.</p>	<p>Supportive management indicated. Diazepam and Phenobarbital IV for control of seizures. Exchange transfusion for neonates. Beta-blockers may be useful in treating tachyarrhythmias.</p>	<p>5.3 gm in child and 6.5 gm in adult.</p>
<p>ci) Tricyclic anti- Depressants</p>	<p>Anticholinergic, antiarrhythmic action.</p>	<p>Hypotension, arrhythmias, coma, seizures, and hyperthermia. Delirium is characterised by agitation, disorientation and psychotic behaviour. Urinary retention and ileus are common due to anticholinergic effects. Aspiration pneumonia, ARDS and Rhabdo- myolysis, acute renal failure may occur.</p>	<p>Gastric lavage and oral administration of activated charcoal. Sodium bicarbonate to be given IV, 50ml as bolus dose repeat until pH is 7.45 - 7.55. Symptomatic treatment for convulsion and correction of acidosis. Sedation with oral or IV diazepam. Phenytoin may enhance intraventricular conduction in some patients. It has been used in rare cases of continuous seizures. Inotropics like dopamine,</p>	

	<p>1st generation. (trazepine, Amisulpride, propylthiouracil)</p> <p>2nd generation. Amisulpride, meprobital</p> <p>Newer agents. Fluzone, trazodone (paroxetine)</p>			dobutamine and vasopressor may be used.	1 gm	
	C) DELIRIANTS a) Datura	Stupefying agent mainly used as Road poison.	Dryness of mouth, difficulty in talking, dysphagia, dilatation of cutaneous blood vessels, dilatation of pupils, dry and hot skin, dysuria, drunken gait, delirium, drowsiness leading to coma. Tachycardia, ataxia, frank psychosis, extrapyramidal features. In fatal cases, stupor, coma and convulsions. In fatal cases stupor, coma, convulsions occur. Death occurs due to respiring paralysis or cardiovascular collapse. In near cases: hyperreflexia, extensor plantar response, decerebration, elevated SGOT, SGPT and LDH and prolonged prothrombin time occurs.	Perform a Gastric lavage with potassium permanganate (1:5000) solution. Charcoal has been seen to reduce the absorption of toxins from gut. Physostigmine in a dose of 1-2mg given slow IV for over 5 minutes repeat the same dose every 10 minutes until the cessation of life threatening condition. Do not exceed 4mg in 30 minutes. According to some author the role of physostigmine is controversial. Only supportive treatment is usually sufficient to control toxicity. Control hyperthermia by external cooling.	50-100 seeds (0.6-1 gm)	12-24 hours.
Sl no	Name of the poison	Class	Sign and symptoms	Treatment	Fatal dose	Fatal period
	b) Cannabis		Anxiety, panic, fear of death, restlessness, hyperactivity, euphoria, vivid sense of happiness, patient laughs uncontrollably, after 2-4 hours patient becomes lethargic and drowsy. Other features are nystagmus, tremor, hallucination, pupillary constriction, altered colour vision, dry mouth, increased appetite especially for sweets. Hypothermia, tachycardia, diarrhoea, weakness, fever with chills, albuminuria, renal failure, muscle pain. Tachycardia, hypertension, hyperthermia, increased respiratory rate, nausea, vomiting, mydriasis, tremulousness, seizures, respiratory arrest, cardiovascular collapse, hyperactivity, irritability, insomnia, mood lability, agitation, psychosis, delirium, stupor and coma, other features include headache, seizures, transient ischaemic attacks, stroke, toxic	Most often no treatment is required as features of toxicity disappears within a few hours. As these patterns are violent, IV diazepam or haloperidol 5-10mg IM or IV may be used. Supportive treatment is the mainstay IV diazepam in dose upto 0.5mg/kg given to control seizures. For ventricular arrhythmias 0.5-1mg of propranolol IV can be advocated. Haloperidol for psychosis may be	Charas 2gm/kg ganja 8gm/kg bhung 10g/kg body weight. 1gm orally.	Several days
	c) Cocaine	Local			1-3gm orally.	Few minutes to few

		Anaesthetic.	encephalopathy and dystonia. Arrhythmias, myocardial infarction, myocarditis, shock, pneumomediastinum. Cocaine body packer syndrome – a person who swallows cocaine containing packets so as to smuggle the drug is prone to develop cocaine intoxication.	given. Control hypotension and tachycardia. To treat coronary vasospasm use nitroglycerine and calcium channel blockers. Correct acidosis.	hours.
			Intense bitter taste, feeling of restlessness, anxiety, convulsions (opisthotonus) clonic tonic type affecting all the muscles at a time, Risus sardonicus (spasm of facial muscles producing characteristic grimace) mydriasis, hyperthermia, rhabdomyolysis, myoglobinuria, renal failure, respiratory failure. Consciousness is retained till the very end.		
			Gradual paralysis of respiratory muscles, limbs, headache, vertigo mydriasis, blurred vision, hypotension. Short phase of excitation with muscles movements even convulsions followed by depression with loss of consciousness.	Supportive treatment. Like oxygen and assisted ventilation. Decontamination measures (stomach wash) can be considered after convulsions have been controlled. Activated charcoal is beneficial. Control muscle spasms with IV diazepam, barbiturates, if this fails administer general anaesthesia with or without muscle paralyzing agent. Treatment must be carried out in quiet and dimly lit environment.	60-100mg or one crushed seed.
2)	SPINAL POISON a) Strychnine			Atropine 0.6mg to 1.2mg followed by neostigmine 5-10mg IV. Physostigmine 3ml of 1:200 solution IV is useful. Artificial respiration should be started.	few hours.
3)	PERIPHERAL: CURARE	Anaesthetic agent, arrow poison.			60mg. 1-2 hours.

	Name of the poison	Uses	Sign and symptoms	Treatment	Fatal dose	Fatal period
4)	CARDIAC POISONS	a) Oleander Roots to seeds are used for committing suicide or homicide, criminal abortion and cattle poisoning.	Burning pain and dryness in the mouth, tingling in the tongue, vomiting, diarrhoea. Premature ventricular ectopics, ventricular bigeminy, ventricular tachycardia, ventricular fibrillation, AV junctional exit block, low blood pressure death due to peripheral circulatory failure.	Perform gastric lavage. For bradycardia and conduction defects use atropine and if required insert a temporary pace maker. Lignocaine and phenytoin are useful in the treatment of ventricular arrhythmias. DC conversion if required. Correction of electrolyte imbalance and transfusion of fluids as and when required.	8-10 seeds 15-20gm of root 5-10 leaves.	2-3 hours.
		b) Aconite (mitha bish) Used to enhance in toxicating properties of alcoholic liquors, arrow poison, cattle poison, etc. Rarely used as homicidal poison.	Burning sensation from mouth to the stomach and tingling numbness in mouth, tongue and pharynx. This is followed by salivation, nausea, vomiting, diarrhoea, tingling and numbness are then felt all over the body. Headache, giddiness, pallor, profuse sweating. Alternate constriction and dilatation of the pupil (biphas), hypertension, cardiac arrhythmias with AV blocks. First there is tachycardia but in late stages bradycardia ensue. There is marked general muscular weakness, paralysis of heart or respiratory centres.	Stomach wash with luke warm water. Atropine may be given to avoid vagal inhibition. Artificial respiration and oxygen inhalation to combat respiratory embarrassment and other supportive measures as and when required.	20-30ml of tincture of aconite. 1gm root.	1-5 hours. May be delayed up to 20 hours.

5)	c) Nicotine Stimulant to CNS and is abused widely all over the world in the form of inhalation (cigarette, cigar, pipe, beedi), nasal insufflation (snuff) or chewing. Also used as insecticide.	Burning in mouth and throat, miosis, salivation, lacrimation, irritation, sweating, vomiting, increased pulmonary secretions, hypertension and bradycardia, in severe cases hypotension and seizures may develop. Death results from respiratory failure.	Gastric lavage with potassium permanganate. A purge and colonic wash out. Mecamylamine (Inversine) is a specific antidote given orally. Protect airway, oxygen and other symptomatic therapy.	40-60mg of nicotine. 15-30gm of crude tobacco.	
	ASPHYXIANTS	Cherry red colour of blood and tissues (including skin) is seen only in 2 to 3% of cases. ¹ Development of cutaneous bullae (blister) is another uncommon finding in clinical practice. ² Recovery from the acute episode may be followed by permanent neurological sequelae such as dementia, amnesia, psychosis, parkinsonism, paralysis, chorea. Blindness, apraxia, agnosia, peripheral neuropathy, and urinary/faecal incontinence. ¹ Mild Headache, nausea, vomiting, dizziness, exertional (COHb>30%) dyspnoea	Immediate removal from the contaminated environment. Oxygen (100%) through a tight-fitting mask or endotracheal tube, until COHb falls to 15 to 20%. Monitor cardiac and respiratory status. Watch for the development of cerebral oedema with serial neurologic exams, CAT scans, and fundoscopic examination. Hyperventilation (PCO ₂ 25 TO 30MM Hg), head elevation (35°), and mannitol (0.25 to 1gm/kg of 20% solution over 30minutes) are recommended as initial management of raised intracranial pressure. The role of corticosteroids is controversial. Metabolic acidosis must not be treated aggressively. Sodium bicarbonate is not recommended.	COHb 50-60% is lethal.	

b)Carbon dioxide		<p>Moderate: Chest pain, blurred vision, confusion, weakness, (COHb 30 to 40%) increasing dyspnoea, tachycardia, tachypnoea, ataxia</p> <p>Severe: Triuma, muscle spasm, convulsions, palpitations, (COHb >40%) disorientation, ventricular dysrhythmias, hypotension, myocardial ischaemia, respiratory failure, coma.</p> <p>The symptoms vary with concentration of the gas. 5% concentration of CO₂ in air (i.e. above the concentration in alveolar air) causes laboured breathing and mental confusion. Above 10% produce ataxia and unconsciousness. Air containing 30% of pure CO₂ does not produce any effects for some time. With 40% there is dyspnoea, disorientation, and muscular weakness. With 50% there is dyspnoea, a feeling of tightness in the chest, fullness in the head, ringing in the ears and loss of muscular power followed by drowsiness, unconsciousness, coma and death. 60 to 80% of CO₂ causes immediate unconsciousness with or without convulsive movements and rapid death due to some vasovagal reflex causing cardiac arrest, triggered by a chemoreceptor stimulus.</p>	<p>Convulsions can be controlled with IV diazepam or phenytoin in the usual manner. Physical activity should be restricted for at least 1 month after the exposure to minimize the incidence of cerebral demyelination. Antidote:In severe carbon monoxide poisoning when COHb > 25%, administration of hyperbaric oxygen (HBO) acts as antidote.</p> <p>Artificial respiration and oxygen should be given freely. Cardiac stimulants are useful.</p>		
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<p>c)Cyanide, Hydrocyanic acid</p> <p>Hydrogen cyanide(gas)</p> <p>Sodium & potassium cyanide(salt).</p>	<p>Industrial: electroplating, metal processing, extraction of ores, photographic processes, production of synthetic rubber, and manufacture of plastics.</p> <p>Agriculture: insecticide and rodenticide.</p> <p>Laboratory: cyanide is used in various laboratory processes.</p>	<p>Cyanide poisoning can occur via inhalation (where death can occur within minutes), ingestion and through the skin or mucous membrane absorption (where death may not occur for 3-4 hours). When inhaled, the symptoms are evident within seconds and the patient is usually dead by the time he is brought to a hospital. The major organs involved due to tissue hypoxia are the CNS, GIT, respiratory and cardiovascular systems.</p> <p>Central nervous system: The involvement of the CNS leads to dizziness including true vertigo, headache, sweating, anxiety, confusion, drowsiness, syncope, opisthotonus, hyperthermia (with cyanogens), seizures, paralysis, coma and death. Gastrointestinal system: The features of GIT involvement occur after the ingestion of cyanides and include an acidic and burning taste, throat numbness, salivation, fothing at the mouth, nausea, vomiting, and substernal and epigastric pain. Respiratory system: Initially tachypnoea and dyspnoea develop due to the stimulation of the respiratory centre and carotid chemoreceptors caused by local hypoxia. Bradypnoea, hypopnoea and irregular respiration (characteristically, a short inspiration and greatly prolonged expiration),</p>	<p>Ventilate the patient with 100 per cent oxygen using an Ambu's bag. If a cyanide-exposed patient has only restlessness, anxiety or hyperventilation, oxygen administration and careful monitoring is all that is required. Antidotal therapy is not indicated in such cases. In seriously ill patients, after the initial oxygenation, the most important step is to produce methaemoglobinemia. Do not waste time in emptying the stomach. If a diagnosis is suspected, immediately ventilate the patient with 100 per cent oxygen and at the same time, place broken amyl nitrite pearls under the patient's nose for 15-30 seconds every minute. As soon as possible, inject sodium nitrite i.v. and discontinue the pearls. Administer 10ml of a 3 per cent sodium nitrite i.v. at a rate of 2.5-5ml/minute. For children, the dose is 0.2ml/kg body weight. The use of nitrites commonly causes hypotension which should be managed by fluids and if required, by using a vasopressor. Nitrites induce a state of methaemoglobinemia which dissociates cyanide from cytochrome oxidase by forming cyanomethaemoglobin. After nitrites have been given, administer sodium thiosulphate in a dose of</p>	<p>Hydrogen cyanide: Inhalation of 1part in 2000can kill instantaneously, 1 part in 10,000 within a few minutes, 1part in 50,000 within a few hours. The upper limit of safety is 1 part in 100,000.</p> <p>Hydrocyanic acid: 50 to 100mg.</p> <p>Cyanide salts {</p>	
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		<p>pulmonary oedema, cyanosis and respiratory arrest occur later. The breath has a typical garlic odour. Cardiovascular system: Initially hypertension along with reflex bradycardia and sinus arrhythmia occur. This is followed by hypotension, tachycardia, arrhythmias and terminal asystole. The ECG may reveal non-specific QRS, and ST-T changes. The patient develops severe lactic acidosis. The venous oxygen tension approaches that of arterial oxygen tension and therefore, the venous blood in the initial stages is bright red. This can be easily appreciated by examining the fundus for retinal arteries and veins; both will appear equally bright. Nitroprusside toxicity: Patients on a nitroprusside drip may develop muscular fatigue, nausea, vomiting, confusion, hallucinations, convulsions, coma and death due to cyanide toxicity.</p>	<p>50ml of a 25 per cent sodium. This picks up cyanide ions from cyanomethaemoglobin and produces non-toxic thiocyanate, which is excreted in the urine. Once the patient has been stabilized, empty the stomach with a gastric lavage. Instil activated charcoal at the beginning and end of the lavage. The lavage may be performed using oxidizing agents such sodium thiosulphate (5per cent solution) or 1: 10,000 solution of potassium permanganate. Another antidote available in some countries is dicobalt ethylenediaminetetracetic acid (dicobalt edentate; kelocyanor) which chelates cyanide. It is given in a dose of 300 mg i.v. over three minutes and may be repeated. However, it can produce severe laryngeal and pulmonary oedema. Hydroxycobalamin (vitamin B₁₂) which binds cyanide into non-toxic cyanocobalamin is also an important antidote. Aminophenols which produce methaemoglobinaemia more rapidly than nitrites have also been used experimentally with success. Another experimental therapy is use of stroma-free methenoglobin. Hyperbaric oxygen may be considered if the patient is refractory to standard therapy.</p>	<p>ofsodium, potassium, or calcium): 100 to 200mg.</p>	
d) Hydrogen sulphide (H ₂ S)	<p>In great dilution, there is feeling of dullness and sleepiness, and death may occur during sleep without the victim regaining consciousness. In weak concentration, there is cough, giddiness, nausea and feeling of oppression. The breathing is laboured and heart irregular, cyanosis of the face, inflammation of conjunctivae, lachrymation and photophobia, muscular weakness and prostration. In moderate concentration, metabolic acidosis secondary to anaerobic metabolism occurs. This results in CNS, respiratory and myocardial depression. There may be delirium, convulsions or coma, and death occurs from asphyxia. If breathed in a concentration of 0.1 to 0.2%, death occurs immediately from paralysis of respiratory centre. Its toxicity and rapidity of action are comparable to hydrocyanic acid.</p>	<p>Remove the victim from the source of exposure (the rescuer should take care that he doesn't get poisoned himself).</p> <p>ii. 100% oxygen inhalation, assisted ventilation, etc. Hyperbaric oxygen has not been proved conclusively to be of any extrabenefit.</p> <p>iii. Antidote: Amyl nitrite and sodium nitrite enhance the formation of methaemoglobin which gets converted to sulfmethaemo-globin, which in turn is spontaneously detoxified in the body. The doses of amyl nitrite and sodium nitrite are the same as for cyanide poisoning. Sodium thiosulphate is not necessary.</p> <p>iv. Supportive measures: Correction of electrolyte imbalance, pulmonary oedema, etc.</p>	<p>Inhalation of the gas in concentrations of over 500 ppm can cause death.</p>		

<p>muscaria).</p>		<p>Loss of appetite, diarrhoea, marked oedema of the legs, generalized anaemia, severe cases have myocardial damage, hypotension, feeble pulse, liver is enlarged, tingling and hyperaesthesia of skin, tenderness of calf muscles, dimness of vision, glaucoma. Death occurs from damage to the heart (epidemic dropsy).</p>	<p>5) Atropine sulphate whenever necessary.</p> <p>6) Thiocetic acid infusion with glucose in a dose of 300mg/kg/day in 4 divided doses for 7-14 days, however the value of this treatment is doubtful.</p> <p>7) Anti phalloidin serum.</p> <p>8) Haemodialysis.</p>		
<p>iii) Argemone mexicana (katila) prickly poppy, yellow poppy</p>	<p>Adalationion for mustard oil or other vegetable oils.</p>	<p>Gastrointestinal toxicity: Virtually all hydrocarbons when ingested produce nausea, vomiting, abdominal pain and sometimes diarrhea. The ingestion of benzene and turpentine can produce haematemesis.</p> <p>Pulmonary toxicity: This can be divided into early and late toxicities. Immediately upon aspiration, there are signs of irritation of the oral mucosa and the tracheobronchial tree in the form of a burning mouth, coughing, choking and gasping. The initial cyanosis is due to the replacement of alveolar oxygen by vaporized hydrocarbon. However, as the compound spreads rapidly to the lower levels of the respiratory tract, bronchospasm may develop resulting in a mismatching of ventilation and perfusion. This exacerbates hypoxia and CNS depression. Intercostal and subcostal recessions are common. The destruction of airway mucosa can cause atelectasis, bronchopneumonia and the formation of a hyaline membrane. In severe cases, haemoptysis may occur. Haemorrhagic pulmonary oedema may quickly progress to shock and cardiorespiratory arrest. In the late phase, the patient may develop pleural effusion, pneumothorax and pneumothorax.</p> <p>CNS toxicity: Volatile petroleum distillates and halogenated hydrocarbons may rapidly attain a high concentration in the CNS and suppress the central ventilatory drive. The other acute effects include coma and seizures. Some compounds may produce initial euphoria, agitation, hallucinations, tremors and seizures followed CNS depression.</p>	<p>Good diet and supportive measures. Bed rest, leg elevation, protein rich diet. Supplements of calcium, Thiamine and other B vitamins. Corticosteroids, Diuretics, management of cardiac failure by salt restriction and digitalis. Glaucoma may require surgical intervention.</p> <p>Section of the secretion from the upper airways. Due to risk of aspiration, do not perform gastric decontamination or induce emesis in patients ingesting any volume of hydrocarbons. Continuous positive airway pressure or high frequency jet ventilation is beneficial. Absorption of ingested kerosene can be slowed by giving 250ml of liquid paraffin orally. Corticosteroids and antibiotics are not indicated.</p>		<p>Within 24 hrs.</p>
<p>b) Hydrocarbons (kerosene, petrol, etc).</p>		<p>CNS toxicity: Volatile petroleum distillates and halogenated hydrocarbons may rapidly attain a high concentration in the CNS and suppress the central ventilatory drive. The other acute effects include coma and seizures. Some compounds may produce initial euphoria, agitation, hallucinations, tremors and seizures followed CNS depression.</p>		<p>30-100ml of kerosene or 15-20ml of benzene.</p>	

			<p>Systemic toxicity: This includes hepatic and renal damage (carbon tetrachloride), renal failure (diesel fule), proteinuria and haematuria (turpentine), haemolysis and disseminated intravascular coagulation (gasoline), myocardial injury, cardiac arrhythmias, rhabdomyolysis and myoglobinuria.</p> <p>Metabolic effects: These include hypokalaemia, hypophosphataemia and metabolic acidosis.</p> <p>Other effects: An intramuscular injection of lighter fluid may lead to marked cellulites and crepitus indicating vaporization of lighter fluid.</p>			
c) Paracetamol	Antipyretic and mild analgesic.	<p>Paracetamol toxicity can be divided into four clinical stages.</p> <p>Stage one occurs between 12-24 hours after ingestion and is characterized by nausea, vomiting, diarrhea, anorexia, pallor and diaphoresis.</p> <p>Stage two occurs 24-48 hours after ingestion. While the patient is clinically improved, the SGOT, SGPT, bilirubin and prothrombin time increase during this stage.</p> <p>Stage three occurs 48-96 hours after ingest after ingestion, Peak hepatotoxicity occurs during this phase. Acute renal failure and myocardial pathology may also occur.</p> <p>Stage four occurs 7-8 days after ingestion during which recovery occurs.</p> <p>Besides the above-mentioned features, patients may develop lactic acidosis, hypoglycaemia and hypophosphataemia. Myocardial damage, necrosis and fatty degeneration rarely occur but may happen as late</p>	<p>Perform a gastric lavage and administer activated charcoal (effective up to 2-4 hrs).</p> <p>Draw blood for acetaminophen levels four hours post-ingestion .if the blood level for cannot be performed in a timely manner , institute treatment which can be terminated if the blood level is below the nomogram line . A four -hour level of 150ug/ml or greater is an indication to begin theraph with N-acetylcysteine. Subsequent blood levels that may fall below the line are not an indication to terminate treatment. If the initial level is an eight-hour level, then a level of 75ug/ml or greater is an indication to start treatment with N-acetylcysteine. Likewise, an initial acetami-nophen level at twelve hours of 37.5ug/ml is an indication to begin therapy with N-acetylcysteine.</p> <p>N- acetylcysteine as early as possible. In any case, do not delay its use beyond thirty-six hours of ingestion.</p> <p>If oral charcoal has been given earlier, lavage the stomach to clear it before administering the first dose of N- acetylcysteine. If multiple dose activated charcoal is being used</p>	140mg/kg or 10gm in adult.	2-4 days.	

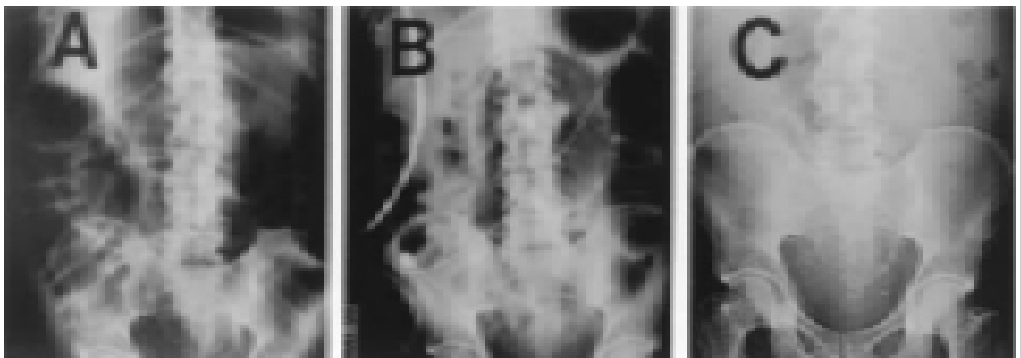
<p>in two weeks after ingestion.</p> <p>Other features which can occur are acute renal failure without liver damage, acute pancreatitis (1-2 days after ingestion) and coma within a few hours if a large dose has been ingested.</p> <p>Dark brown urine in some patients is another feature of paracetamol poisoning.</p> <p>Paracetamol overdoses in children present a slightly different picture as compared to toxicity in adults. Children with very high levels of paracetamol usually show only minor elevations in serum liver enzymes. Also, children tend to vomit spontaneously quite early in the course of an ingestion which limits toxicity.</p>	<p>because of coingestion, then alternate N-acetylcysteine and charcoal with at least a two-hour interval between the two. Again, lavage charcoal from the stomach prior to each N-acetylcysteine dose.</p> <p>Prepare N-acetylcysteine as a 5 per cent solution in grape fruit juice or a cola beverage as it tastes and smells terribly. If the patient vomits within one hour of its administration, repeat the dose. If emesis becomes a constant problem, pass a weighted tube such as the Miller-Abbott tube and instill the drug directly into the duodenum. If available, use an intravenous preparation in place of an oral solution.</p> <p>The initial dose of oral N-acetylcysteine is 140mg/kg and each subsequent dose is 70mg/kg every four hours for another seventeen doses. The side effects include a rash, vomiting, hypotension and mild bronchospasm.</p>
<p>Toxic symptoms of chloroquine poisoning are usually noted within 1-3 hours of ingestion.</p>	<p>Cimetidine may be of some value if N-acetylcysteine is not available.</p>
<p>Neurological features</p>	<p>Forced diuresis and haemodialysis are of little use. Exchange transfusion may be of some value in infants.</p>
<p>Drowsiness is often the earliest feature and may appear within 10-30 minutes of an overdose.</p>	<p>Monitor the liver and renal functions every day.</p>
<p>Other features are headache, photophobia, diplopia, restlessness and seizures. Seizures usually precede circulatory arrest. Visual disturbances including a hurring of colour vision, and sometimes blindness (transient) are often seen.</p>	<p>Institute supportive treatment.</p> <p>Carry out gastric emptying in the early phases of intoxication. However, the patient must be intubated before this because of the possibility of sudden cardiac arrest. Use ipecac in very early stage only. Because of the rapid absorption of the drug, gastric emptying is futile if symptoms have already appeared. However, if the patient has ingested chloroquine on a full stomach, drug absorption is slowed and therefore, gastric emptying can be performed in later stages also.</p>
<p>Gastrointestinal features</p>	<p>For shock or widened QRS complexes, use isoprenaline and dopamine; administer sodium lactate when an ECG shows intraventricular conduction defects.</p>
<p>These include nausea, vomiting and epigastric distress.</p>	<p>It has not been established whether hypokalaemia in chloroquine poisoning should be corrected. Avoid potassium in the early stages when cardiac failure and/or conduction defects occur. In the case of an abnormal stimulus formation such as ventricular extrasystoles and torsades de pointes which occur mainly during the second phase (after eight hours), potassium may be</p>
<p>Respiratory features</p>	
<p>Rapid breathing (often early in the poisoning), sudden apnoea and respiratory failure can occur.</p>	
<p>Cardiovascular features</p>	
<p>Chloroquine produces vasodilatation and hypotension. A sudden fall in blood pressure is very characteristic. The main cause of hypotension is the cardio-depressant effect of chloroquine rather than its vasodilatory effects. ECG findings include widening of QRS complexes, flattened or inverted T waves, prolonged QT interval, depression of the</p>	

e)	<p>Antimalarial Agents</p> <p>i) Chloroquine</p>	<p>ST segment and prominent U waves; AV blocks are less common. In cases of severe intoxication, cardiovascular features promptly follow the appearance of the initial symptoms. However, cardiac arrest can also be the first manifestation. Ventricular tachycardia and fibrillation are observed during the initial period of intoxication whereas ventricular extrasystoles and torsades de pointes occur mainly after eight hours of ingestion.</p> <p>Other features:</p> <p>Hypokalaemia is almost always present in severe chloroquine poisoning. It appears early (within three hours of ingestion) and is because of the intracellular shift of potassium. As chloroquine is eliminated from the body over a few hours, the administration of potassium to correct mild hypokalaemia may lead to sudden hyperkalaemia.</p> <p>In rare cases, chloroquine intoxication may lead to deafness.</p> <p>Nausea, vomiting, tinnitus, dizziness, headache, vertigo.</p> <p>ECG changes occur as late as 24-36 hours. Prolongation of PR and QT intervals are seen. Ventricular arrhythmias may occur in rare cases. In severe cases of intoxication patients develop hypotension and convulsions leading to death. Patients may develop hypokalaemia and hypoglycaemia.</p> <p>Nausea, flushing, chills, tachycardia, hypertension, piloerection. Pupils are invariably dilated. Visual illusions, sound magnification and distortion. Panic attack, Hyperthermia, bleeding dilators. Tremor, ataxia, convulsion, coma.</p> <p>Lethargy, euphoria, hallucinations violent</p>	<p>a useful agent.</p> <p>Diazepam is useful for ventricular arrhythmias, cardiac arrest and shock. Administer a loading dose of 1 mg/kg followed by an infusion at a total dose of 1 mg/day per 30mg of chloroquine ingested OR a loading dose of 0.5mg/kg and then an infusion of 0.1mg/kg/day per 100mg of chloroquine ingested. Continuous infusion may be required for forty-eight hours.</p> <p>It has been seen that a combination of early mechanical ventilation with the administration of diazepam and epinephrine (0.25µg/kg/minute gradually increased to obtain a systolic B.P. of 100mg) may be effective in treating severe chloroquine poisoning.</p> <p>Peritoneal dialysis, haemodialysis and haemoperfusion are useless.</p> <p>Perform a gastric lavage and administer activated charcoal. The use of a solution of potassium permanganate (1:10,000) as lavage fluid is useful. Treat hypotension with fluids and intravenous sympathomimetics. Treat cardiac toxicity with lidocaine, phenytoin or</p>	<p>2gm in adults and 35-50mg/kg in children.</p>	<p>24 hours.</p>
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			behaviour, cattonia, nystagmus, hypertension, hyperthermia tachycardia, rigidity, sweating, seizures, coma, muscular hyperactivity and self destructive behaviour.	temporary pace maker. Correct hypokalaemia and hypoglycaemia.	
			Blurred vision, dry mouth, sinus tachycardia, constipation, urinary retention and decreased sweating. Sedation, drowsiness and hypotension. Postural hypotension, lightheadness and reflex tachycardia. Sinus tachycardia, prolonged QTc interval, prolonged PR and QRS intervals, blunt T waves and depression of the ST segment. Rigidity, dystonia, dysarthria and akathasia. Neutropaemia developing within forty-eight hours, renal failure due to rhabdomyolysis (secondary to seizures) or hypotension, neuroleptic malignant syndrome (fever, altered mental status, autonomic dysfunction, movement disorders), pulmonary oedema (ARDS, more common with phenothiazine overdose), and delayed hypertension occurring 36-48 hours after ingestion.	Low dose of anti-anxiety drug and benzodiazepines. Quiet and secluded environment. Supportive measures. Psychiatric follow up.	
	ii) Quinine	Initially marketed for veterinary use as anaesthetic agent, but it soon became popular as an inexpensive illicit drug in America.		Gastric lavage is performed within 2 hours of ingestion. Other measures similar as amphetamine poisoning.	
f)	Hallucinogens/			Mainly supportive management is required. Gastric lavage. Infuse fluid rapidly to correct hypotension. If no response to fluids, norepinephrine is recommended. Sodium bicarbonate may be useful in managing ventricular dysarrhythmias. In rare cases, CNS depression may respond to naloxone. Bromocriptine has also been used successfully.	8gms for adults and 20mg/kg for children.
g)	Psychedelics :				About 14mg.
	i) LSD (lysergic acid Diethylamide)	In the treatment of psychosis.			
	ii) Phencyclidine				
	iii) Anti psychotics (chlorpromazine, promazine, Trifluoperazine, Haloperidol, molindone etc).				150-200mg.

Chapter XI

ORTHOPAEDICS



SOME IMPORTANT POINTS TO BE NOTED

1. Massage in acute trauma is contraindicated.
2. Referring a fracture case without immobilization is dangerous.
3. GENERATE AWARENESS AGAINST indigenous and quackery treatment.
4. Delayed treatment / NEGLECTED FRACTURE give poor result
5. POLYTRAUMA, PELVIC FRACTURE AND longbone fracture should be sent with IV fluid.
6. stabilize a critical patient before referral.
7. Tight bandage, slab, cast should be avoided.
8. Cases with suspected spinal cord injury or vertebral fracture should be transferred in lying position on a spinal board, stracher with cervical or lumber belt.
9. THOROUGH WOUND WASH,LIGATING bleeders AND SPLINTAGEIS MUST BEFORE REFERRING A CASE OF OPEN FRACTURE / EXTENSIVE LACERATED WOUND.
10. In poly trauma head, chest and abdominal injuries should be searched for and refer red accordingly.

GENERAL PRINCIPAL OF FRACTURE TREATMENT

Evaluate the general condition, Relief pain , Immobilized the fracture site (closed), wash and control bleeding (open fracture AND EXTENSIVE LACERATION), x-ray if facility available, un displaced fracture can be treated only by POP slab , immobilization along with medication. Displaced fracture requires reduction AND fixation,EITHER OPEN CLOSED, therefore needs referral. Tet.Toxoid , immunoglobulin and parenteral antibiotic should be given in case of open and badly contaminated fracture or in case of extensive laceration. Stiffness after fracture treatment is an unavoidable sequelee and requires physiotherapy .

TECHNIQUE OF APPLICATION OF POP SLAB

1. Hold the injured limb carefully
2. Take direct measurement for required length
3. Wash the skin and/or cover the wound with sterile gauge
4. Apply antifungal powder or moisturizing cream
5. Cover the limb with cotton pad uniformly
6. Make not less then 9 layers of pop
7. Hold both the end with both hand and dip into water
8. Keep for 10 seconds or till bubbles comes out
9. Rinse out extra water slowly and keep over the desired part of the limb
10. Fix with cotton bandage.

FOR MLC CASES NOTE THE FOLLOWINGS

- FULL PARTICULARS OF THE PATIENT
- BROUGHT BY WHOM
- TIME OF INJURY
- MODE OF INJURY
- DESCRIPTION OF INJURY
- SITE AND SIDE OF INJURY

FRACTURES OF THE LOWER LIMBS

- Fracture shaft of femur in adults
- Asses the general condition (including Neuro Vascular status of distal part)
- Relieve pain, start an IV drip
- X-ray and teleconsultation through telemedicine
- Apply surface traction
- Splint the limb by indigenous splint if Thomas splint is not available
- In case of open fracture ,wash ,control bleeding and dress the wound then immobilize .
- Give an antibiotic ,TT and / or TT immunoglobulin (Tetglobe,Tetagram)
- Refer the case after stabilizing general condition

Fracture shaft femur in children

- Asses the general condition (including distal Neuro Vascular status)
- Relieve pain start an IV drip if needed
- Take X-ray and discus through telemedicine
- Simple un displaced fracture with good general condition: - splint the limb and maintain for 6 to 8 weeks along with medication. See that ant.sup. iliac spine, center of patella and 2nd toe are on same line (till bony union).
- If fracture is displaced or open and general condition is not favorable: - Refer the case.

Fracture both bone leg in adults

- Asses the general condition & Neuro Vascular status and relieve pain
- If open fracture wound care and antibiotic(Antibiotics Broad Spectrum covering Gm positive & negative Bacteria and for anaerobic bacteria through I.V.) with TT and / or TT immunoglobulin .
- Support the fracture immobilizing the leg including knee and ankle

(long leg casts)

- Take a X-ray and discuss through Telemedicine
- Refer the case for further management

FRACTURE AROUND ANKLE

- Pain relief, wound care (if compound fracture)
- Splint the limb by below knee POP slab
- Refer the case with immobilization

METATARSAL FRACTURE

- If un displaced, immobilize by below knee POP slab for 3 weeks followed by physiotherapy (hot compress, exercise and wax bath etc)
- If fracture is open wound care with antibiotic, TT etc

FRACTURE OF TOES

- Strapping of injured toe with adjacent toe for 3 weeks
- If fracture is open wound care with antibiotic, TT etc along with immobilization

FRACTURE OF PATELLA

- Relieve pain, care of wound (if open fracture) along with antibiotics, TT etc.
- Un displaced (less than 2mm gap and patient can do SLR):- POP cylindrical slab for 4 to 6 weeks followed by physiotherapy (active quadriceps exercise, hot compress and wax bath etc)
- Displaced fracture: - To be referred after pain relief, wound care (in open fracture) and cylindrical slab (POP slab from upper thigh to above ankle)

FRACTURE AROUND KNEE

- Assess the extent of damage, relieve pain, improve general condition
- In close and un displaced fracture immobilization by POP Slab above knee for 4 to 6 weeks followed by PTB cast till radiological sign of union is seen
- Open and displaced fracture should be referred after AK POP slab (wound care in open fracture must)

FRACTURE UPPER FEMUR (NECK,INTERTROCHENTERIC AND SUB TROCHENTERIC)

- Relief pain, Stabilise general condition, search for any pre existing medical problem
- Surface traction and splintage over Thomas splint
- X-ray and teleconsultation
- Refer for further definitive treatment after general condition is stable

PELVIC FRACTURE

- Asses general condition
- Correct shock and transfuse blood / volume expander
- Catheterize, continue IV line
- Apply pelvic compression bandage before transportation
- Refer the case after general condition is stable (in proper Department Surgery/ Orthopaedics)

EXTENSIVE LACERATED WOUND WITHOUT FRACTURE

- Wash with plenty normal saline, remove all foreign body
- Control bleeding, close the wound with a few stay suture
- Splint the limb and keep limb elevated
- TT, TT immunoglobulin, antibiotics and supportive (Broad Spectrum Antibiotics Gm positive & Gm negative Bacteria and Metrogyl i.v.)
- Reassess the general condition and refer if patient needs further treatment

FRACTURE OF UPPER LIMBS

FRACTURE SCAPULA

- If diagnosis is confirmed by X-ray and fracture is un displaced one apply arm chest strapping with neck sling and continue for 3 to 6 weeks followed by physiotherapy if shoulder is stiff.
- Cases with associated injuries elsewhere and unconfirmed diagnosis should be referred with arm chest strapping.

FRACTURE SURGICAL NECK OF HUMERUS

- Relief pain, x-ray if available
- Arm Chest strapping and neck sling to immobilise the fracture site
- Undisplaced fractures-continue strapping for 3(three) weeks along with medication.

- Displaced fractures- refer for operation (Close reduction or Open Reduction Internal Fixation).
- Physiotherapy for post immobilization stiffness.

FRACTURE SHAFT OF HUMERAS AND FRACTURES AROUND ELBOW

- Relief pain and immobilize the fracture site including one joint proximal and one joint distal (U – slab for # humeral shaft and AE slab for # around elbow)
- For un displaced and uncomplicated fractures , continue immobilization along with medication and have a teleconsultation.
- Open fractures-immobilize after wound care, give antibiotic, TT etc and refer .
- Displaced fractures- refer after immobilizing the fracture site by either POP slab or Indigenous splint.

FRACTURE BOTH BONE FOREARM

- Open and displaced fracture should be referred after pain relief, antibiotics and above elbow POP slab.
- Simple Undisplaced fracture-immobilisation by above elbow POP slab for 4 – 6 weeks in children & 6 to 8 weeks in adult followed by physiotherapy.

SUPRACONDYLER FRACTURE IN CHILDREN

- Open and displaced fracture and pulse less (Radial) should be referred after pain relief, antibiotics and above elbow POP slab.
- Simple Undisplaced fracture - immobilisation by above elbow POP slab for 4 – 6 weeks followed by physiotherapy.

COLLE'S FRACTURE

- Displaced fracture should be referred after pain relief and Colle's slab or indigenous splint for closed reduction under GA.
- Simple Undisplaced fracture - immobilisation by Colle's slab for 4 – 6 weeks followed by physiotherapy.

FRACTURE OF METACARPAL

- Open and displaced fracture should be referred after pain relief, antibiotics and cock up POP slab.
- Simple Undisplaced fracture - immobilisation by cock up POP slab for

3 weeks followed by physiotherapy.

PHALANGEAL FRACTURES

- Strap the fractured finger with adjacent finger and keep for 3 weeks along with symptomatic medication. Exercise and hot compress for post immobilization stiffness.

BONE INFECTION

ACUTE OSTEOMYELITIS

Early stage

- Rest, pain relief, rest to the affected limb, I.V Broad Spectrum Antibiotics covering Gm positive & Gm negative Bacteria till afeverile then antibiotics as per C&S report through I.V./Oral route.
- Teleconsultation
- Refer if no improvement
- Drainage where facilities for operation under general anaesthesia is available.
- Proper oral antibiotics for 6 weeks.
- After Initial management refer.

LATE STAGES

- With poor GC, septicemia and cases requiring surgical intervention should be referred immediately

SEPTIC ARTHRITIS

- Routine blood test, X-ray, C/S of aspirate
- Parenteral antibiotic (I.V. Broad Spectrum covering Gm positive & Gm negative Bacteria & considering age group and supportive Rx
- Referral to a higher centre after POP slab/ immobilization on a splint if major joint is involved or drainage is not possible.
- Pus for culture and sensitivity followed by proper antibiotic through I.V then Oral.

CHRONIC OSTEOMYELITIS

- Characterized by discharging or healed sinus, sequestrum and may require surgical intervention hence refer.

GOUTY ARTHRITIS

- Hyperuricaemia is the cause.
- *Diagnosis*- sudden attack of intense joint pain with minor trauma, alcohol consumption, attack at late hours of night.
- Metatarsophalangeal joint of great toe, ankle, finger joints commonly affected.
- Skin over the joint is red hot and tender.
- Analgesic (Diclofenac / Indomethacin) Rest of the joint
- Anti- hyperuricemic drug- Zyloric 300 mg,/ Febuxostat 40mg/80mg (continue treatment with titrating doses as per serum uric acid level) along with dietary advice & lifestyle modification

DEGENERATIVE DISEASES

- Cervical spondylosis and lumber spondylosis
- Assure that it's a problem of aging process and may be secondary to trauma etc
- No massage, Use low pillow, Hot compress and exercise(Please do Teleconference with patient)
- Avoid journey, forward bending, and weight lifting.
- NSAID with Muscle relaxant and supportive medication.
- In acute pain Cervical/ Collar(Hard Collar) /L.S. Brace & rest in Bed for 7 days.

CERVICAL SPONDYLOSIS AND LUMBER SPONDYLOSIS WITH RADICULOPATHY

- To above add methylecobalamine and pregabalin (50mg/75mg/ 100mg/150mg, sustained release) combination one at bed time at 2-3 months.

TENIS ELBOW, DEQUIRVAN DISEASE, FIBROMAYALGIA, CALCANIAL BURSITIS, PLANTER FASCEITIS

- If physiotherapy and symptomatic medication do not respond send the patient for evaluation and/or local steroid injection.

DISLOCATION OF JOINTS

- Surgical emergency & requires closed reduction under GA
- Relief pain, support the limb and refer if anesthetic facility is not available or reduction could not be achieved.

- Refer should be as early as possible.

SPINAL FRACTURES

- Keep high index of suspicion in polytrauma , RTA and fall from height
- Don't move the patient unnecessarily
- Support the spine rigidly and ensure immobilization during transport
- Spine board or spinal brace may be used
- Catheterize the bladder
- Look for associated injuries (Cervical Injury associated with head injury)
- Simple fractures without any neurodeficit requires bed rest(10/12 weeks), medication and closed observation and prevent complications like bed sore, lungs infections, Urinary infaction etc.
- Complicated cases should be referred for further evaluation.
- Spinal fracture & Neurological complication to be refered in proper centre.

Chapter XII

**OBSTETRICS
&
GYNAECOLOGY**



Post Menopausal Bleeding

Def: - Bleeding per vagina following established menopause is called post menopausal bleeding.

It should not be underestimated as in one third of the cases are due to malignancy.

Causes: -

- i. Endometrial atrophy most of the cases.
- ii. Endometrial hyperplasia.
- iii. Endometrial Polyp.
- iv. Estrogen (hormone) replacement therapy.
- v. Genital malignancy-carcinoma of cervix, endometrium, vagina, vulva & fallopian tube.
- vi. Decubitus ulcer in case of U-V prolapse.
- vii. Retained and forgotten pessary or IUCD.

Investigations: -

- i. *Detailed history* –
 - a) Age of menopause, menstrual history prior to it
 - b) Intake of HRT
 - c) H/O prolapse
- ii. *General examination* –
 - a) Breast exam, Lymph nodes exam.
 - b) P/A exam.
 - c) P/S & P/V exam.
- iii. *Endometrial sampling* –
 - a) Biopsy
 - b) Fractional Curettage
- iv. *Special investigations* –
 - a) Ultrasonography (S/S)
 - b) Hysteroscopy
- v. *Endoscopy*
- vi. CT & MRI in selected cases
- vii. *Treatment* –
 - a) According to cause.
 - b) If no cause is found – Careful observation for further episode of bleeding P/V
 - c) In case of recurrent or continued bleeding it is better to perform complete surgery with pan hysterectomy and subsequent

histopathology examination for probable cause.

Bleeding in early pregnancy

It could be due to following causes:-

- i. Spontaneous abortion.
- ii. Hydatiform mole.
- iii. Ectopic pregnancy.

Abortion

- Threatened
- Inevitable
- Incomplete
- Complete
- Missed
- Septic

Symptoms

- History of amenorrhoea
- Vaginal bleeding
- Abdominal pain

Investigation

- Blood Grouping & Rh typing
- Hb %
- USG – Pelvis

Hydatiform mole:-

This is an abnormal pregnancy where the chorionic villi are transformed into a mass of translucent vesicles resembling grape like structures.

Symptoms:-

- Amenorrhoea
- Recurrent blood stained discharge or frank haemorrhage per vagina
- Expulsion of grape like vesicles
- Nausea / Excessive vomiting

On examination:-

- Pallor & tachycardia
- P/A: Large for dates uterus, it may be normal or small for dates
- Soft cystic or doughy uterus
- Fetal parts are not palpable

Investigation:-

- Confirmation by ultrasonography
- Management – Refer to higher center

Ectopic pregnancy:-

Pregnancy occurs outside uterine cavity.

Symptoms:-

- Amenorrhoea
- Sudden agonizing pain abdomen
- Vaginal bleeding or dark colour discharge
- Fainting attack

Signs:-

- Sign of severe anemia & shock ie- Pallor, sweating, cold clammy skin, tachycardia, hypotension
- Tenderness in lower abdomen
- P/V – Cervical movements are painful, a soft fluctuating tender mass may be felt in posterior or lateral fornix

Investigation:-

- Hb %
- Blood grouping & Rh typing
- USG- pelvis

Management:-

- Management of shock
- Refer to higher center

TYPES OF ABORTIONS

SL. No.	SYMPTOMS	THREATENED	INEVITABLE	INCOMPLETE	SEPTIC	MISSED	COMPLETE
a)	History of amenorrhoea	Present	Present	Present	Present	Present	Present
b)	Vaginal bleeding	Scanty bright red or blood stained discharge	Frank bleeding, it may be severe at times	Continuous or recurrent bleeding	Foul smelling discharge	Nil or dirty brown or sanguineous discharge	May be present
c)	Abdominal pain	Commonly absent or slight, vague pain on back and lower abdomen	Severe colicky pains in the lower abdomen	Abdominal pain may or may not be present	Pain may or may not be present. Later on, with spread	Pain is absent	Present

					of infection to the pelvic peritoneum, severe pain the lower abdomen		
d)	History of expulsion of the product of conception per vagina	Nil	Nil	Present	May or may not be present	Present	Present
e)	Constitutional symptoms	Nil	May be present. Tachycardia, low BP in case of heavy blood loss.	In severe blood loss, Tachycardia, pallor, low BP, symptoms of shock may be present.	Fever with chill is present, nausea vomiting may be present, oliguria.	Absent	Absent
f)	Signs Uterus Size	Corresponding Period of gestation	May be corresponding	Smaller than period of gestation	May be small with tenderness	Smaller than gestation	Smaller than period of gestation and Os closed
	Status of internal Os.	Closed	Open	Open in recent and closed in old	May be closed	Os closed	
g)	Character of vaginal discharge	Scanty bleeding	Frank blood and clots	Recent or old blood(dark brown)	Foul smelling purulent puslike discharge may be present	Thin brown or serosanguinous discharge may be present	Scanty Fresh bleeding Or No bleeding
h)	Complications	May become Inevitable or missed abortion	May become complete abortion, develop haemorrhage shock, may become septic if handled by untrained persons,	May become septic abortion, can develop anaemia	Maternal death, renal failure, endotoxic shock, septicemia, DIC	Coagulation failure	No complication if no interference
i)	Investigations	Hb, urine for albumin and sugar	Hb, urine for albumin and sugar	Hb, urine for albumin and sugar	Hb, urine for albumin and sugar, DLC, TLC	Hb, urine for albumin and sugar. BT, CT, CRT If the uterus is <10	Hb%, urine for alb. and sugar

j)	Treatment	Bed rest, abstinence, folic acid (1 mg) daily. Reevaluation after 4 weeks or earlier in case of increased bleeding per vaginum or pain in lower abdomen.	Resuscitation with IV fluids, evacuation of the uterus by suction Evacuation, Injection Ergometrine 0.2mg Iv followed by check curettage. If uterus is more than 12 weeks and bleeding is severe, start syntocinon drip and refer to FRU.	Section curettage is to be done if the external OS is open. Dilatation of cervix followed by blunt curettage is to be done if external OS is closed. If the uterus is more than 12 weeks then refer to FRU as in inevitable abortion.	Hospitalize the patient. Start Metronidazole, Ampicillin, Gentamicine, parenterally, if the OS is open, uterus is <10 weeks then evacuate after 24 hours of antibiotics or earlier if she bleeds. No curettage, only digital evacuation is to be done. Monitor for complication and refer accordingly	weeks size then suction evacuation may be done. If more than 10 weeks patient to be referred to FRU	No treatment is required if you have inspected the products. If not sure of the completeness, do curettage (dilatation may not be required)
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Management of Vaginal Discharge in Females

Dr Jayanta Ray Assoc Prof ,AGMC

VAGINAL DISCHARGE

VAGINITIS TRICHOMONIASIS CERVICAL HERPES CERVICITIS

Causative Organisms: Vaginitis

1. Trichomonas vaginalis (TV)
2. Candida albicans
3. Gardnerella vaginalis, Mycoplasma causing bacterial vaginosis (BV)

Causative Organisms :Cervicitis

1. Neisseria Gonorrhoeae
2. Chlamydia trachomatis
3. Trichomonas vaginalis
4. Herpes simplex virus

History

- Ø Menstrual history to rule out pregnancy
- Ø Nature and type of discharge (amount, smell, color, consistency)
- Ø Genital itching
- Ø Burning while passing urine, increased frequency
- Ø Presence of any ulcer, swelling on the vulval or inguinal region
- Ø Genital complaints in sexual partners
- Ø Low backache

Examination

- Per speculum examination to differentiate between vaginitis and cervicitis.

a) Vaginitis:

- Trichomoniasis -greenish frothy discharge
- Candidiasis- curdy white discharge
- Bacterial vaginosis – adherent discharge
- Mixed infections may present with atypical discharge

b) Cervicitis:

- Cervical erosion /cervical ulcer/mucopurulent cervical discharge
- Bimanual pelvic examination to rule out pelvic inflammatory disease
- If Speculum examination is not possible or client is hesitant treat both for vaginitis and cervicitis

Laboratory Investigations (if available)

- Ø Wet mount microscopy of the discharge for Trichomonas vaginalis and clue cells
- Ø 10% KOH preparation for Candida albicans
- Ø Gram stain of vaginal smear for clue cells seen in bacterial vaginosis
- Ø Gram stain of endocervical smear to detect gonococci

Treatment

Vaginitis (TV+BV+Candida)

●Tab. Secnidazole 2gm orally, single dose or Tab. Tinidazole 500mg orally, twice daily for 5 days (Tab. Metoclopramide to be taken 30 minutes before Tab. Secnidazole, to prevent gastric intolerance)

●Treat for candidiasis with Tab Fluconazole 150mg orally single dose or local Clotrimazole 500mg vaginal pessaries once

Treatment for cervical infection (chlamydia and gonorrhea)

●Tab Cefixim 400 mg orally, single dose + Azithromycin 1 gram, 1 hour before lunch. If vomiting within 1 hour, give antiemetic and repeat

●If vaginitis and cervicitis are present treat for both · Instruct client to avoid douching

●Pregnancy, diabetes, HIV may also be influencing factors and should be considered in recurrent infections

●Followup after one week

Management in pregnant women

Per speculum examination should be done to rule out pregnancy complications like abortion, premature rupture of membranes

Treatment for vaginitis (TV+BV+Candida)

In first trimester of pregnancy

●Local treatment with Clotrimazole vaginal pessary/cream only for candidiasis. Oral Fluconazole is contraindicated in pregnancy.

●Metronidazole pessaries or cream intravaginally if trichomoniasis or BV is suspected.

In second and third trimester- oral metronidazole can be given

●Tab. Secnidazole 2gm orally, single dose or Tab. Tinidazole 500mg orally, twice daily for 5 days

●Tab. Metoclopramide taken 30 minutes before Tab. Metronidazole, to prevent gastric intolerance

Specific guidelines for partner management

- Treat current partner only if no improvement after initial treatment
- If partner is symptomatic, treat client and partner using above protocols
- Advise sexual abstinence during the course of treatment
- Provide condoms, educate about correct and consistent use Schedule return visit after 7 days

Management of Lower Abdominal Pain in Females

Dr Soumitra Majumder (Asst Prof) AGMC

SYNDROME: LOWER ABDOMINAL PAIN

Pelvic inflammatory disease

Causative Organisms

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- *Mycoplasma, Gardnerella, Anaerobic bacteria (Bacteroides sp, gram positive cocci)*

History

- Lower abdominal pain
- Fever
- Vaginal discharge
- Menstrual irregularities like heavy, irregular vaginal bleeding
- Dysmenorrhoea
- Dyspareunia
- Dysuria, tenesmus
- Low backache
- Contraceptive use like IUCD

Examination

- General examination: temperature, pulse, blood pressure
- Per abdominal examination: lower abdominal tenderness or guarding
- Pelvic examination: Uterine/adnexal tenderness, cervical movement tenderness,
- Per speculum examination: vaginal/cervical discharge, congestion or ulcers

Note: A urine pregnancy test should be done in all women suspected of having

PID to rule out ectopic pregnancy

Laboratory Investigations If available

- Wet smear examination
- Gram stain for gonorrhea
- Complete blood count and ESR
- Urine microscopy for pus cells

Differential diagnosis

- Ectopic pregnancy
- Twisted ovarian cyst
- Ovarian tumor
- Appendicitis
- Abdominal tuberculosis

Treatment (Out Patient treatment)

In mild or moderate PID (in the absence of tubo ovarian abscess), out patient treatment can be given. Therapy is required to cover Neisseria gonorrhoeae Chlamydia trachomatis and anaerobes.

● **Tab. Cefixim** 400 mg orally BD for 7 days + Tab. Metronidazole 400mg orally, twice daily for 14 day + **Doxycycline**, 100mg orally, twice a day for 2 weeks (to treat chlamydial infection) + **Tab. Ibuprofen** 400mg orally, three times a day for 3-5 days + **Tab. Ranitidine** 150mg orally , twice daily to prevent gastritis + Remove intra uterine device, if present, under antibiotic cover of 24-48 hours

● Advise abstinence during the course of treatment and educate on correct and consistent use of condoms

Observe for 3 days.

Refer for inpatient (Hospital) treatment:

- If no improvement (i.e. absence of fever, reduction in abdominal tenderness, reduction in cervical movement, adnexal and uterine tenderness
- if symptoms worsen,
- Caution: PID can be a serious condition. Refer the client to the hospital if she does not respond to treatment within 3 days and even earlier if her condition

worsens.

Syndrome specific guidelines for partner management

1. Treat all partners in past 2 months
2. Treat male partners for urethral discharge (gonorrhoea and chlamydia)
3. Advise sexual abstinence during the course of treatment
4. Provide condoms, educate on correct and consistent use
5. Refer for voluntary counseling and testing for HIV, Syphilis and Hepatitis B
6. Inform about the complications if left untreated and sequelae
7. Schedule return visit after 3 days, 7 days and 14 days to ensure compliance

Management of Pregnant Women

Though PID is rare in pregnancy,

●Any pregnant woman suspected to have PID should be referred to district hospital for hospitalization and treated with a parenteral regimen which would be safe in pregnancy.

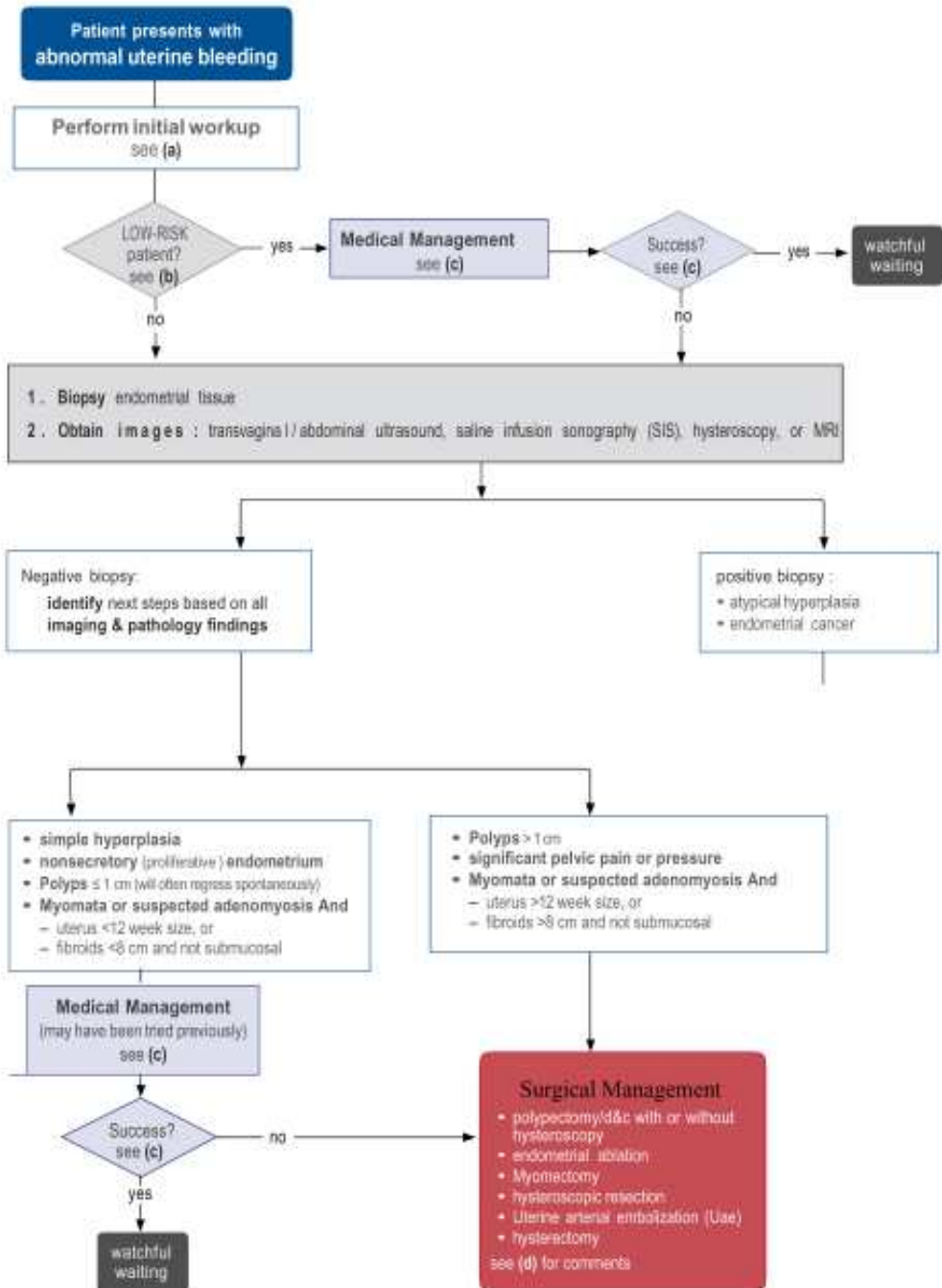
Doxycycline is contraindicated in pregnancy.

Metronidazole is generally not recommended during the first three months of pregnancy. However, it should not be withheld for a severely acute PID, which represents an emergency.

Hospitalization of clients with acute PID should be seriously considered when:

- The diagnosis is uncertain
- Surgical emergencies e.g. appendicitis or ectopic pregnancy cannot be excluded
- A pelvic abscess is suspected
- Severe illness precludes management on an outClient basis
- The woman is pregnant
- The client is unable to follow or tolerate an outClient regimen
- The client has failed to respond to outClient therapy
- Note: All Clients requiring hospitalization should be referred to the district hospital

Algorithm: management of abnormal uterine bleeding



► Notes on the algorithm ^{4,5,6}

(a) Initial work-up: Key activities and goals for initial visit(s)	
<p>Medical history: timing & quantity of bleeding, menstrual history including menarche and recent periods, associated symptoms, family history of bleeding disorders</p> <p>Physical exam: bimanual may reveal bulky uterus/ discrete fibroids</p> <p>Lab: pregnancy testing, pap smear, CBC, PT/PTT, possible cervical culture, TSH (t4 if abnormal)</p> <p>Consider ultrasound depending on AUB severity, patient's age, presence of fibroids</p>	<p>Rule out other causes of AUB:</p> <ul style="list-style-type: none"> —Pregnancy —Medications —Infection —Trauma —Coagulopathy —Extrinsic sources of bleeding —Systemic disease: hepatic, renal, leukemia, endocrinopathies (hypothyroidism, hyperprolactinemia, Cushings, PCOS, adrenal tumors, etc.)

(b) Identifying patients at lower risk for pathology
<p>Patients may be considered at LOWER risk for endometrial cancer if ALL of the following are true:</p> <ul style="list-style-type: none"> -Age <35 -NO findings (history, physical, or lab) suggestive of uterine/cervical pathology -NO risk factors such as obesity, hypertension, diabetes mellitus, PCOS, family history of breast or colon cancer, chronic anovulation, history of unopposed estrogen

(c) Medical management					
Success with medical management: Control of bleeding for 3 consecutive cycles (NO persistent bleeding for more than 8 days; NO profuse bleeding (e.g., large clots, gushes, significant limitations on activity); NO persistent anemia (Hct <30%, Hgb <10))					
Med category	type, name	dose	tier, est. cost*	use for ovulatory AUB	use for anovulatory AUB
estrogen and/or progestin	estrogen-progestin OC Zovia (Desulien equiv.), AprisTota (Desogen), Tri-Provera (Ortho Tri-cyclen Lo), Plevilin (Ortho-Cyclen)	1 tablet daily	Tier 1, \$ for all those listed at left	+43-53% ↓ in blood loss +First choice if short-term contraception desired +Ethinodiol >35 mcg more effective	+First choice if pregnancy is not desired
	LNG-IUD Mirena	inserted, replaced every 5 years	medical benefit copy (usually ~20%), \$\$\$\$	+86-97% ↓ in blood loss (97% achieved after 1 yr of use) +First choice if LONG-term contraception desired +Cost-effective in long-term	
	progestin norgestrel/levonorgestrel acetate (Aygestin) medroxyprogesterone (Provera)	+Aygestin: 2.5-10 mg 1x/day for 5-10 days +Provera: 5-10 mg 1x/day for 5-10 days	Tier 1, \$ for both listed at left	+32-50% ↓ in blood loss +Use is NOT superior to other medical treatments including NSAIDs +Second choice due to lower efficacy and adverse effects	+Second choice, but preferred in smokers age >35 or with risk of thromboembolism
	estrogen Promarin	+1.25 mg oral, may repeat every 4 hours for 24 hours, then 1.25 mg 1x/day for 7-10 days +25 mg IM/IV, may repeat in 6-12 hours as needed	non- Tier 2, \$ \$ \$ \$ +V, medical benefit copy (usually ~20%), \$\$\$\$		+First choice for acute severe bleeding episodes +Administered orally for outpatients, IV for hospital admit
anti-fibrinolytics aspirin	tranexamic acid (Lysteda)	1300 mg 3x/day for 5 days of the menstrual cycle Requires dose decrease (renal dose) if SCr >1.4	Tier 2, \$\$\$	+40-50% ↓ in blood loss +First choice if NO contraceptive desired +Caution: thrombosis, renal insufficiency	
NSAIDs	diclofenac (Voltaren)	50 mg 3x/day	Tier 1, \$	+Adjunctive therapy	
	ibuprofen (Motrin)	800 mg 3x/day	for all those listed at left	+Inexpensive and consistent (see above for details)	
	naproxen sodium (Anaprox)	275-500 mg every 6-12 hrs		+Caution: PUD/GERD, renal insufficiency, SAE, bleeding disorders, HTN, HF	

- Uterus <12 cm: global endometrial ablation
- Uterus >12 cm OR failed ablation: hysterectomy
- Myomata, submucosal (2 or fewer) and uterus <12 cm in length: hysteroscopic resection or hysterectomy
- Myomata, intramural or serosal: myomectomy or hysterectomy

With ablation, ensure that patients understand that ablation is NOT sterilization or a form of contraception — and that they must not become pregnant after ablation. (Consider recommending sterilization with ablation.) Use the patient education fact sheet referenced on page 4 of this CPM.

Discussion

Both endometrial ablation and hysterectomy provide satisfactory results for women with AUB that has not responded to medication. While almost one third of women having endometrial ablation will have reoperation within 5 years, hysterectomy is associated with more perioperative morbidity.

Transcervical resection of submucosal myomata is a safe and effective treatment for women with a normal uterine size and not more than two submucosal fibroids (procedure

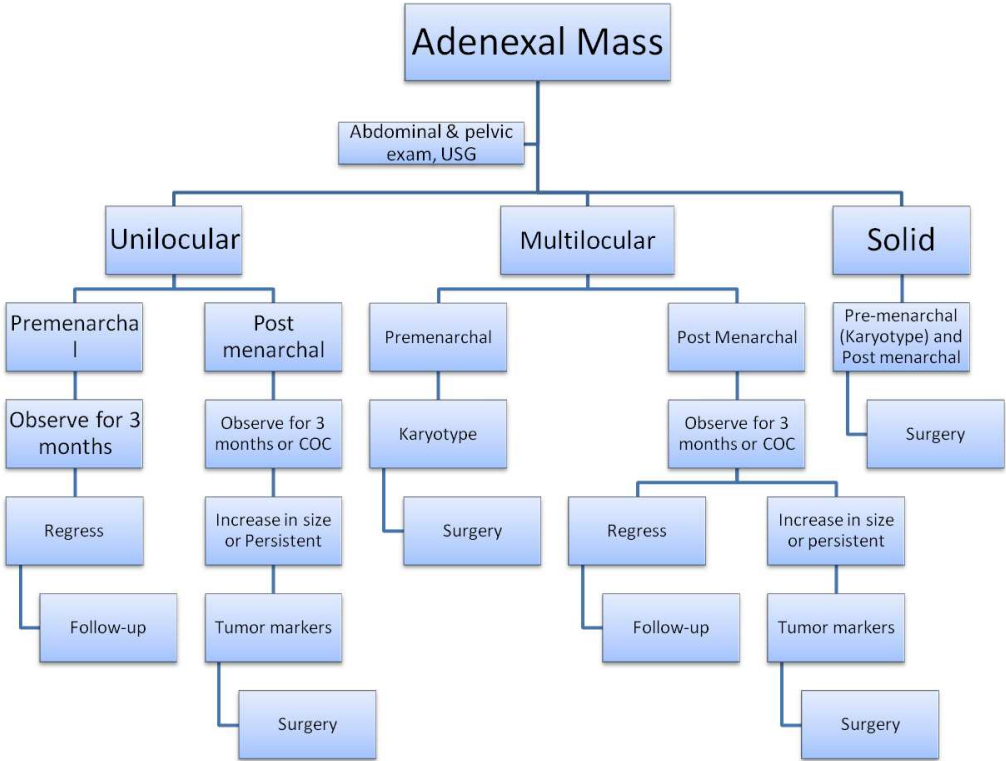
(d) Surgical management

Surgical intervention to treat abnormal uterine bleeding should be done only after imaging and endometrial sampling; surgery may be warranted when other treatment modalities have failed or when significant uterine anatomic abnormalities are present. The list below presents general recommendations for surgical treatment of possible causes/complications of AUB:

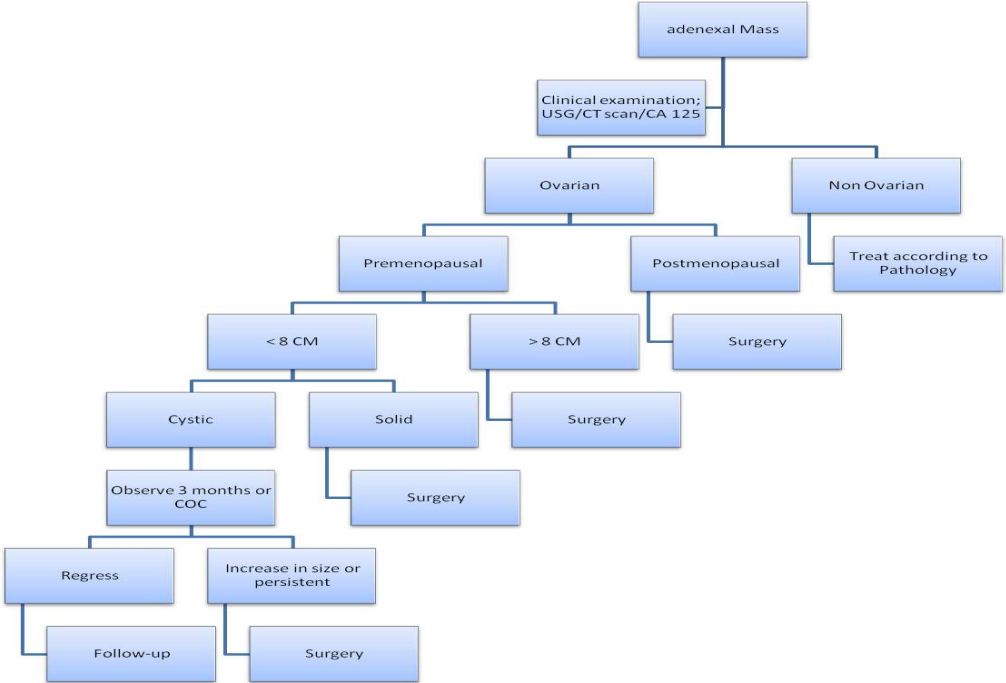
- Polyps:** polypectomy/D&C with or without hysteroscopy; consider combining with endometrial ablation
- * 2012 from SeedHealth: Tier outline
patient copay for 30-day supply: Tier 1 = \$6-16, Tier 2 = \$26-36, Tier 3 = \$65 or 25%. \$ symbol varies total (prescription cost copay + insurance copay) \$= <\$20, \$\$= ~\$25-\$30, \$\$\$= ~\$100, \$\$\$\$= ~\$250.

does not affect fertility).

New technologies to treat myomata include uterine artery embolization, MRI-guided focused ultrasonography, laparoscopic uterine artery occlusion, and cryomyolysis. Embolization appears to be effective for up to 5 years in reducing bulk symptoms and menorrhagia associated with myomata. However, the chance of reoperation for myoma-related symptoms within 5 years is 20% to 29%. The other modalities listed above are considered investigational and trial studies are ongoing.



Flow Chart: Management algorithm of pelvic masses in Adolescent girls



Flow Chart: Management algorithm for adnexal mass in premenopausal & postmenopausal woman

