Standard Treatment Approach

UTTAR PRADESH

2017

Uttar Pradesh Health System Strengthening Project

Suggested citation: Uttar Pradesh Health System Strengthening Project (UPHSSP). 2017. Standard Treatment Approach, Uttar Pradesh

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Sidharth Nath Singh
Minister of Medical & Health
Government of Uttar Pradesh

MESSAGE

Uttar Pradesh Health System Strengthening Project (UPHSSP), funded by World Bank, is undertaking several initiatives to improve the quality of services at different levels of health care facilities in Uttar Pradesh. One of the key initiatives of UPHSSP is the Development of 'Standard Treatment Approach' which will help in improving the quality of curative services in Government Health Facilities in the State.

This 'Standard Treatment Approach' document will help Government Medical Officers/ Specialists in providing treatment for 14 commonly occurring diseases/ health conditions at their facilities and further referrals. This will be helpful in providing standardized treatment to the common man, thereby reducing mortality and morbidity.

With these 'Standard Treatment Approaches' in place, I am hopeful that the State will sustain the momentum of improving health outcomes.

I congratulate the experts for their valuable contributions and officials of UPHSSP in developing the 'Standard Treatment Approach' for 14 diseases/ health conditions for the State.

Sidharth Nath Singh
Minister of Medical & Health
Government of Uttar Pradesh

Lucknow
July 2017

Dr. Mahendra Singh
Minister of State
Medical & Health
Government of Uttar Pradesh

MESSAGE

I am happy to share that the Uttar Pradesh Health System Strengthening Project (UPHSSP) with support from World Bank, has come out with the Standard Treatment Approaches for 14 most commonly occurring health problems/ conditions. In our resource- constrained setting, with high burden of disease, these Standard Treatment Approaches will be helpful in ensuring effective treatment to all and would ensure consistency and treatment efficacy for patients, across all sections of society.

I am sure that these Standard Treatment Approaches will enable the Medical Officers placed at all levels of public health facilities especially in rural areas, to follow the standard treatment procedures in treating patients and further referrals of the patients. These treatment approaches are an effort to optimise resources and provide quality care to population of the state.

I congratulate the experts, for their valuable contribution, and officers of UPHSSP in bringing out the Standard Treatment Approaches.

Dr. Mahendra Singh
Minister of State
Medical & Health
Government of Uttar Pradesh

Lucknow
August 2017

Prashant Trivedi (IAS)
Principal Secretary
Medical, Health & Family Welfare
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FORWORD

Uttar Pradesh Health System Strengthening Project (UPHSSP), with support from World Bank was launched in the year of 2012. The key objective of the Project is to improve the efficiency, quality and accountability of the health services delivered in Uttar Pradesh by strengthening the State's health Department management and systems capacity.

UPHSSP has undertaken several initiatives in improving the quality of care at the facilities. Development of 'Standard Treatment Approach' is one of the initiatives to improve the quality of curative services and referrals in Government Health Facilities. Drafted with support of health experts, this user friendly approach will be helpful in providing standard treatment to all the patients at all level of facilities and referrals.

This 'Standard Treatment Approach' is for 14 most commonly occurring diseases/ health conditions. The Standard Treatment Approach would be useful for Medical Officers placed at different level of Government Health facilities. It will improve the knowledge, skills and practices of Medical Officers. This book will also help in reducing referrals to District Hospitals and higher centers.

The Department of Health and Family Welfare appreciates this initiative of UPHSSP in formulating the 'Standard Treatment Approach.' I expect that the standard treatment approach will be used by District and Block level Medical Officers to provide standard treatment to all the patients.

Prashant Trivedi (IAS)
Principal Secretary
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Lucknow
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V.Hekali Zhimomi (IAS)
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PREFACE

The Uttar Pradesh Health System Strengthening Project(UPHSSP) has taken several initiatives to improve the health outcomes in the State. UPHSSP has developed a user friendly & customized 'Standard Treatment Approach' to aide medical practitioners.

The 'Standard Treatment Approach' consists of treatment approaches for 14 commonly occurring diseases / medical health conditions. The approach is based on improvising existing treatment modalities in the country. It is a systematically developed document to assist Medical Officers placed at different level of facilities to make decision about the appropriate treatment and referral.

A team of experts from renowned medical colleges and different Government hospitals have actively participated in preparing this document. The aim of this document is to enable uniformity in treatment procedures by the medical officers across the State at all levels of health facilities.

The guidelines have been reviewed by the faculty at King George Medical University, Sanjay Gandhi Post Graduate Institute, Lucknow, Ram Manohar Lohia Institute, Dr. Shyama Prasad Mukharjee (Civil) Hospital, Lok Bandhu Raj Naryan Hospital and Rani Laxmi Bai Hospital.

I expect that this document will enhance knowledge, skills and practices of Medical Officers in the State.

I wish to extend my heartfelt gratitude to the Department of Medical Health and Family Welfare (Government of Uttar Pradesh) and officials from UPHSSP who have taken this initiative to increase the reach of services to the common people in the State.

V. Hekali Zhimomi (IAS)
Secretary, Medical Health
Project Director,
UPHSSP
Government of Uttar Pradesh

Lucknow
July 2017

Dr. Padmakar Singh
Director General
Medical and Health Services
Government of Uttar Pradesh

MESSAGE

I am happy to share that the Department of Health and Family Welfare in collaboration with Uttar Pradesh Health System Strengthening Project has come out with the Standard treatment approaches for 14 most commonly occurring health problems. I am sure that these approaches will assist medical officers and specialists, who are primarily placed at community health centres and primary health centers, in prescribing standard treatments for the common health problems experienced by the people. These approaches have been designed to be used as a guide to help in overall management of patients, and timely referrals.

Department of Health and Family Welfare is grateful to all the institutions and individuals for their continuous support in developing the 'Standard Treatment Approaches.'

I hope that these 'Standard Treatment Approaches' will be used at all level of facilities in the Government Health System of Uttar Pradesh.

Dr. Padmakar Singh
Director General
Medical & Health Services
Government of Uttar Pradesh

Lucknow
July 2017

Dr. Harsh Sharma
Addl. Project Director
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ACKNOWLEDGEMENTS

This 'Standard Treatment Approach' for 14 health conditions/ diseases were developed based on wide consultations and represent the hard work of a large number of individuals and institutions. We sincerely acknowledge the contributions of medical experts and Directorate of Health and Family Welfare, Uttar Pradesh who coordinated the development of these 'Standard Treatment Approaches' with assistance from experts in King George Medical University, Sanjay Gandhi Post Graduate Institute, Lucknow, Ram Manohar Lohia Institute, Dr. Shyama Prasad Mukharjee (Civil) Hospital, Lok Bandhu Raj Narayan Hospital, Rani Laxmi Bai Hospital and Uttar Pradesh Health System Strengthening Project.

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Lucknow
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Contents

1 Poisoning

Poisoning is contact with a substance that results in toxicity. Exposure occurs most commonly by ingestion; other routes include inhalation, insufflation, cutaneous and mucus membrane exposure and injection.

Some exposures have minimal risk. The criteria used to determine whether the exposure is nontoxic are:

1. An unintentional exposure to a clearly identified single substance
2. Where an estimate of dose is known
3. A recognised information source (a poison information centre) confirms the substance as nontoxic in the reported dose.

Asymptomatic patients with nontoxic exposures may be discharged after a short period of observation, providing they have access to further consultation and safe discharge destination.

The first challenge in a poisoned patient is to recognize that a chemical exposure has occurred. Frequently, patients or witness may suggest accidental or intentional poisoning or recreational drug abuse. At other times history is not available.

Stepwise Care Approach

Step 1: Resuscitation & Assessment

Resuscitation is the first priority in any poisoned patient. The ABC's always comes first – stabilization of Airway, Breathing & Circulation should be the priority

"Treat the patient before treating the poison"

Airway

- In the obtunded/unconscious patient, the upper airway may be obstructed because of relaxation of upper respiratory tract muscles or falling of tongue.
- Simply tilting the head backward may open the airway (signs of respiratory obstruction, such as stridor, may disappear)
- In other patients, the "jaw thrust"- placing the fingers bilaterally behind the mandibular angles and displacing the mandible forward or anteriorly or "chin lift" may provide complete control of the upper airway.
- Intubate when necessary.
- Some toxins (acids & alkali) require extra care during airway management

Breathing

- Oxygenation status can be monitored with a bedside pulse oximeter (unreliable in CO poisoning)
- Give oxygen by nasal cannula or face mask to maintain SpO_2 >95%
- Assisted ventilation if patient in respiratory distress and not able to maintain oxygenation (if facilitiy available)

Circulation

- Monitor pulse and BP. Do an ECG. Obtain a good peripheral line and start IV fluids

"Coma cocktail" of Dextrose, Naloxone and Thiamine can be considered in unknown poisoning with unconsciousness and coma.

Table 1 : Resuscitation

Airway Breathing Circulation Detect and correct • Seizures Always generalized when due to toxic causes Benzodiazepines first line • Hypoglycemia Check bedside blood sugar level in all patients with altered mental status Treat if < 4.0 mmol/L or 72mg/dl • Hyper/Hypothermia Temp> 38.5^{0}C prompts urgent intervention

Step 2: Take brief history & physical examination

- Including past medical history and occupational environment
- Type of toxin or toxins, time of exposure, amount taken and route of administration.
- The history from the patient may not always be reliable.
- Vital signs are the most important clues to the diagnosis of poisoning. Trend should be followed. A systemic physical examination can yield important clues about the nature of an exposure.

Step 3: Order investigations

- A basic metabolite panel should be obtained
  - Complete blood count
  - Serum electrolytes & glucose
  - Blood urea nitrogen
  - Liver function tests
  - Arterial blood gases (if available)

  The anion gap, serum osmolality and osmolal gap should be measured in each patient as it can help in finding the cause.

Step 4: Management

- Management of any clinically significant poisoning should begin with basic supportive measures.
- Give antidote if available depending on the poison consumed (Table-2)

Step 5: Decontamination

- **Skin decontamination** should be performed in case percutaneous absorption is suspected (Remove clothes and body sponging)
- GI decontamination, has a less significant role in treatment of poisoning now a days.
- **Gastric lavage** should be done only when patient has ingested potentially life threatening amount of poison and has reached hospital within 60 minutes of ingestion.

  Ideally number 28 to 40 French Ewald tubes should be used in adults and number 16 to 26 French orogastric tubes in children. If not available, Ryle's tube can be used.

  For lavage place the patient in left lateral decubitus position, stomach emptied as completely as possible by aspiration and normal saline or tap water instilled and suctioned out.

Lavage is continued until return is clear. The first 100 ml of the gastric aspirate should be separately collected for toxicological analysis.

Contraindications of gastric lavage: Ingestion of Hydrocarbons, Kerosene, ingestion of a corrosive like a strong acid or alkali, ingestion of glass or other sharp material, absent airway protective reflexes.

- **Activated Charcoal:** Administer single dose activated charcoal to adsorb ingested toxins in case it can be administered within one hour of poisoning.

  Multiple dose activated charcoal given in patients who have ingested life threatening amounts of specific toxins (e.g. carbamazepine, dapsone, phenobarbital, quinine, theophylline, TCA's, Phenothiazines, Alcohol, Salicylates.)

Charcoal should not be administered for ingestions of caustic substances, metals or hydrocarbons, cyanides and pesticides.

Step 6: Enhanced Elimination

- **Alkalinisation of urine** through the administration of IV sodium bicarbonate(1-2mEq/kg IV during 3-4 hours) and normal saline may help in excretion of drugs in urine such as
  - Salicylates (severe cases not meeting criteria for haemodialysis)
  - Phenobarbital
  - Chlorpropamide
  - Methotrexate
- **Haemodialysis** should be considered in severe life threatening poisoning if the toxin can be removed by dialysis
  - Salicylates
  - Lithium
  - Methanol
  - Ethylene glycol
  - Isopropanolol
  - Calcium channel blockers
  - Beta blockers

Table 2: Commonly available specific antidotes

Poison	*Antidote*
Organophosphates	Inj. Atropine 0.05 mg/kg IV every 10 min until signs of atropinism. Inj. PAM 25-50 mg/kg, IV in older children and 250 mg IV in infants over 5-10 minutes, 8 hourly upto 36 hours; Adults 1g IV repeated every 3-4 hours as needed, preferably constant infusion of 250- 400 mg/kg
Cyanide	Sodium nitrite 3% sol., 0.2 ml/kg, IV over 2 min followed by sodium thiosulphate (25% sol., 1 ml/kg IV over 10-20 minutes)
Nitrates and nitrites	If methaemo-globinaemia, treat with methylene blue.
Anticholinergics	Inj. Physostigmine 0.56 mg slow IV over 5 min; repeated every 10 min till a max of 2 mg
Narcotics (Opium)	Inj. Naloxone 0.1 mg/kg IV
Methyl alcohol	Ethyl alcohol 7.6 ml/kg of 10% ethanol followed by maintenance dose of 0.8 ml/kg /hr in non-drinkers and 2.0 ml/kg/hr in drinkers, Fomepizole 15mg/ kg IV loading dose, followed by 10 mg/kg IV every 12 hrs for 48 hrs
Phenothiazine	Inj. Diphenhydramine 1-2mg/kg
Iron	Inj. Desferoxamine 15mg/kg/hr IV in 100-200 ml 5% dextrose
Paracetamol	N-acetyl cysteine: Oral – Loading dose-140 mg/kg, followed by 70 mg/kg, 4 hourly for 17 doses. IV – Loading dose- 150 mg/kg in 200 ml 5% dextrose infused over 15-60 mins, followed by 50 mg/kg in 500ml 5% dextrose in water infused over 4 hours, followed by 100 mg/kg in 1000ml 5% dextrose in water infused over 16 hours.
Diazepam (Benzodiazepines)	Inj. Flumezenil 0.2mg IV, can be repeated every minute, titrated according to response

SYNDROMIC APPROACH TO POISONING

- The clinical diagnosis of the type of poisoning can be identified by the clinical manifestations that may fit into a particular toxidrome
- Substances belonging to a specific class of poisons produce a cluster of signs & symptoms or "toxidrome" and allows one to narrow the differential diagnosis.

Table 3 : Common Toxidromes

Toxidromes	Cholinergic Syndrome	Anticholinergic Syndrome	Sedative-hypnotic Toxidrome	Opioid Toxidrome	Hallucinogenic	Hypoglycemic
Clinical Findings	SLUDGE, DUMBELLS • Salivation • Lacrimation • Urination • Diarrhoea • GI Distress • Rhinorrhea • Bradycardia • Bronchoconstriction • Emesis • Tight miosis	• Dilated pupil • Delirium • Dry flushed skin • Hyperthermia • Urinary retention • Seizures	· Deep coma · Hypotonia · Drowsiness · Pupillary changes · Respiratory and cardiovascular depression · Ataxia	• Constricted Pupil (Miosis) • Respiratory depression • Altered mental status	• Dilated Pupils • Hallucinations • Dysphoria • Anxiety • Hyperthermia	• Altered mental status • Diaphoresis • Tachycardia • Hypertension • Dysarthria • Behavioural change • Seizures
Agents	• Organophosphate insecticides • Carbamate insecticides • Arecoline, Pilocarpine, Carbachol, Mushrooms • Chemical terrorism gases – Sarin	Datura • Anti-cholinergics • Anti-histaminics • Anti-psychotics • Anti-spasmodics • Cyclic Anti-Mydriatics – • Misc.	• Barbiturates • Benzodiazepines • Imidazopyridine (Zolpidem, zopiclone)	• Morphine • Fentanyl • Heroin • Codeine • Methadone • Tramadol • Propoxyphene • Pentazocine	• LSD • Phencyclidine • Psilocybin • Mescaline • Ketamine	• Insulin • Sulfonylureas (Glipizide, Glyburide)
Management	• Atropine – 0.05mg/kg,IV every 10 min until signs of atropinism • Pralidoxime – As bolus – 1-2 g in saline administered over 30 minutes in adults; 20-40 mg/kg to a max of 2g loading dose in children, repeated in 1 to 2 hours if fasciculation still present and then given at 6-12 hour intervals for 24 – 48 hours. As Infusion - 500mg/h in adults	• Activated charcoal • Whole bowel irrigation • IV fluids • Agitation: Benzodiazapines, barbiturates • Physostigmine: 0.5 – 2 mg slow IV (not to exceed 1mg/min) over 5 min; repeated every 10min till a maximum of 2mg	• Flumazenil: titrated doses until reversal of respiratory depression -> may require an infusion • dose: 0.2mg IV -> 0.1-0.4mg/hr	• Naloxone; titrated doses until reversal of respiratory depression • Dose: 0.4 – 2 mg IV/IM/SC (1 – 10 mcg/kg/hr)	• Control agitation • Seizure management	• Dextrose Infusion • Glucagon • Octreotide

Table No. 4 - Agents and its Exampless

	Agents	Examples of Agents
1	Anti-cholinergics	Atropine, Scopolamine
2.	Anti-histaminics	Chlorpheniramine, cyproheptadine, doxylamine, Hydroxyzine, Dimenhydrinate, Diphenhydramine, Promethazine, cetirizine.
3.	Anti-psychotics	Chlorpromazine, Clozapine, Olanzapine, Quetiapine, Thioridazine
4.	Anti-spasmodics	Clidinium, Dicyclomine, Hyoscyamine, Propantheline
5.	Cyclic Anti-depressants	Amitryptyline, Amoxapine, Clomipramine, Desipramine, Imipramine, Nortriptyline
6.	Mydriatics	Cyclopentolate, Homatropine, Tropicamide
7.	Misc	Carbamazepine, cyclobenzaprine, Orphenadrine, Glutethimide, Anti-arrythymics

Table 5: Substances Usually Not Dangerous When Ingested*

Adhesives
Antibiotics, topical
Antifungals, topical
Barium sulfate
Bathtub toys (floating)
Blackboard chalk (Ca carbonate)
Bleach, hypochlorite (Na hypochlorite concentration < 6% and Na hydroxide concentration < 0.5%)
Candles (insect-repellent type may be toxic)
Carbowax (polyethylene glycol)
Carboxymethylcellulose (dehydrating material packed with drugs, film, and other products)
Castor oil
Cetyl alcohol
Cigarettes (small amounts ingested by a child)
Clay, art and craftContraceptives
Corticosteroids, topical
Crayons (children's; marked A.P., C.P., or C.S. 130–46)
Detergent, dishwashing, liquid
Dichloral (herbicide)
Diaper rash cream and ointment
Dry cell battery (alkaline)
Fabric softeners, solid sheets
Glow products (eg, glow sticks, glow necklaces)
Glycerol
Glyceryl monostearate
Graphite
Gums (eg, acacia, agar, ghatti)
Ink (amount in one ballpoint pen)
Iodide salts
Kaolin
Lanolin
Linoleic acid
Linseed oil (not boiled)
Lipstick
Lotion, calamine (excluding products with antihistamines or local anesthetics)
Lozenges, throat (without local anesthetics)
Magnesium silicate (antacid)
Make-up
Matches
Methylcellulose
Mineral oil (if not aspirated)
Newspaper
Paint, water-color or water-based
Paraffin, chlorinated
Pencil lead (graphite)
Petroleum jelly
Plant food (household)
Polyethylene glycols
Polyethylene glycol stearate
Putty
Silica (silicon dioxide)
Soap (bath or dishwashing)
Spermaceti
Starch and sizing
Stearic acid
Talc (except when inhaled)
Titanium dioxide
Toothpaste (with or without fluoride)
Triacetin (glyceryl triacetate)
Vitamins, children's multiple with or without iron
Vitamins, multiple without iron
Zinc oxide
Zirconium oxide

**This table is intended only as a guide. Substances may be combined with phenol, petroleum distillate or other toxic chemicals. A poison control centre should be consulted for up to date information. Almost any substance can be toxic if ingested in sufficient amounts*

Common specific poisonings

ALUMINIUM PHOSPHIDE

It produces Phosphine gas which is a mitochondrial poison. Toxicity can occur either after inhalation of Phosphine gas or after the ingestion of aluminium phosphide pellets. Phosphine has an odour of garlic or rotten fish.

There is no specific antidote and treatment is mainly supportive.

The most important factor is resuscitation of shock and institution of supportive measures as soon as possible.

- Oxygen inhalation
- Early gastric lavage
- IV fluids to maintain adequate hydration
- Inj. Dopamine 4-6 mcg/kg/min to maintain systolic BP >90 mmHg
- Inj. MagSulph as IV infusion
- Soda bicarbonate to maintain bicarbonate level

ORGANOPHOSPHATES

Are cholinesterase inhibitors. May be absorbed through lungs, GI tract, skin, and conjunctivae.

Signs & Symptoms include

Muscarinic	**Nicotinic (as toxicity increases)**
- Nausea & vomiting· - Abdominal cramping· - Chest pain, dyspnoea, wheezing· - **Miosis**· - Bradycardia· - Diaphoresis· - Blurred vision· - Bronchorhhea· - Salivation, Lacrimation, Urination, Diarrhoea	- Tremors, twitching - Weakness - Fasciculation - Paralysis - Tachycardia - Hypertension - Mydriasis - pallor

Antidote: Inj. Atropine and PAM. Treatment discussed in Table 2 & Table 3

METHANOL

Both by sight and smell resembles ethanol.

Clinical presentation is similar to ethanol intoxication except that drowsiness is more pronounced.

Major symptoms

- Severe vomiting and upper abdominal pain
- Diarrhoea
- Dizziness, Headache
- Restlessness
- Dyspnoea
- Blurred vision
- Photophobia
- Hyperaemic optic discs, papilledema
- Blindness
- Delirium
- Fixed and dilated pupils
- Coma
- Cerebral edema
- Cardiac and respiratory depression
- Seizures
- Death

Lab findings – Increased anion gap **Metabolic acidosis**

Treatment – Maintain airway

- Gastric lavage within one hour
- Treat acidosis with IV bicarbonate
- **IV Ethanol – specific antidote** (refer to Table 2)

2 PYREXIA & HYPERTHERMIA

Introduction

The core body temperature should range from 97.7^0 F/ 36.5°C to 97.7^0 F/ 37.5 °C. AM temperature of >98.8^0 F/37.2 degree centigrade or a PM temperature of >99.9^0 F/37.7°C defines a fever. A normal daily temperature variation is typically 0.5 degree centigrade.

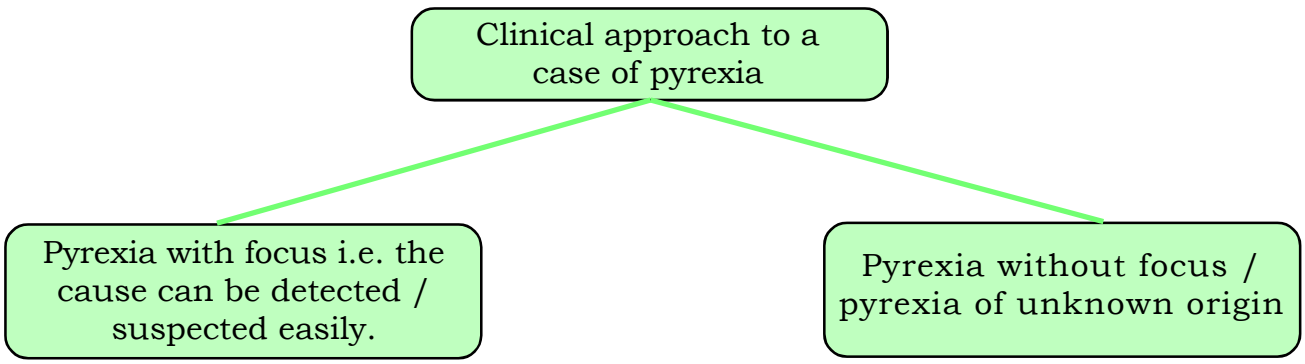
Fever is an elevation of body temperature that exceeds the normal daily variation and occurs in conjunction with an increase in the hypothalamic set point.

The processes of heat conservation and heat production (shivering and increased non shivering thermogenesis) continue until the temperature of the blood bathing hypothalamic neurons matches the new thermostat setting.

A fever of >106.7^0 F/41.5°C is called Hyperpyrexia. This extraordinarily high fever can develop in patients with severe infections but most commonly occur in patients with central nervous system haemorrhages.

Hyperthermia is characterised by an uncontrolled increase in body temperature that exceeds the body's ability to lose heat. The settling of the hypothalamic thermoregulatory center is unchanged.

It is important to distinguish between fever and hyperthermia since hyperthermia can be rapidly fatal and characteristically does not repond to antipyretics. In an emergency situation however making a distinction can be fatal. Hyperthermia often is diagnosed on the basis of events immediately preceding the elevation of core temperature e.g. heat exposure or medication interfere with thermoregulations



Pyrexia with focus

CNS Symptoms

Headache
Vomiting
Focal neurological deficit.
Signs of meningeal irritations.
Seizures
Altered sensorium
Suggestive of acute CNS infection/ accidents.
Refer to higher center

respiratory symptoms/ signs

Upper/ lower respiratory track symptoms / signs.
Tachypnoea / Dyspnoea
If the respiratory rate is more than 30/min despite the temperature made normal refer to higher cente

G1 Symptoms

Abdominal Pain
Nausea
Vomiting
Distension of Abdomen
Guarding rigidity
& Loss of Bowel sounds
If signs and symptoms suggestive of acute peritonitis present then refer to higher cente

Urogenital

Dysuria
Retention of urine
Renal/ ureteric Colic
Genital symptoms and signs
Treat Accordingly If symptoms not relieved.
Refer to specialist

Connective tissue disorders & Organomegaly

Arthralgia
Arthritis
Systemic involvement
Hepatomegaly, Splenomegaly, Lymphadenopathy are suggestive of chronic inflammatory/ lymphoproliferative Myeloproliferative
To be investigated and treated at higher centres

Subcutenous tissue lesion

Obvious infections
Treat accordingly

musculo skeletal disorders

Like myositis, osteomyeliti s, skeletal neoplas
To be investigated and treated at higher centres

Rash

Maculopapular rashes: - Usually associated with viral/rickettsia infections / auto immune diseases
Desquamative erythema: - With Toxic Shcok Syndrome / Stevens Johnson Syndrome / Toxic epidermal necrolysis &

Vesiculobullous or Pustular eruptions: Chicken pox, HSB, rickettsia, & variola infections

Urticaria: - serum sickness, drug induced & disseminated infections

Purpuric eruptions: - Meningococcus, viral haemorrhagic fever, TTP, HU syndrome.

Cause of fever of unknown origin

Bacterial Infection
Spirochetal Infection
Rickettsial Infection
Chlamydial Infection
Viruses
Fungi
Parasite
Neoplasms
Hypersensitivity and autoimmune disease
Granulomatous Disease
Inherited Disease
Central Nervous System Causes
Drugs
Factitious Fever

Cause of Relative Bradycardia

Factitious Fever
Drug Fever
Legionnaires disease
Psittacosis
Typhoid fever
Mycoplasma pneumonia
Brucellosis
Dengue
Yellow Fever
Tuberculosis meningitis
Blackwater fever (Falciparum Malaria with profound hemolysis

Treatment:

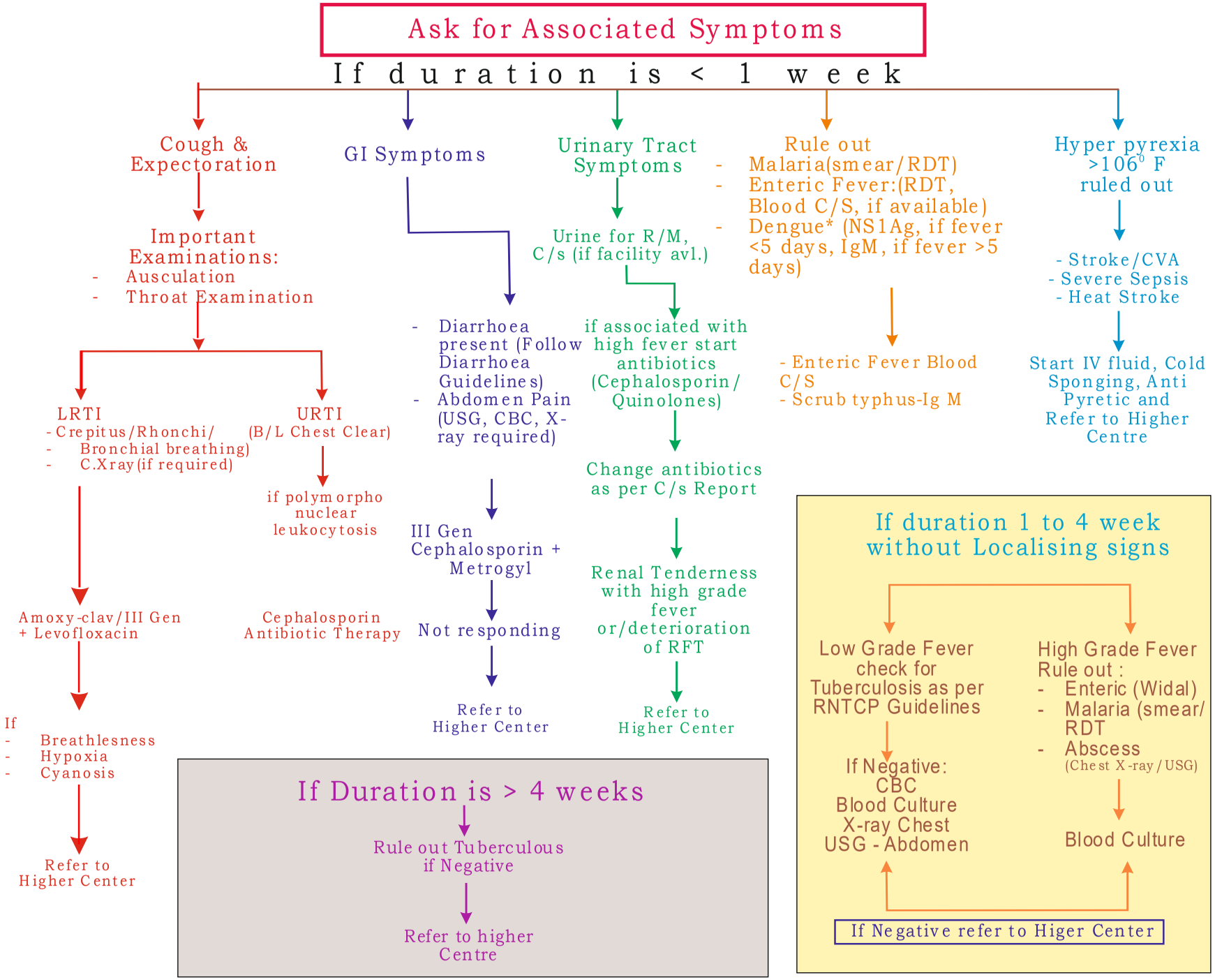
1) Measures for removal of heat: - Alcohol sponges, ice bags, ice water enemas, Ice baths & Cold rooms will lower the body temperature. They are more useful in hyperthermia since patients with cytokine related fever will attempt to over write these therapies

2) Anti- Pyretic drugs: It's not needed except for patients with marginal hemodynamic status. Aspirin or Paracetamol: 325-650 ml every 4 hours is effective in reducing fever. These drugs are best administered continuously rather than as needed to avoid periodic chills and sweats. Aspirin should not be administered in viral exanthematous fever & haemorrhagic viral fever.

3) Anti- Microbial therapy: - The most febrile patients, empiric antibiotics therapy should be deferred pending further evaluation. However empiric antibiotic therapy is sometimes warranted. Prompt broad –spectrum antibiotics are indicated for febrile patients who are clinically unstable, even before infection can be documented. These include patients with hemodynamic instability, those with neutropenia (neutrophils < 500/mcL), others who are asplenic (surgically or secondary to sickle cell disease) or immunosuppressed or those who are HIV infected.

When to refer

If the Pyrexia is associated with shock , altered sensorium , respiratory failure, CHF, Haemorrhage, delirium or acute pyrexia emergency after primary management and maintaining the vitals to be shifted to higher center as soon as possible.


Ask for Associated Symptoms
If duration is < 1 week
Cough & Expectoration
Important Examinations:
- Ausculation
- Throat Examination
LRTI
- Crepitus/Rhonchi/ Bronchial breathing)
- C.Xray(if required)
Amoxy-clav/III Gen + Levofloxacin
If
- Breathlessness
- Hypoxia
- Cyanosis
Refer to Higher Center
URTI
(B/L Chest Clear)
if polymorpho nuclear leukocytosis
Cephalosporin Antibiotic Therapy
GI Symptoms
- Diarrhoea present (Follow Diarrhoea Guidelines)
- Abdomen Pain (USG, CBC, X-ray required)
III Gen Cephalosporin + Metrogyl
Not responding
Refer to Higher Center
Urinary Tract Symptoms
Urine for R/M, C/s (if facility avl.)
if associated with high fever start antibiotics (Cephalosporin/ Quinolones)
Change antibiotics as per C/s Report
Renal Tenderness with high grade fever or/deterioration of RFT
Refer to Higher Center
Rule out
- Malaria(smear/RDT)
- Enteric Fever:(RDT, Blood C/S, if available)
- Dengue* (NS1Ag, if fever <5 days, IgM, if fever >5 days)
- Enteric Fever Blood C/S
- Scrub typhus-Ig M
Hyper pyrexia >106° F ruled out
- Stroke/CVA
- Severe Sepsis
- Heat Stroke
Start IV fluid, Cold Sponging, Anti Pyretic and Refer to Higher Centre
If Duration is > 4 weeks
Rule out Tuberculous if Negative
Refer to higher Centre
If duration 1 to 4 week without Localising signs
Low Grade Fever check for Tuberculosis as per RNTCP Guidelines
If Negative:
CBC
Blood Culture
X-ray Chest
USG - Abdomen
High Grade Fever Rule out :
- Enteric (Widal)
- Malaria (smear/ RDT
- Abscess (Chest X-ray/USG)
Blood Culture
If Negative refer to Higer Center

3 Diarrhoea

DEFINITION

- The passage of frequent loose, liquid or watery stools
- More than 3 times a day

IMPORTANT - The recent change in the consistency and the character of the stool

Diarrhoea in Children:

IF YES, ASK: LOOK AND FEEL:

• For how long? • Look at the child's general condition.

• Is there blood in the stool?

Is the child lethargic or unconscious? Restless and irritable?

• Look for sunken eyes.

• Offer the child fluid.

Is the child not able to drink/drinking poorly? Drinking eagerly, thirsty?

• Pinch the skin of the abdomen. Does it go back:

Very slowly (longer than 2 seconds)?

Signs of Dehydration

Status	No Dehydration	Some Dehydration	Severe Dehydration
Condition	Well, Alert	Restless,Irritable	Lethargic or unconscious floppy
EYES (TEARS)	Normal (present)	Sunken (not present)	Very sunken and dry (not present)
MOUTH & TONGUE	Moist	Dry	Very dry
THIRST	Drinks normally not thirsty	Thirsty, drinks eagerly	Drinks poorly or not able to drink
SKIN PINCH	Goes back quickly	Goes back slowly	Goes back very slowly
DECIDE	The child has no signs of dehydration	If the child has 2 or more signs	If the child has 2 or more signs,

SIGNS	CLASSIFY AS	IDENTIFY TREATMENT (Urgent pre-referral treatments are in bold print)
Two of the following signs: ✦ Lethargic or unconscious· ✦ Sunken eyes· ✦ Not able to drink or drinking poorly· ✦ Skin pinch goes back very slowly.	SEVERE DEHYDRATION	✦If child has no other severe classification:- Give fluid for severe dehydration **(Plan C).** OR ✦If child also has another severe classification: - Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way. Advise the mother to continue breastfeeding.
Two of the following signs: · ✦ Restless, irritable· ✦ Sunken eyes · ✦ Drink eagerly, thirsty· ✦ Skin pinch goes back slowly.	Some Dehydration	✦If child is 2 years or older and there is cholera in your area, give antibiotic for cholera. Give fluid (ORS), zinc supplements and food for some dehydration **(Plan B).** **ORS to be given 75ml/kg body weight in 4-6 hours.** If child also has a severe classification: - **Refer URGENTLY to hospital with mother giving frequent sips of ORS on the way.** **Advise the mother to continue breastfeeding.** ✦Advice mother when to return immediately. ✦Follow-up in 3 days if not improving.
Not enough signs to classify as some or severe dehydration.	No Dehydration	✦Give fluid (ORS). zinc supplements & food to treat diarrhoea at home **(Plan A).** ✦Advise mother when to return immediately. ✦Follow-up in 3 days if not improving.

Plan C: Treat Severe Dehydration Quickly

Follow the arrow. if answer is “YES”, Go Across if ans is “NO” Go Down

Can you give intravenous IV fluid immediately

YES →

Start IV fluid immediately. If the child can drink, give ORS by mouth while the drip is set up. Give 100ml/kg Ringer’s Lactate Solution (or, if not available, normal saline) divided as follows:

Age	First give 30 ml/kg in:	Then give 70 ml/kg in
Infant	1 hour*	5 hours
Children (12 months up to 5 years)	30 minutes*	2 ½ hours

* *Repeat once if radial pulses still very weak or not detected.*

- Reassess the child every 1-2 hours. If hydration status is not improving give the IV drip more rapidly
- Also give ORS (about 5 ml/kg/hour) as soon as the child can drink; usually after 3-4 hours (infants) or 1-2 hours (children)
- Reassess an infant after 6 hours and a child after 3 hours. Classify dehydration then choose the appropriate plan (A,B or C) to continue treatment.

NO ↓

Is IV treatment Available nearby (within 30 minutes)

YES →

Refer URGENTLY to hospital for IV treatment.

If the Child can drink, provide the mother with ORS solution and show her how to give frequent sips during the trip

NO ↓

Are you trained to use a nasogastric (NG) tube for Rehydration

YES →

Start rehydration by tube (or mouth) with ORS solution give 20 ml/kg/hour for 6 hours (total of 120 ml/kg)

IF there is repeated vomiting or increasing abdominal distension, give the fluid more slowly:

IF hydration status is not improving after 3 hours, send the child for IV therapy After 6 hours, reassess the child. Classify dehydration. Then choose the appropriate plan (A,B or C) to continue treatment.

NO ↓

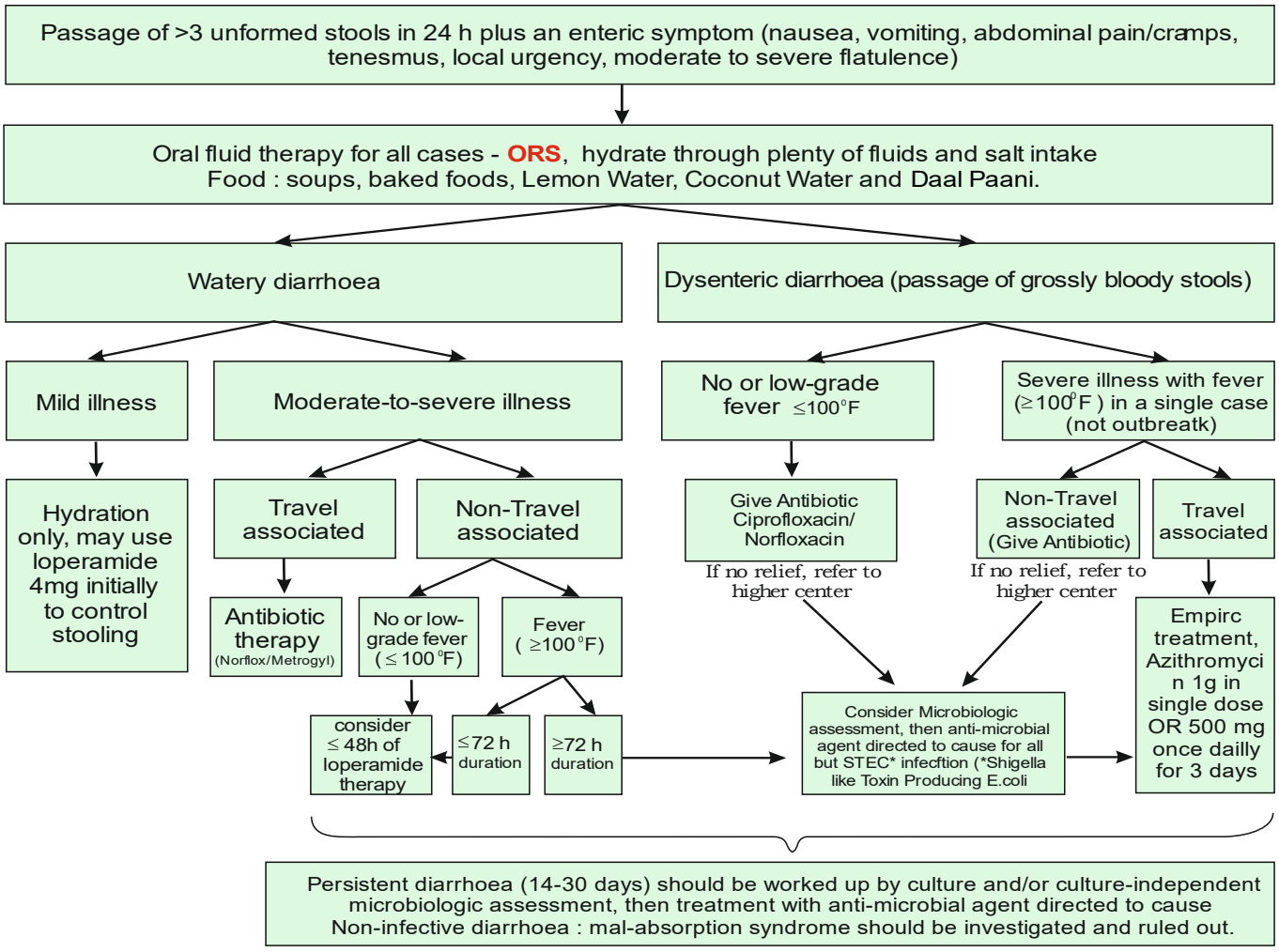
Can the young infants drink

NO ↓

Refer URGENTLY to hospital for IV or NG treatment

Note:
If possible observe the child at least 6 hours after rehydration to be sure the mother can maintain hydration giving the child ORS solution by mouth.

Diarrhoea : Adult



Approach to empiric therapy and diagnostic-directed management of the adult patient with acute diarrhea (suspect infectious etiology)

Prevention

Key measures to prevent diarrhoea include:

- Access to safe drinking water
- use of improved sanitation;
- hand washing with soap;
- exclusive breastfeeding for the first six months of life;
- good personal and food hygiene;
- health education about how infections spread; and
- rotavirus vaccination

4 Dyspnoea

American Thoracic Society Dyspnoea Subjective experience of breathing discomfort that consist of qualitative district sensation that vary in intensity.

Assessing Dyspnoea-

S.No.	Description	Pathophysiology
1	Chest tightness/constriction	Bronchoconstriction, interstitial edema (Asthma, MI)
2	Increased work/effort of breathing	Airway destruction, neuro muscular disease (COPD), moderate to severe asthma, kyphoscoliasis)
3	Air hunger, need to breath, urge to breath	Increased degree to breath (CHF, Pulmonary embolism
4	Can not get deep breath, unsatisfying breath.	Hyper inflation (Asthma, COPD, Restricted) tidal volume (Pulmonary fibrosis, chest wall ristiction
5	Heavy breathing, rapid breathing.	Deconditioning

Evaluation of Patient with Dyspnoea

History

↓

Quality of sensation, timing, positional deposition, persistent Vs intermittent

↓

S.No.	*Physician Examination*		
1.	General appearance	Accessory Muscles/Colour	
2.	Vital Sign	Tachypnea, SPO2 (Oximetry)	
3.	Systemic Examination of chest	A)	Chest - Rhonchi, Rales, Decreased breathing sound, Hyper Inflated lung
		B)	Cardiac - JVP Increased, Precardial Impulse, Gallop murmur.
4.	Extremity	Edema, Cyanosis	

↓

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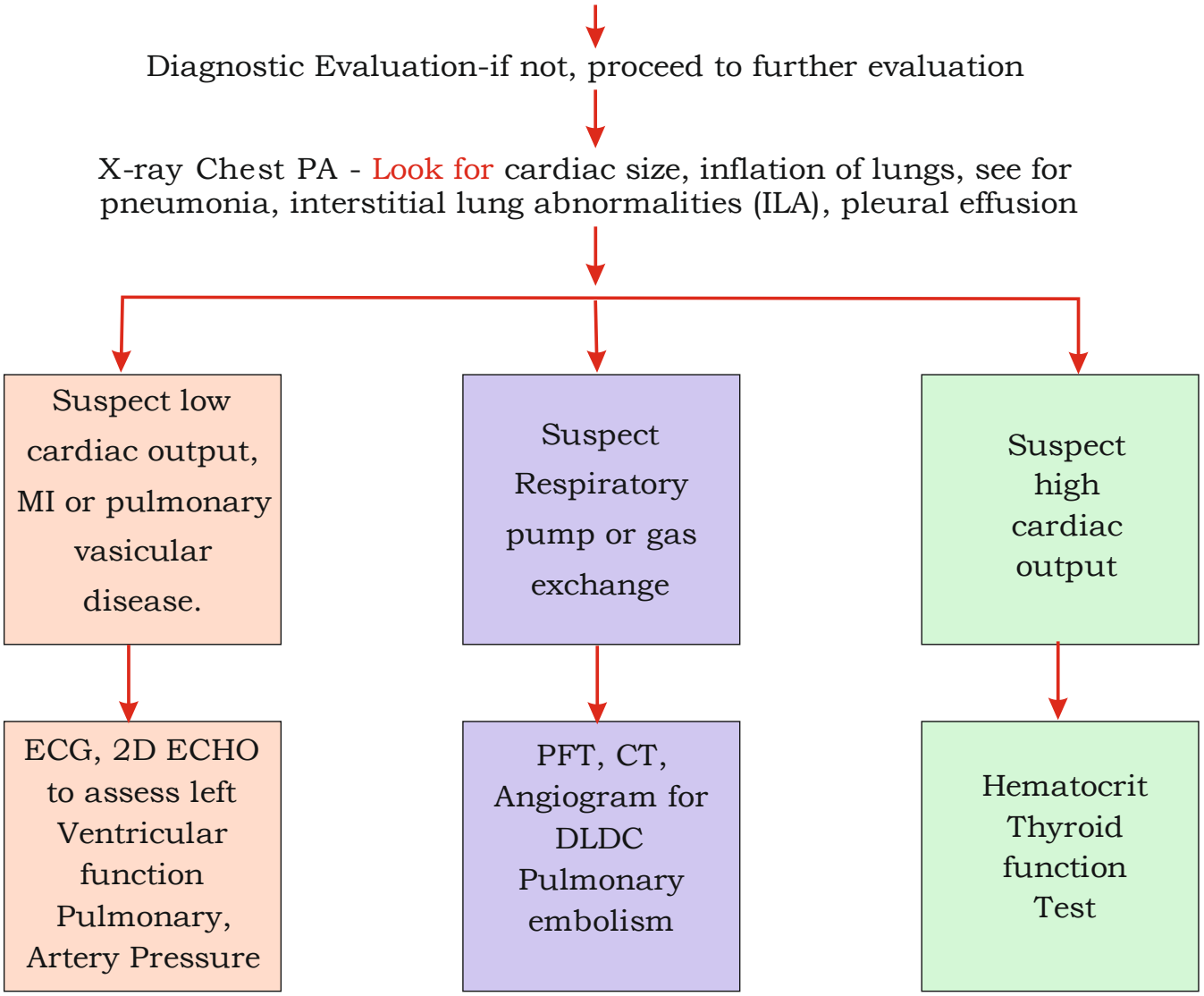


Difference in Cardio Vascular & Respiratory Dyspnoea

Cardio pulmonary Exclusion Test

Pulmonary Causes	**Cardiac Causes**
Achieve Minimum Predicted Ventilation	Ischaemic Changes Increase Heart rate>85% Predicted
Increase Dead Space or Hypoxemia	↑ BP or ↓↓ BP
Bronchospasm	↓O2 Pulse (O2 Concentration/HR)

Treatment of Dyspnoea:

Goal to correct problem responsible.

Attempt to lessen (Decrease) the intensity of Symptom.

O2 adminstration if SPO2 **≤89%**

Pulmonary & Cardiogenic Pulmonary - Edema

Pulmonary	**Cardiogenic Pulmonary Edema**
1- X-ray Chest PA- ✦ Cardiac Size Normal ✦ Alveolar infiltrate redistributed ✦ Plural infusion uncommon	1 Intra Cardiac Pressure- ✦ CS3 gallop ✦ JVP ✦ Pedal edema ✦ Hepatomegaly
	2 Rales/wheeze in chest
	3 X-ray chest PA- ✦ Cardiac Silhouette- ✦ Vascular redistribution- ✦ Interstitial thickening- ✦ Perihilar Alveolar infiltration- ✦ Pleural effusion
Hypoxemia- is due to intra Pulmonary shunting persist despite O2 supplementation	**Hypoxemia-** respond to supplementation O_2 for V/Q mismatch

5 Coma

It is an unconscious state in which an individual cannot be awakened, non-responding normally to painful stimuli, light or sound , normal sleep wake cycle is disrupted and unable to initiate voluntary action.

In broad sense, coma can be described as decline in level of consciousness.

Coma can be categorized according to the magnitude in impairment of sensorium.

CONFUSION-It is a stage of defective attention; however patient can be aroused after giving repetitive stimuli.

LETHARGY- The normal alertness is not maintained and patient prefers sleep in absence of active stimulus.

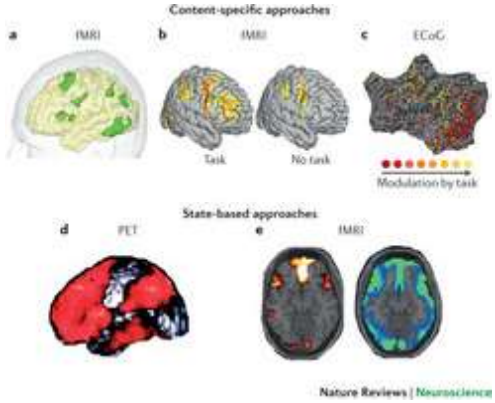
OBTUNDATION- It is a stage between lethargy and stupor. The patient is difficult to arouse.

STUPOR- The patient is arousable only by constant and vigorous stimulation.

COMA- It is complete unresponsiveness to self awareness and external environment.

STRUCTURAL CORRELATES OF COMA

1. Destruction of Reticular activating system (Collection of neurons in upper Pons, Midbrain and Thalamus).
2. Damage to large portion of bilateral Cerebral hemisphere.
3. Involvement of thalamo-cortical pathway



History

The history taking should be brief as time is very precious in management of comatose patients. The history has to be enquired from attendant. The important pointers in historical description are

1. Temporal profile of illness
2. Preceding symptoms: fever, headache, vomiting, convulsions, dizziness (chakkar), double vision etc
3. Medications history, substance abuse, alcohol
4. Medical disorders: Diabetes mellitus, Liver disease, kidney disorders

Acute coma-brainstem stroke,intracranial hemorrhage

Fever with seizures and altered sensorium-Central nervous system infection

Examination

Temperature

Fever: CNS infection(Meningitis, encephalitis),Hypothalamic lesion, pontine involvement, Heat Stroke, Drug(Anticholinergic) intoxication

Low body Temperature : Drugs(barbiturates, sedatives, phenothiazines), alcohol, hypoglycemia, peripheral circulatory failure, hypothyroidism

Pulse rate

Blood Pressure

Acute high blood pressure-Hypertensive encephalopathy

Respiratory rate

Respiratory patterns

Cheyne-Stokes Respiration:

Periods of hyperpnea alternating with short spells of apnea. It is seen in bilateral cortical lesions, bilateral thalamic damage, bilateral lesions of descending pathway from cerebral hemispheres to Pons

Apneustic Breathing

Prolonged pause at the end of inspiration. It occurs due to lesion in midcaudal Pons.

Ataxic Breathing: It is characterized with inspiratory gasps of varying amplitude and length mixed with apneic episodes. The common causes are posterior fossa tumors, cerebellar hemorrhage, trauma etc

Neurological Examination

Observe for lack of movement on one side . It may suggest hemiplegia.

Intermittent clonic movements, jerks give clue about ongoing convulsions.

Presence of Chorea indicates an underlying metabolic encephalopathy.

Posturing

Decorticate: Flexion of elbow, wrist and supination of forearms. It suggests damage above the midbrain on both sides.

Decerebrate: Extension of elbows, and wrists with pronation suggest midbrain and or caudal diencephalon destruction.

LEVEL OF AROUSAL SHOULD BE ASSESSED WITH HELP OF GLASGOW COMA SCALE

TABLE 38-2

Glasgow Coma Scale

BEHAVIOR	RESPONSE	SCORE
Eye opening response	Spontaneously	4
	To speech	3
	To pain	2
	No response	1
Best verbal response	Oriented to time, place, and person	5
	Confused	4
	Inappropriate words	3
	Incomprehensible sounds	2
	No response	1
Best motor response	Obeys commands	6
	Moves to localized pain	5
	Flexion withdrawal from pain	4
	Abnormal flexion (decorticate)	3
	Abnormal extension (decerebrate)	2
	No response	1
Total score:	*Best response*	15
	Comatose client	8 or less
	Totally unresponsive	3

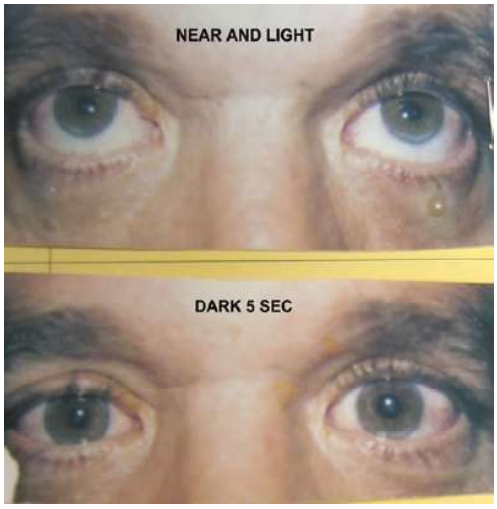
EXAMINATION OF THE EYES

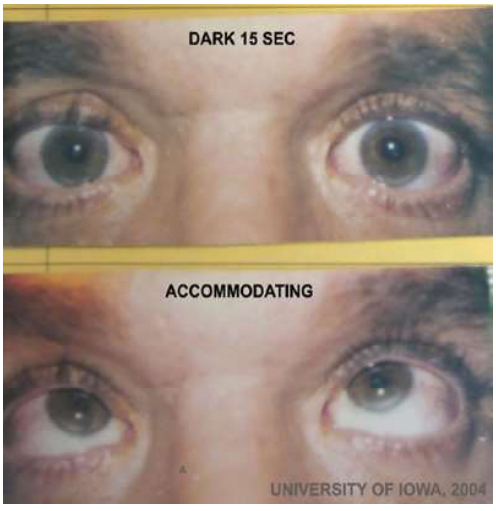
Pupillary Examination: The pupils should be assessed for shape, size,symmetry and response to light. The pupillary abnormality is seen in midbrain or third nerve dysfunction.

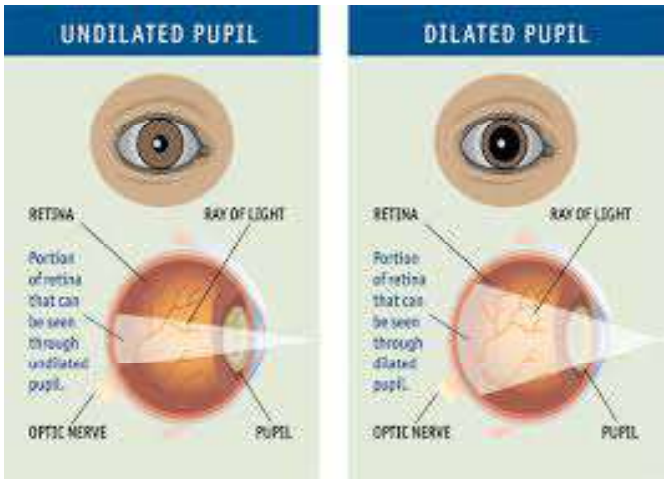
Pupillary reactions should be examined with help of bright diffuse light.

Small reactive pupils are seen in metabolic encephalopathies and suggest bilateral diencephalic function. The pinpoint pupils suggest pontine involvement.

Dilated pupils are seen with drug intoxication. The central herniation leading to bilateral involvement of 3rd nerve results in bilateral unreactive dilated pupils.







EYELIDS

A severe ptosis on one side indicates fascicular 3rd nerve lesion. The nuclear 3rd nerve involvement is characterized by bilateral ptosis. Partial ptosis with small sized pupil is feature of Horner Syndrome.

EYE MOVEMENTS

The eye movements abnormality implicates lesion at level of Pons or Midbrain. In comatose patients , eye movement should be looked systematically, observe for primary position of eyes and spontaneous movements of the globe. An adducted eye indicates 6th nerve palsy while an abducted eye suggest 3rd nerve palsy.

Third nerve palsy on leftside

Roving Eye Movements(Ping –Pong Gaze)

It is characterized by roving of eyes from one extreme of horizontal gaze to the other and back like a ping-pong ball. It occurs in cortical lesions with intact brain stem. The ping pong phenomenon is due to lack of cortical inhibition of horizontal gaze centers in the brainstem.

Ocular bobbing

It is described as conjugate, brisk,bilateral downward movements followed by slow return to mid-position. This is a feature of acute pontine injury. It is a poor prognostic sign.

Ocular dipping (Inverse ocular Bobbing)

It has been described as slow downward eye movement followed by fast return to midposition. This is indicative of anoxic coma.

Conjugate eye movements

A hemispherical lesion accompanied by paresis, eyes look towards the side of lesion. In brainstem lesion eyes look away from the side of lesion or towards paralyzed side.

Oculocephalic reflexes(Doll eye maneuvers)

These are automatic movements of the eyes elicited by moving the head from side to side or in vertical direction. Intact Oculocephalic reflexes means that coma is not due to upper brainstem lesion.

Oculovestibular reflexes

Thermal or caloric stimulation of the vestibular apparatus provides stronger provocation and it is helpful where Oculocephalic reflexes are abnormal. Caloric testing is done by instilling 50 ml of ice-cold water into the external auditory canal for 30 seconds after elevating the head to 30 degree. The normal response is deviation of the eyes to the side of irrigated ear after a brief interval of 30-120 seconds.

MOTOR SIGNS

Paucity of movements on one side gives clue to the presence of hemiparesis.In altered sensorium, normal side falls slowly on elevating the limb while paretic limb falls like a dead weight.

Important Differential Diagnosis of Coma

a. Altered sensorium without lateralizing features

1. Drug intoxication benzodiazepines,opiates,organophosphorus compounds,stimulant drugs,metabolic acidosis due to drugs eg ethanol,methanol
2. Metabolic anoxia, hypo and hypernatremia,hypercalcemia,hepatic coma, uremia,diabetic ketoacidosis, hyperosmolar coma, hypoglycemia, addisonian crisis, hypo and hyperthyroid states, CO2 Narcosis, porphyria,hyperammonemic conditions
3. Nutritional deficiencies Thaimine deficiency,Vitamin B-12 deficiency
4. Septic encephalopathy
5. Non convulsive Status Epilepticus
6. Shock
7. Hypertensive encephalopathy,

8. Subarachnoid hemorrhage

9. Meningitis/ Encephalitis

b. Altered sensorium with lateralizing features

1. Intracranial Hemorrhage

2. Ischemic stroke

3. Brain Tumor

4. Cerebral venous sinus thrombosis

5. Demyelinating disorders

6. Cerebral vasculitis

Differentiation between metabolic and structural coma

Feature	Metabolic coma	Structural coma
Level of consciousness	Fluctuates	Static or worsens with time
Deep sighing respiration	Frequent	infrequent
Papilledema	Rare	Common
Pupils	Light reaction is preserved till late stages	Light reaction may be early affected
Ocular motility	May be symmetrically affected	asymmetrically affected
Focal neurologic deficits	Usually absent	Usually present
Reflex eye movements	Usually normal	May be affected
Involuntary movements	Tremor,myoclonus,chorea, asterixis commonly present	Rare

Psychogenic coma

The patient keeps the eyes tightly closed and resist eye opening. Pupils are normal on examination. Oculocephalic reflexes are intact. Motor examination is essentially normal.

Lab Investigations

Complete blood count, biochemical profile including blood sugar, blood urea, serum creatinine, serum bilirubin,SGPT/ SGOT, serum albumin, serum ammonia, serum electrolytes, blood and urine toxicology screen, creatinine kinase, thyroid function test etc

Interpretation

Severe leucocytosis-Sepsis/ Pyogenic meningitis

Elevated blood ammonia- hepatic encephalopathy

Thyroid dysfunction- Hypothyroid coma/ Hashimoto encephalopathy

NEUROIMAGING

CT Scan head/ Magnetic resonance imaging of the Brain

ELECTROENCEPHALOGRAPHY

LUMBAR PUNCTURE

It gives vital information .THE CAVEAT IS DO LUMBAR PUNTURE ONLY AFTER EXCLUDING STRUCTURAL DISORDER BY FIRST SUBJECTING PATIENT FOR CT SCAN(HEAD)

TREATMENT OF COMA IN LIMITED RESOURCE SETTINGS

As coma has varied causes , a structured algorithmic approach is required for physicians for treating patients of coma. Ideally cause of coma has to be ascertained and to be treated accordingly. The reversible causes of coma should be vigilantly explored.

The empirical treatment can be administered even before the establishment of diagnosis. Intravenous Thiamine 100mg can be infused in suspected Wernicke encephalopathy. Intravenous dextrose (25-50%) 50g to be given in all patients of acute coma in suspicion of Hypoglycemia. Inj Naloxone 0.8 mg I/V can be given in appropriate clinical setting of suspected opiate overdosage.Antibiotics are administered at the earliest in all cases of suspected bacterial meningitis, sepsis. If there is presence of continuous convulsions or unexplained coma antiepileptic drugs should be given without any delay.

Physicians should be aware of early stroke signs and should refer the patients within window hours of 4.5 hours for possible thrombolytic therapy.

6 Trauma

Trauma is the leading cause of death in the younger age group. Deaths and disability occurring after trauma can be prevented by immediate treatment in many cases.

Trauma can be chemical, thermal or mechanical energy.

The Golden Hour: ***The critical first period following injury in which lifesaving measures must be undertaken and definitive management should be started to ensure best chance of survival and to reduce morbidity.***

The components of major trauma management are:

1 Primary survey

2 Resuscitation phase

3 Secondary survey

4 Definitive treatment phase

5 Follow up and rehabilitation

1. Primary Survey

Is a rapid assessment of vital functions to identify life threatening conditions and allow their immediate correction.

2. Resuscitation Phase

- **A**irway and cervical spine control
- **B**reathing and Ventilation
- **C**irculation with control of bleeding
- **D**isability assessment and Deformity
- **E**xposure and Examination

AIRWAY AND CERVICAL SPINE CONTROL

- Clear Airway, mouth, nose and throat of blood, vomitus and secretions by suction.
- Maintain airway by chin lift or jaw thrust, oropharyngeal airway or Endotracheal intubation and Ventilation.
- Immobilize cervical spine in neutral position by Hard Cervical collar.

BREATHING AND VENTILATION

- Oxygenate, intubate, ventilate, if respiratory rate is <10 or >30. Administer high flow oxygen up to 10 L/min by face mask or assisted ventilation
- Treat tension pneumothorax - immediately by inserting wide bore canula / ICD.
- Drain large hemothorax.
- Occlusive dressing (air tight) and ICD for open pneumothorax.

CIRCULATION

- Arrest active bleeding by direct pressure or suturing
- Replace volume with fluids
- Transfuse fully cross matched blood when available
- Reduction and Immobilise of fractures-early.
- Rule out causes of Occult Bleeding like blunt Injury abdomen , blunt injury Chest, fracture Pelvis, polytrauma,

DISABILITY ASSESSMENT AND DEFORMITY

- Assess patient's level of consciousness.
- Pupil size and reaction to light.
- Glasgow coma scale (Eye opening, Motor response and Verbal response) .
- Hypovolemia may produce severe brain dysfunction, hence should be corrected first.

EXPOSURE AND EXAMINATION

- Expose the parts
- Evaluate injuries completely
- Record findings

3. Secondary Survey

Remove all clothing before examination

Examine oral cavity, nose, ears and scalp

Digital rectal examination if necessary

Investigate-essential radiology

X-ray chest, abdomen, cervical spine, pelvis, skull and other parts as and when required

Ultra - Sonography

CT brain for head injury patients.

Avoid missing injuries and disabilities during secondary survey, since missed injuries are common in trauma patients, eg. Fracture phalanx or toe may be missed in a case with head injury or multiple fractures.

Plan for emergency surgery.

4. Definitive Treatment phase

Tetanus and antibiotic prophylaxis

Pain relief

Assurance

Splintage, Cast , Brace , Aerocast .

ORTHOPEDIC–Management of MusculoSkeletal System – fracture fixation.

SURGEON – Management of Blunt Injury Abdomen.

NEUROSURGEON – Management of Head injury and Spine injury.

CARDIO THORACIC SURGEON – Management of blunt injury chest.

PLASTIC SURGEON -Management of Crush Injury , Compound injury , Limb Loss.

Splinting in injured/fractured part of the limb at PHC/CHC before referral

Injured/Fractured Part of limb	Extent of splintage
Fingers	Support with adjacent finger (called Buddy's Strapping)
Hand	Terminal pulp of fingers to proximal third of forearm.
Wrist	Distal palmar crease to upper one third of forearm.
Elbow and forearm	Distal palmar crease to upper one third of arm.
Arm	Middle one third of forearm to base of neck (include shoulder)
Foot and ankle	Base of toes to upper one third leg.
Leg	Base of toes to upper one third thigh (include knee and ankle) Can apply Bohler Braun splint also.
Knee	Just above the malleoli to upper one third of thigh
Thigh	Base of toes to nipple line on trunk. Refer for better option of application of Thomas Splint

MEDICO-LEGAL RECORD

Record the pulse BP, Level of consciousness, orientation to time, place and person and general condition of the victim.

Record the date, time and by whom the patient was examined with name in capital letters and designation

Record the date, time, place and details of accident, and the person bringing the victim (Relative / Attendant / Police)

Site, size, depth, number and type of wounds should be recorded.

Paper photography.

If the victim's breathe smells of alcohol / under the influence of alcohol, it should be recorded , Blood samples to be taken.

If referred from some other hospital /Nursing home / clinic, the referral note should be attached and the fact should be noted in the accident register.

Sign the Accident Register with the date and name in capital letters.

Record transfer details and sign

Inform RMO / higher authorities about VIPs or mass casualties

Other Services

Arrange transport for the victim while referring or during discharge (ambulance)

Discuss with the patient's relatives and provid psychological support throughout treatment

Brain death certification and possible organ donation in brain death cases.

Complete formalities expedetiously when the patient expires

Provide psychological support to aggrieved family members

Arrange post mortem in medico-legal cases

Send the body to the mortuary without delay

HEAD INJURY

When to suspect

Ask For	Look For	Rule Out
1. H/o Loss of consciousness (Most important)	1. Pupillary reflexes equal or unequal	1. Cervical spine injury.
2. H/o Headache (continuous)	2. Black eye	2. Blunt trauma abdomen/chest
3. H/o Confusion	3. CSF rhinorrhoea/otorrhoea	3. Bony fractures.
4. H/o Convulsion/Seizure	4. Any neurological deficit	4. Other associated injuries
5. H/o Nausea/vomiting	5. Planter reflexes	↓
6. H/o ENT bleed		Followup trauma protocol
7. Weekness of any limb		

Primary Health Center/Community Health Center

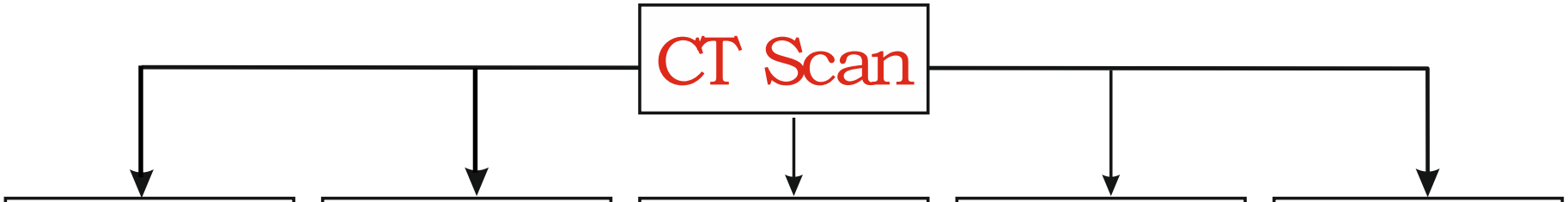
1. Treat symptoms.

2. If required oxygen/IV drip/antiemetic/antibiotics.

3. Cervical spine injury. apply cervical neck collar.

4. These patients will need CT Scan referred them to higher center with availability of CT Scan facility (preferably round the clock)

District Hospital (CT Scan available/Surgeon available/Neurosurgeon unavailable)



Cerebral Edema

Manage Conservatively*

Conservative Management

- Broad spectrum antibiotics
- IV fluid.
- Inj. Mannitol 1-2 gm/kg body-weight (adult 100 ml IV 8 Hrly.
- Inj. Eptoin 5 mg/kg bodyweight (100 ml IV 8 Hrly
- Inj. Rantac (proton pump inhibitor)1 amp. IV 12 Hrly.
- SOS sedative preferably inj. Haloparidol (Serenace)

Contusion

1. Unilateral small- *Conservative management.
2. Unilateral with midline shift- start conservative management. refer to higher center with availability of neurosurgeon, surgery might be needed.
3. Unilateral/Bilateral multiple contusion- *treat conservative.
4. Unilateral/bilateral with midline shift- start conservative management. refer to higher center with availability of neurosurgeon, surgery might be needed.

Epidural Haematoma

1. Small – No midline shift, manage *conservatively.
2. Small with midline shift- start conservative management, refer to higher center with availability of neurosurgeon, surgery might be needed.
3. Big- start conservative management, refer to higher center with availability of neurosurgeon, surgery might be needed.

Acute Subdural Haematoma.

1. Minimal midline shift- *manage conservatively.
2. Gross midline shift- start conservative management, refer to higher center with availability of neurosurgeon, surgery might be needed.

Intra cerebra bleed

1. midline shift (minimal or no)- *treat conservatively.
2. Gross midline shift- start conservative management, refer to higher center with availability of neurosurgeon, surgery might be needed.

Note:1. The treatment may vary as per resources available in terms of medicines/specialist/ investigation/transportation distance and other conditions which are outside the scope of treating doctor.

All patients undergoing conservative management- if deteriorate, get repeat CT Scan done. If same CT Scan findings, continute same treatment. If midline shift -es refer to higher center with neurological facilities.

7

Chest Pain

OBJECTIVES

By reading this material you should be able to :

- Appreciate the importance of chest pain as a presenting symptom
- Feel more confident about the recognition and early management of chest pain
- Recognise common clinical symptoms associated with cardiac disease

BACKGROUND

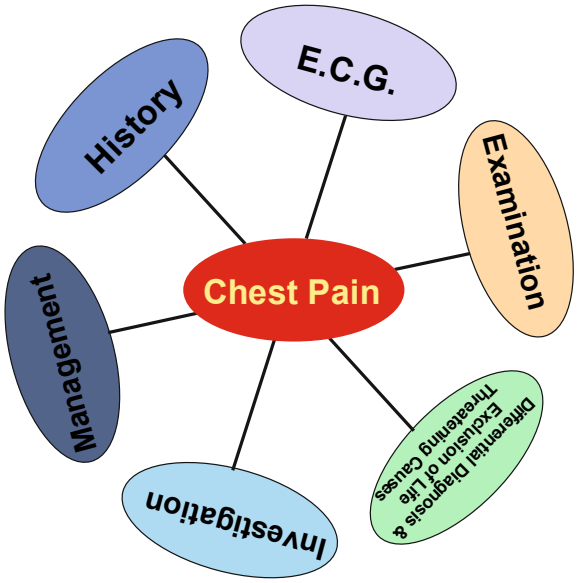
Chest pain accounts for up to 50% of all acute medical admissions and a significant proportion of these will be due to cardiac causes.

CAUSES OF CHEST PAIN

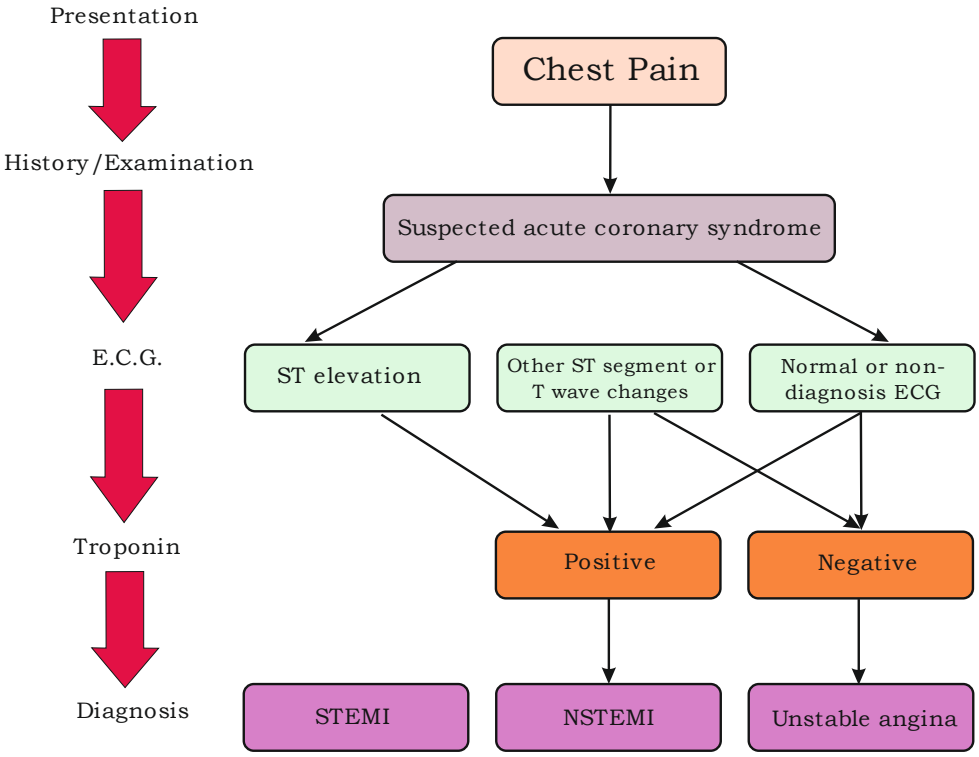
Any disease affecting T4 dermatome will mimic cardiac type of chest pain and inframammary; Momentary chest pains are usually non cardiac/functional in origin.

S.No.	Cardiac	Respiratory	Gastrointestinal	Musculo Skeletal
1	Acute Coronary Syndrome	Pulmonary Embolism	Oesophagitis	Costochondritis
2	Aortic Dissection	Pleuridyna	Acute Peptic Disease	Spinal Disease
3	Pericarditis	Pleural Disease	Hiatus Hernia	
4	Myocarditis			

Step-by-step Diagnostic Approach



The Classificaton of Acute Coronary Syndromes



Key Questions:

1) **Where** exactly do you get the pain?
2) Does the **pain travel anywhere**?
3) Can you give me a careful **description** of the pain?
4) How long did the **pain last** and could you do anthying to **releive it**?
5) Is the pain brought on by **exertion and relieved by rest**?
6) Do **cold** conditons bring it on?
7) Do you have any **other symptoms**, such as breathlessness, faintness, sweating or back pain?
8) Is the pain made **worse by breathing or coughing** or by movement of pressing on that area?
9) Is there any **blood** in any sputum you bring up?
10) Is your pain associated with what you **eat and drink**? Or with a bitter taste in your mouth?
11) Do you get the pain on **stooping over** and after **lying in bed** at night?
12) Do **antacids** relieve your pain?
13) Have you noticed a **rash** where you get the pain?
14) Have you had a blow to your chest or any **injury** to your back?

System, Syndrome, Clinical Description and Key Distinguishing Features

System	Syndrome	Clinical Description	Key Distinguishing Features
Cardiac	Angina	Restrosternal chest pressure, burning or heaviness, radiating occasionally to neck, jaw epigastrium shoulders, left arm.	Precipitated by excersize, cold weather, or emotional stress, duration 2-10 min.
	Rest or unstable angina	Same as angina but may be more severe	Typically<20 min, lower tolerance for exertion, crescendo pattern.
	Acute myocardial infarction	Same as angina but may be more severe	Sudden onset, usually lasting> 30 min, often associated with shortness of breath, weakness, nausea, vomiting.
	pericarditis	Sharp, pleuritic pain aggravated by changes in position, highly variable duration.	Pericardial friction rub
vascular	Acetic dissection	Excruciating ripping pain of sudden onset in anterior of chest, often radiating to back	Marked severity of unrelenting pain, usually occurs in setting of hypertension or underlying connective tissue disorder such as Marfan syndrome
	Pulmonary embolism	Sudden onset of dyspnoea and pain, usually pleurtic with pulmonary infraction	Dyspnoea, tachycardia, signs of right heart failure.
	Pulmonary hypertension	Substernal chest pressure, exacerbated by exertion.	Pain associated with dyspnoea and signs of pulmonary hypertension
Pulmonary	Pleuritis and/or pneumonia	Pleuritic pain, usually brief, over Involved area	Pain pleuritic and lateral to midline, associated with dyspnoea
	Tracheobronchitis Spontaneous pneurnothorax	Burning discomfort in midline sudden onset of unilateral pleuritic pain, with dysponea	Midline location, associated with coughing Abrupt onset of dysponea and pain
Gastro-intestinal	Esophageal reflux	Burning substernal and epigastric discomfort 10-60 min in duration	Aggravated by large meal and postprandial recumbency, relieved by antacid
	Peptic ulser	Prolonged epigastric or substernal burning	Relieved by antacid or food
	Gallblader disease	Prolonged epigastric or right upper quadrant pain.	Unprovoked or following meal.
	Pancreatitis	Prolonged, intense epigastric and substernal pain	Risk factors including alcohol, hypertriglyceridemia medications
Musculo-skeletal	Costochondritis	Sudden onset of intense fleeting pain	May be reproduced by pressure over afflected joint, occasionally, swelling and inflammation over costochondral joint
	Cervical disc disease	Sudden onset of fleeting pain	May be reproduced with by neck
	Trauma or strain	Constant pain	Reproduced by palpation or movement of chest wall or arms
Inflec-tious	Herpes zoster	Prolonged burning pain in dermatornal distribution	Vesicular rash, dermatornal distribution
Psycho-logical	Panic disorder	Chest tightness or aching, often accompanied by dyspnea and lasting 30minutes or more, unrelated to exertion or movement	Vesicular rash, dermatornal emotional disorder.

The initial management of all patients presenting with chest pain should always start with ABCDEassessment.

REMEMBER: if the patient is presenting acutely unwell, there is sometimes not time to elicit a full history prior to commencing treatment. Under these circumstances

A. The airway should be checked and oxygen administered

B. The breathing and ventilation status of the patient should be assessed. Apply pulse oximetry.

C. The circulation should be assessed by feeling the peripheries, instituting i.v. access and measuring pulse and blood pressure.

D. Assess the patients disability – in this case their conscious level

E. Make sure the patient is undressed to facilitate examination. Make sure the patient is neither too hot or too cold.

The cause of the pain should then be quickly sought so as to commence the appropriate treatment, such as thrombolysis, rapidly.

History

After assessing the patients in the ABCDE approach, specific points in the history should be sought in order to elicit the likely cause.

Examination

Clinical examination can often be normal in patients presenting with an acute coronary syndrome (ACS). Examination is therefore directed towards identifying complications of the ACS (eg. Arrhythmias, acute heart failure), or establishing an alternative diagnosis.

Signs of an arrhythmia:

- irregular pulse
- fast or slow heart rate
- low blood pressure
- Altered conscious level if blood pressure is very

Signs of heart failure:

Right heart	-	peripheral oedema
	-	pulsatile liver edge
	-	raised JVP
Left heart	-	reduced air entry or crackles in the lung bases.
	-	tachycardia (because the heart is unable to pump much blood out with each beat, so it beats faster to compensate)
	-	cool peripheries with a prolonged capillary refill time.
	-	In severe heart failure, the blood pressure may be low.

Alternative diagnosis

Aortic dissection	-	differential pulses (depends on level of dissection, but may be difference between left and right radial, or radial and femoral pulses)
	-	differential blood pressure between left and right arms
	-	acute aortic regurgitation
	-	signs of cardiac tamponade (muffled heart sounds, raised JVP)
Pericarditis	-	audible pericardial friction rub
Pneumothorax	-	hyper-resonance to percussion on affected side
	-	reduced or absent breath sounds on affected side
	-	tracheal deviation in a tension pneumothorax
Pulmonary embolism	-	signs of a DVT (swollen, oedematous leg)
	-	occasionally raised JVP (in massive PE)
Perforated oesophagus	-	surgical emphysema
	-	signs of sepsis
Musculo-skeletal	-	tenderness to palpation or movement (the presence of this does not rule out a more serious pathology – be very careful when attributing chest pain to the musculoskeletal system)

Investigations

ECG

A 12 lead ECG should be performed on all patients immediately

Bloods

Blood tests should include full blood count, urea and electrolytes, glucose, lipids and appropriately timed cardiac enzymes Troponin T or I.

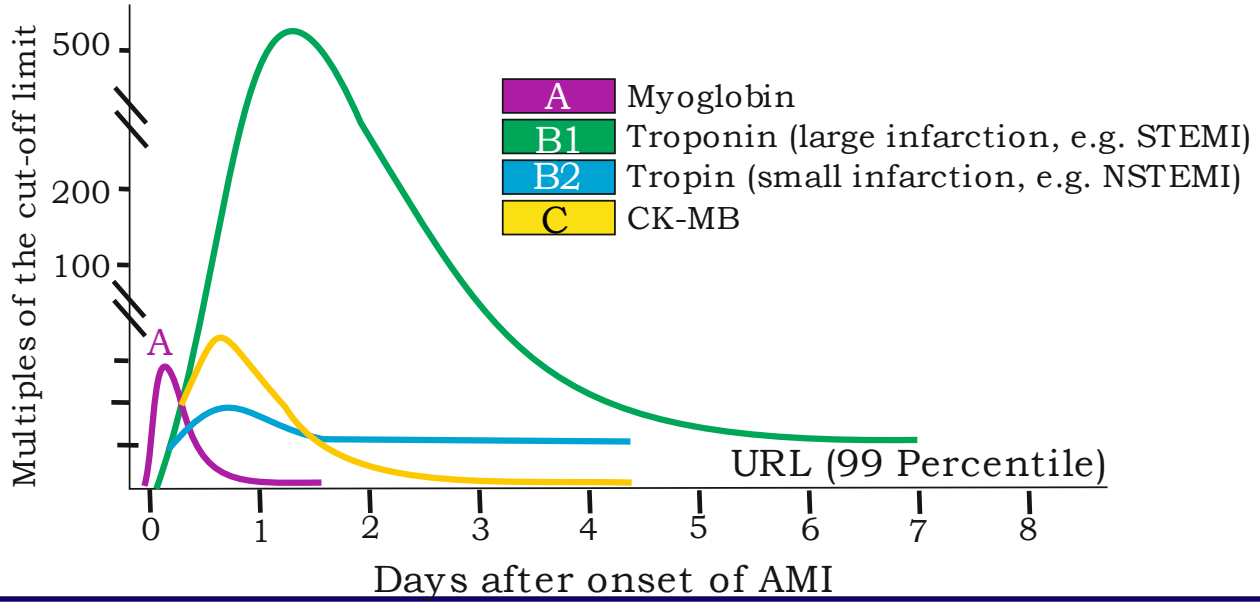
X-ray

The chest x-ray is likely to be normal in an ACS. It can be useful where diagnosis is in doubt ie.-aortic dissection or respiratory/oesophageal.

Classification of Acute Coronary Syndromes

Acute coronary syndrome (ACS) is used to describe a range of clinical conditions including acute ST elevation myocardial infarction, non-ST elevation myocardial infarction and unstable angina.

	12 hours serum troponin T Connection (u/g/l)		
	<0.01	>_0.01 <1.0	>_1.0
BCS Definition	ACS with unstatble Angina	ACS with myocyte necrosis	ACS with clinical myocardial infarction
ECS/ACC Difinition	Unstable angina	myocardial infarction	myocardial infarction
WHO Definition	Unstable angina	Unstable angina	myocardial infarction
30 days mortality	4.5%	10.4%	12.9%
6 months mortality	8.6%	18.7%	19.2%



Management of Acute Coronary Syndromes

The aims of the acute management of ACS are:

1. Rapidly establish a diagnosis
2. Treat any haemodynamic and acute arrhythmic complications
3. Provide prompt pain relief and adequate arterial oxygen concentrations
4. Initiate rapid reperfusion to limit infarct size and minimise the risk of pump failure and arrhythmias
5. Treat any early complications
6. Risk assessment for longer term management and commence secondary prevention

All patients (unless strongly contra-indicated) should be treated with aspirin 300mg,clopidogrel 300mg, atorvastatin 80mg stat dose.Sublingual GTN spray / sorbitrate 5 mg can be used for pain control.

ST Elevation Myocardial Infarction (STEMI)

STEMI occurs when a coronary artery becomes acutely occluded with thrombus following the rupture of an atheromatous plaque.

The diagnosis of a STEMI is confirmed by:

- history of cardiac sounding chest pain
- a limited examination for shock / murmurs / complications
- 12 lead ECG criteria:
  - 1mm ST elevation in 2 contiguous limb leads
  - 2mm ST elevation in 2 contiguous chest leads
  - New left bundle branch block
  - True posterior infarct (dominant R wave and ST depression in V1 + V2).

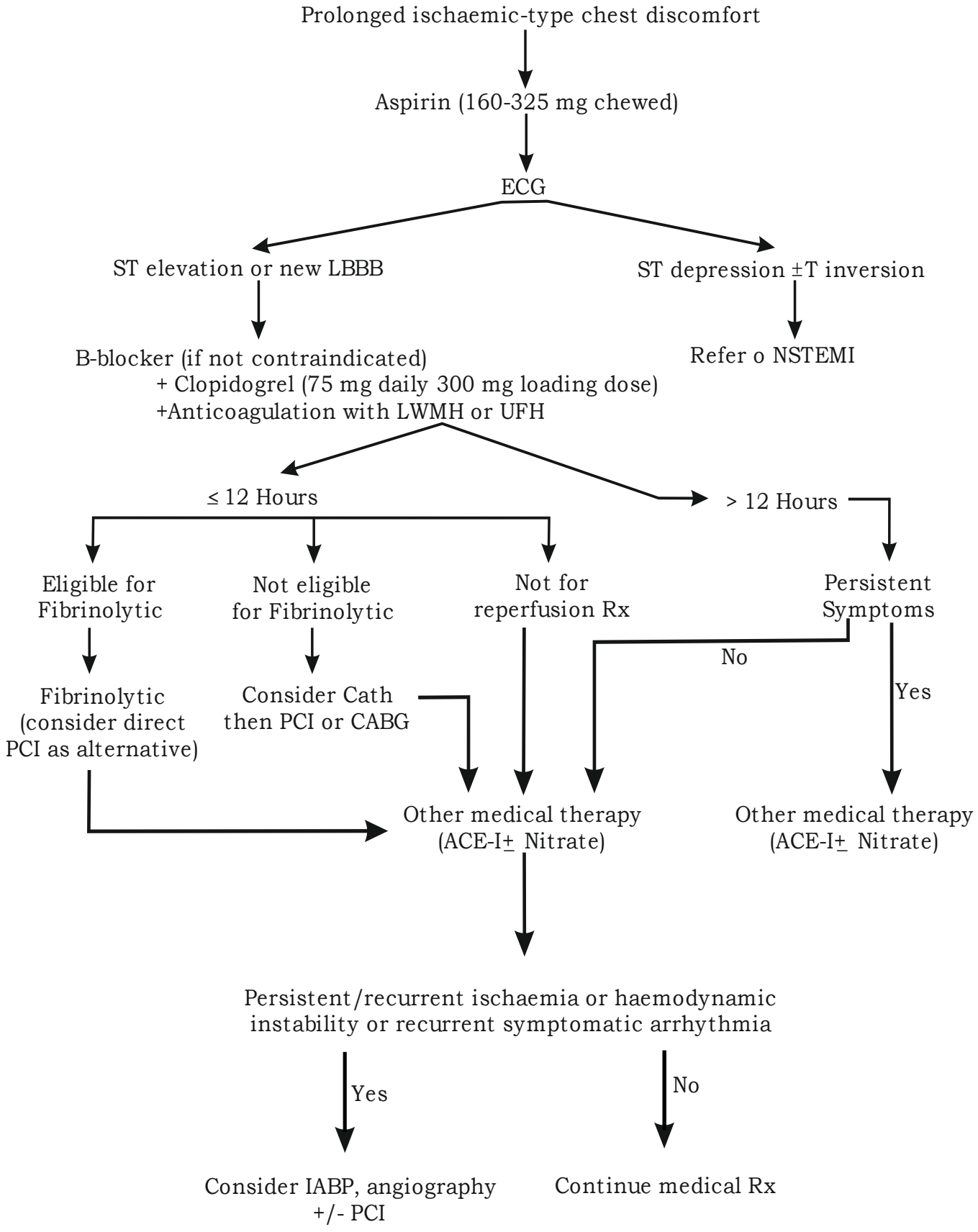
Treatment

1. Primary percutaneous coronary intervention
2. Thrombolysis

VASODILATORS AND INOTROPES USED IN MI

Drug	Usual Dosage Range	Comments
Nitroglycerin	5-100 μg/min	May improve coronary blood flow to ischemic myocardium
Nitroprusside	0.5-10 (μg/Kg)/min	More potent vasodilator, but improves coronary blood flow less than nitroglycerin. With therapy >24 h or in renal failure, watch for thiocyanate toxicity (blured vision tinnitus, delirium)
Dobutamine	2-20 (μg/kg)/min	Results in ↑ cardiac output, ↓ PCW, but does not raise bp
Dopamine	2-20 (μg/kg)/min	More appropriate than dobutamine if hypotensive. Hemodynmic effect depends on dose; (μg/kg)/min <5: ↑ renal blood flow 2.5-10: positive inotrope >10: vasoconstriction
Milrinone	50 -μg/kg over10 min, then 0.375-0.75 (μg/kg)/min	Ventricular arrhythmias may result

Specific Rx Protocol

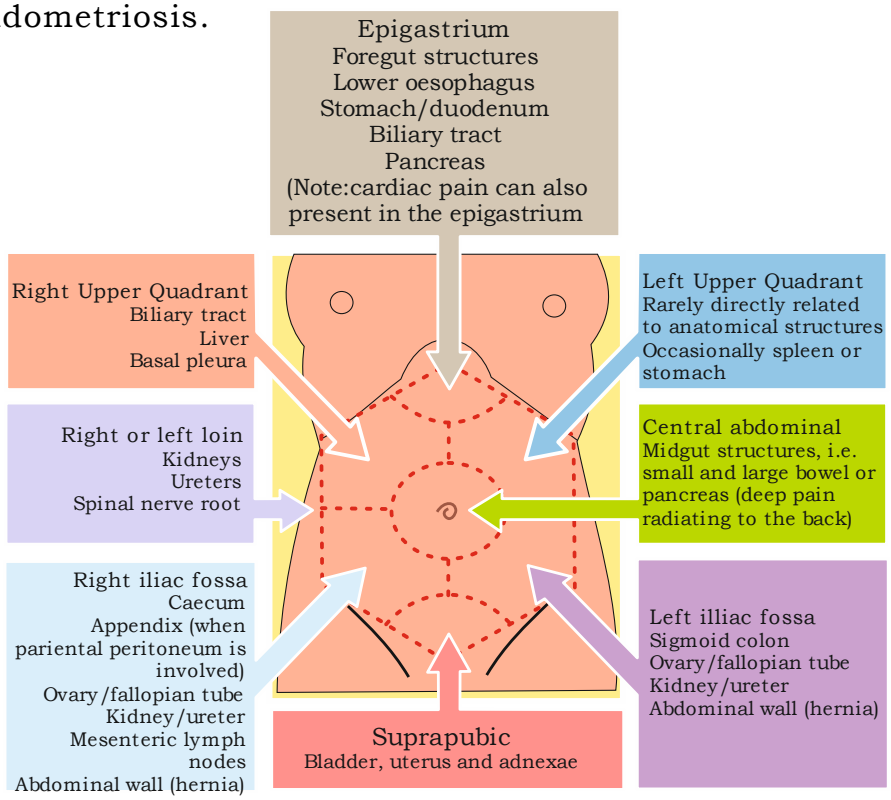


8 Acute Abdominal Pain

The Acute abdomen may be defined generally as an intraabdominal process causing severe pain and often requiring surgical intervention .

Common Causes

1- Non Specific Abdominal Pain (34 percent)
2- Appendicitis (28 percent)
3- Acute Cholecystitis/Cholelithiasis (10 percent)
4- Sub Acute intestinal obstruction (SAIO-4 percent)
5- Duodeneal Perforation (3 percent)
6- Pancreatitis (3 percent)
7- Diverticulitis (2 percent)
8- Others (13 percent)
9- Common Causes in Females. (3 percent)
   - Salphingitis.
   - Twisted Ovarian cyst.
   - Ectopic Pregnancy.
   - Endometriosis.



Primary Health Centre

Ask for –

1- Where is the pain located (consult diagram think about differential diagnosis from that particular quadrant), pain radiating to back are many times suggestive of involvement of retroperitoneal organs/ structure.

2- Any complaint of vomiting/ constipation/burning micturation.

3- In female patients, ask for menstrual related history (very important in right lower quadrant & left lower quadrant and in suprapubic region.

Examine For

1- Look for peritonitis – hard board like abdomen.

2- Rebound tenderness.

3- Tenderness in a particular quadrant.

4- Bowel sounds absent or present.

5- Any distension of abdomen.

Draw inference

1- First think about common causes from the list above.

2- Presence of peritonitis along with absence of bowel sounds is mostly indicative of perforation and will require surgery. Keep the patient nill orally, put in ryle's tube, give IV fluid, broad spectrum antibiotics, other supportive medications and refer to CHC/District Hospital.

3- Tenderness in a particular quadrant such as right hypochondria is suggestive of cholecystitis and in right lower quadrant is suggestive of appendicitis. Treatment will be keeping the patient nill orally, provide analgesic & antibiotics along with IV fluid and other supportive medication, observe if pain not relived. Refer to CHC/ District Hospital.

4- Distention of abdomen along with history of unable to pass bowel with increase in bowel sounds is suggestive of subacute to acute intestinal obstruction. Treatment will consists of: nill orally, ryle's tube aspiration, IV fluid, analgesic & other supportive medication. Refer immediately to CHC/District Hospital.

5- In both lower quadrant and hypogastrium in females think above female causes, ask for date of menstruation (rule out ectopic pregnancy), regularity of menstruation which will be altered in cases of endometriosis. Refer to CHC/District Hospital.

6- Always examine inguinal region, pain from inguinal hernias/ testicular pathologies can radiate to both lower quadrants and hypogastrium.

CHC/District Hospital

1. Get x-ray abdomen erect done along with x-ray chest.
2. Get ultrasound done.
3. Get required blood investigations.
4. Treat according to the cause.

9 Pneumonia

PNEUMONIA

It is an inflamatory process involving lungs parenchyma.

ARI (Pneumonia) is responsible for 20% of under-5 mortality.

Aetiology varies with age

*** Upto 3 months of age**

» Gram negative bacteria and Group B streptococcus

*** 3 months – 5 years**

» Streptococcus pneumonia

» H.influenzae

» Staph. aureus

» Viruses

*** > 5 years of age**

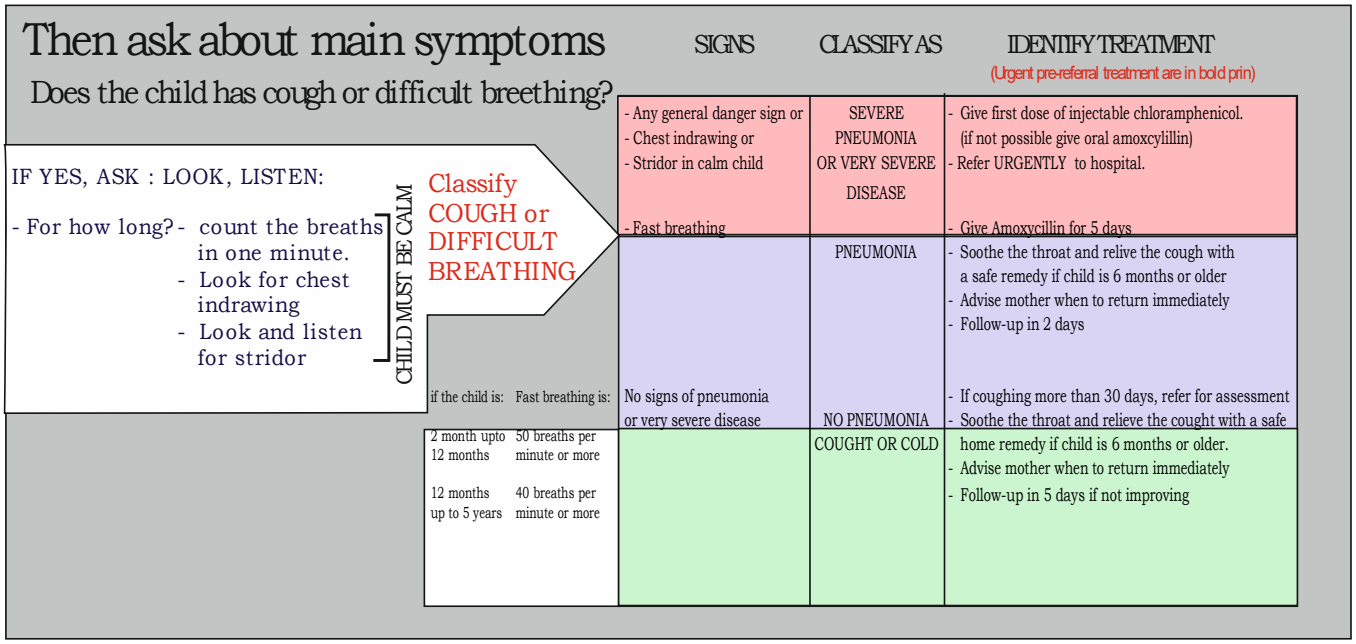
» S pneumonia

» Mycoplasma pneumonia

» viruses

Clinical features

- Fever
- Fast breathing (RR: Upto 2 months of age: 60/minutes or more; 2 months - upto 12 months: 50 or more; 12 months – upto 5 years: 40 or more) count RR for full 1 minute when child is not crying
- Increased work of breathing (IWB) - Nasal flaring, chest indrawing and grunt
- Crackles / bronchial breathing on auscultation is heard if pneumonia is confined to a lobe



Recommendation 1

Children with fast breathing pneumonia with no chest indrawing or general danger sign should be treated with oral amoxicillin: at least 40mg/kg/dose twice daily (80mg/kg/day) for five days.

Children with fast-breathing pneumonia who fail on first-line treatment with amoxicillin should have the option of referral to a facility where there is appropriate second-line treatment.

A three-day course of antibiotics is as effective as a five-day course in treating children with fast breathing pneumonia

Recommendation 2

Children age 2–59 months with chest indrawing pneumonia should be treated with oral amoxicillin: at least 40mg/kg/dose twice daily for five days.

Oral amoxicillin is as effective as injectable penicillin in the treatment of chest indrawing pneumonia in children in low-resource settings

Oral amoxicillin is equally effective for pneumonia of various severities in a high-resource setting

It is safe to treat chest indrawing pneumonia at home with oral amoxicillin

Efficacy of higher dose (80–90 mg/kg/day) vs. lower dose (45 mg/kg/day) of amoxicillin - Amoxicillin is more effective when given in higher doses.Amoxicillin can be given twice instead of thrice daily for children with fast breathing and chest indrawing pneumonia

Recommendation 3

Children aged 2–59 months with severe pneumonia should be treated with parenteral ampicillin (or penicillin) and gentamicin as a first-line treatment.

— Ampicillin: 50 mg/kg, or benzyl penicillin: 50 000 units per kg IM/ IV every 6 hours for at least five days

— Gentamicin: 7.5 mg/kg IM/IV once a day for at least five days

Ceftriaxone should be used as a second-line treatment in children with severe pneumonia having failed on the first-line treatment.

Recommendation 4

Ampicillin (or penicillin when ampicillin is not available) plus gentamicin or ceftriaxone are recommended as a first-line antibiotic regimen for HIV-infected and -exposed infants and for children under 5 years of age with chest indrawing pneumonia or severe pneumonia.

Recommendation 5

Empiric cotrimoxazole treatment for suspected Pneumocystis jirovecii (previously Pneumocystis carinii) pneumonia (PCP) is recommended as an additional treatment for HIV-infected and exposed infants aged from 2 months up to 1 year with chest indrawing or severe pneumonia.

Empirical cotrimoxazole treatment for Pneumocystis jirovecii pneumonia (PCP) is not recom-mended for HIV-infected and exposed children over 1 year of age with chest indrawing or severe pneumonia.

Implications for implementation at community level (integrated Community Case Management)

— all children with fast breathing are classified as having “pneumonia” and treated with oral amoxicillin;

— children with “chest indrawing” pneumonia should be referred to a higher level. However, in situations where referral is not possible and if local health policy allows, CHWs may treat chest indrawing pneumonia with oral amoxicillin;

— dispersible amoxicillin is the preferred treatment for children.

At the health facility level, changes in the management of ARI implied by these new recommendations can be summarized as follows:

— all children with fast breathing and/or chest indrawing are classified as having "pneumonia" and treated with oral amoxicillin; the recommended dosage is 80 mg/kg for five days (40 mg/ kg twice a day).

— only those children who have either general danger signs or who are HIV positive and have chest indrawing need to be referred to higher level facility for inpatient treatment with injectable antibiotics;

— dispersible amoxicillin is the preferred treatment for children.

PNEUMONIA IN ADULT

WHEN TO SUSPECT: Patient comes with Fever, cough, chest pain and breathing difficulty of short duration (usually < 1 week).

Most common microorganism: Streptococcus Pneumonia

Do chest X ray if available- Consolidation, infiltrates &/or Pleural effusion

If No CXR available then calculate CRB 65 score (point 1 for each score)

1 C- Confusion clinically in presentation

2 R- Respiratory Rate> 30/min

3 B- BP- systolic BP < 90 mmHg

4 Age >65 years

If Score is 1 or <1— treatment on OPD basis

Drugs:

A) Patients without co-Morbidity

oral macrolides (e.g. azithromycin500mg) or oral β-lactams (e.g. amoxicillin 500–1000 mg thrice daily)

B) Patient with Co-Morbidity (Diabetes, COPD, chronic heart disease, Liver disease or Renal disease, Alcoholism, Malignancy, Use of antibiotics with in previous 3 months)

β-lactams plus macrolides

Fluoroquinolones should not be used for empiric treatment (As it is 2nd line ATT)

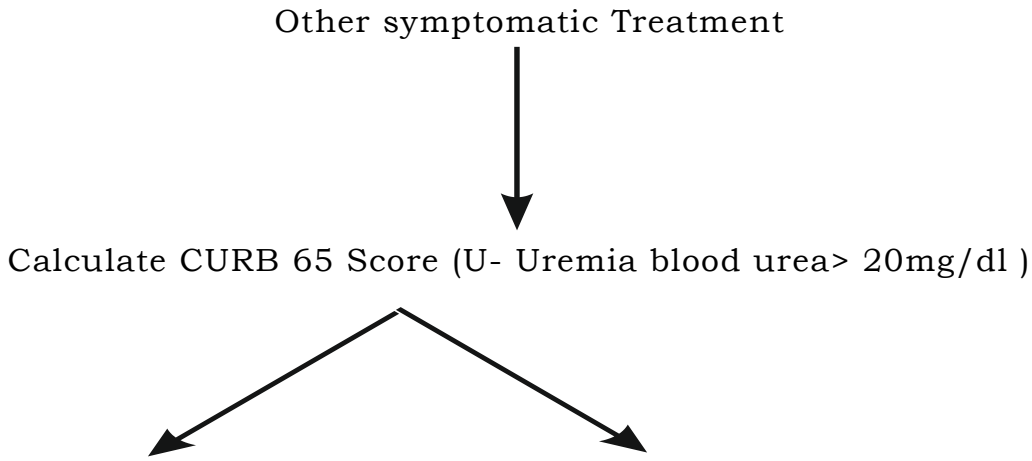
If Score is 2 or more— Admit patient

Do Chest X ray, Send Blood culture, sputum culture, CBC, Liver and Renal function test, arterial blood gas analysis and Pulse Oximetery.

Give 1st dose of Antibiotics (Inj. Ceftriaxone/ Cefotaxime 1gm i.v and inj. Azithromycin 500mg iv)

Give Oxygen if SPO2< 90%

Tab. Paracetamol 500mg if chest pain



Treatment in ward

1) The recommended regimen is combination of a β-lactam plus a macrolide (preferred â-lactams include cefotaxime 1gm iv tds, ceftriaxone 1gm iv tds , and amoxicillin–clavulanic acid 1.2 gm iv bd).

2) IV fluid if Dehydrated or poor oral intake.

3) Paracetamol inj or tab if fever or chest pain persist.

4) Oxygen saturation monitoring and keep SPO2> 95%

5) Other symptomatic treatment

Treatment in ICU

- Antibiotic according to Culture and drug sensitivity.
- Management of Sepsis, ARDS and other organ failure.

Other Recommendation

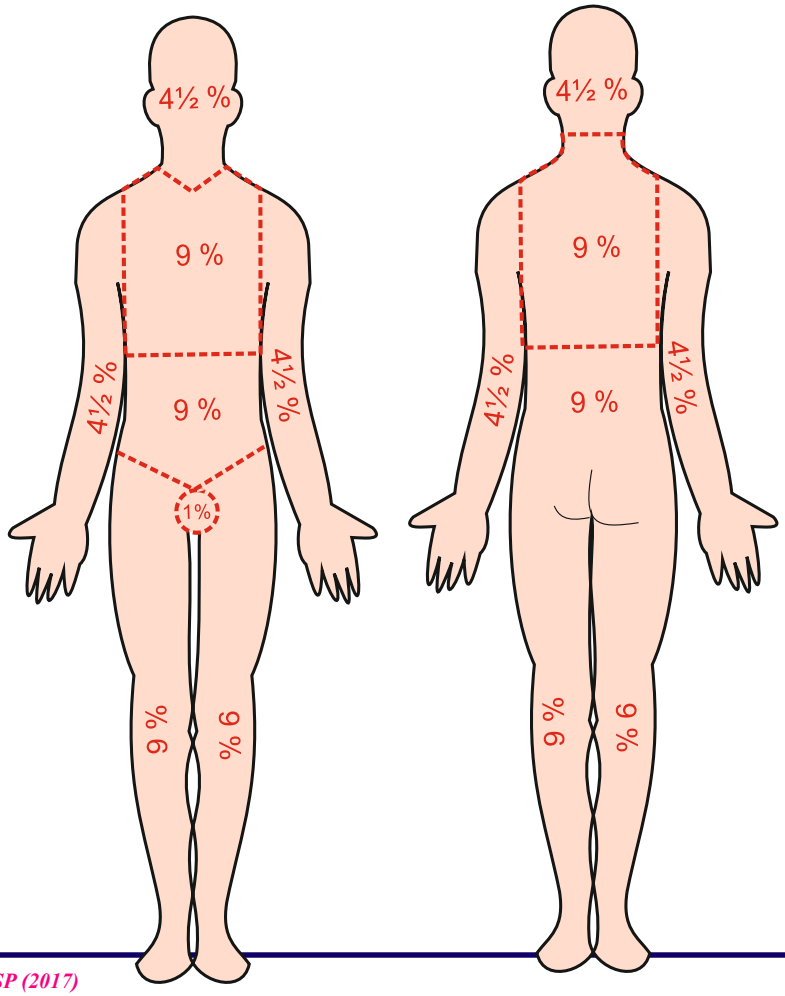
1. Switch to oral from intravenous therapy is safe after clinical improvement in moderate to severe Community Acquired Pneumonia (CAP)
2. Patients can be considered for discharge if they start accepting orally, are afebrile, and are hemodynamically stable for a period of at least 48 h.
3. Outpatients should be treated for 5 days and inpatients for 7 days.
4. Antibiotics may be continued beyond this period in patients with bacteremic pneumococcal pneumonia, Sta. aureus pneumonia, and CAP caused by Legionella pneumoniae and non–lactose-fermenting Gram negative bacilli.
5. Antibiotics may also be continued beyond the specified period in those with meningitis or endocarditis complicating pneumonia, infections with enteric Gram-negative bacilli, lung abscess, empyema, and if the initial therapy was not active against the identified pathogen.

BURN

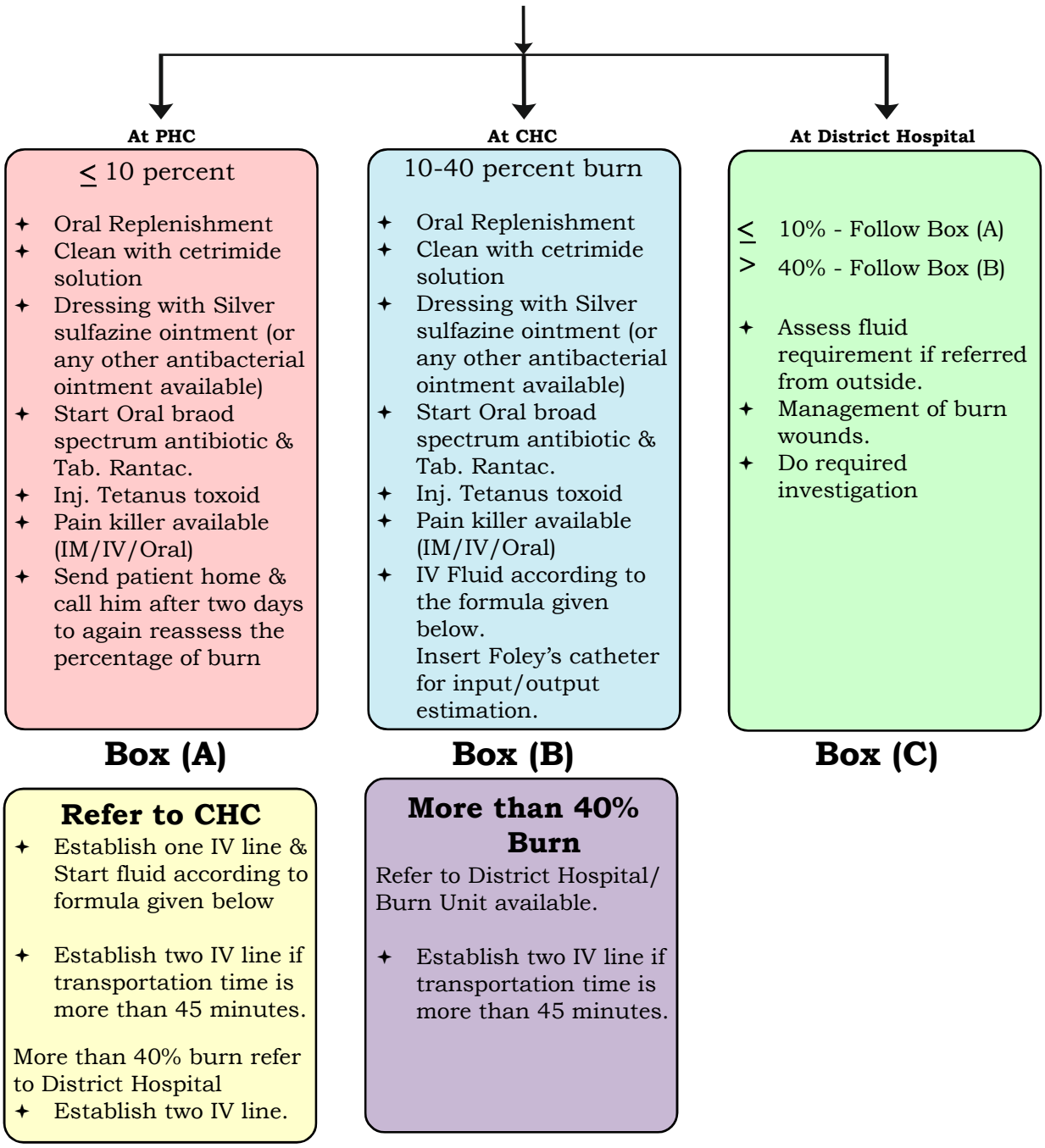
Adult

Child

Assess percentage of burn use rule of 9 (Refer Diagram)	Assess percentage of burn use size of palm of patient as one percent of burn area



After assessment of percentage of burn



Fluid estimation formula = 4 x Weight of Patient (in Kg.) x % of burn = Fluid (in ml.) for next 24 hrs half of which to be given in 8 hrs. from time of injury (Note: From time of burn not from the time when patient presented to you) e.g. if the weight of the patient is 50 kg. and percentage of burn is 40% then 4 x 50 x 40 = 8000 ml. in first 8 hours give 4000 ml. and in next 16 hours give 4000 ml. crystalloid fluid should be given easily available Ringer Lactate.

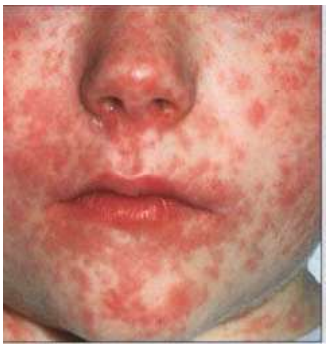
- General Measure to be taken : Application of dressing (bandages should not be very tight, do not wrap limbs especially at the flexures (joint) as this will encourages contractures.
- Bandage each fingers separately.

Note : Medicolegal examination and documentation alongwith information to police and recording of statement preferably by magistrate, if possible suspected social injury.

11

Measles

Definition



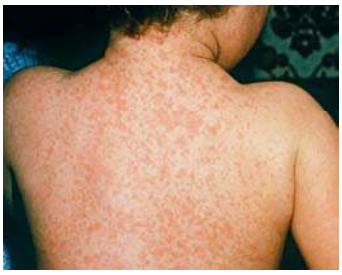
Measles is an acute viral infection characterized by a maculopapular rash erupting successively over neck,face,body and extremeties and accompanied by a high grade fever.

Measles is a common and serious viral exanthematous illness, associated with high morbidity &mortility.

It is caused by a RNA virus & transmitted by droplet spread from the secretion of nose & throat usually 4 days before to 5 days after the rash.

Important- Any Fever with rash should be suspected as Measles

Clinical Features



The disease is most common in preschool children, infants are protected by transplacental antibodies, which generally decay by 9 months. Prodromal phase is characterized by fever, rhinorrhea, conjuctival congestion & a dry tracking cough. An erythematous macule – papulue rash appearing on the 4th day of the illness, and a pathognomonic exanthem (Koplik spots) characterize it. Rash start from behind the ears, along the hair line, involve the face and then the trunk and the limbs.

Prevention

Measles vaccine is a live attenuated vaccine.

Dose and route 0.5 ml subcutaneous.

National schedule : At 9 month (≤ 6 month during outbreaks) administer 2nd dose of measles ≤ 4 week apart, preferably as MMR at 12-15 month and 4-6 years.

Catch up ≤12 mo = given MMR Vaccine

Post Exposure prophylaxis with immunoglobulin is indicated for all immunocompromized contacts irrespective of immunization status and exposed infants aged 6-12 months.

Warning Signs (Child must be seen by paediatrician /Hospitalized)

1. Altered sensonium, altered behaviour, convulsions, stiff neck, and extreme drowsiness.
2. Rapid and/or laboured breathing, difficulty in feeding, cyanosis.
3. Severe dehydration.
4. Blood in stools; vomiting, diarrhoea
5. Earache, painful eyes, blurred vision.

- All patients of rashes with fever and cough, cold, or conjunctivitis should be reported to DIO.

- **Strategy for reducing measles mortality**

  1- Immunization

  2- Surveillance

  3- Case management

Case management- isolation of child

Case management of uncomplicated measles

Many children will experience uncomplicated measles and will require only supportive measures:

- give Vitamin A if in an area of known deficiency or high measles case fatality rates
- advise mothers to treat the child at home as long as no complications develop
- provide nutritional support: continue breast feeding or give weaning foods and fluids at frequent intervals and treat mouth ulcers
- control fever by keeping the child cool
- instruct to return for further treatment if the child's general condition worsens or any of the danger signs develop
- explain to mothers that there is an increased risk of diarrhoea, acute respiratory infections and other infections in the weeks following measles and encourage them to seek medical advice early
- immunize close unimmunised contacts, if they are identified within 72 hours of exposure.

Case management of complicated measles

In developing countries, at least three-quarters of cases can be expected to have at least one complication and some may have multiple systems involvement.

Actions to be taken in cases of complication include:

- refer to health facility for further management.
- follow the above recommendations for case management of uncomplicated measles .
- ensure that two doses of vitamin A are given.
- clean eye lesions and treat with 1% tetracycline eye ointment three times a day for 7 days (for corneal lesions, cover the eye with a patch) - vitamin A administration is particularly important to minimize the risk of potentially blinding eye lesions.
- clean ear discharge and treat with antibiotics .
- refer suspected encephalitis to hospital .
- treat malnutrition and diarrhoea with sufficient fluids and a high quality diet.
- treat pneumonia with antibiotics.

12

Swine Flu (H1N1 Influenza)

Case Definition

A suspected case of the Pandemic Influenza A H1N1 virus infection is defined as a person with acute febrile respiratory illness (reported or documented fever, and one of the following: cough, sore throat, shortness of breath, difficulty in breathing or chest pains) with onset:

- Within 7 days of close contact with a person who is a probable or confirmed case of the new influenza A (H1N1) virus infection, or
- Within 7 days of travel to a community internationally where there has been one or more confirmed Pandemic influenza A (H1N1) cases, or
- Resides in a community where there are one or more confirmed new influenza cases.

A Probable case of Pandemic Influenza A (H1N1) 2009 virus infection is defined as an individual with an influenza test that is positive for influenza A, but is unsubtypable by reagents used to detect seasonal influenza virus infection;

OR

An individual with a clinically compatible illness or who died of an unexplained acute respiratory illness who is considered to be epidemiologically linked to a probable or confirmed case.

A Confirmed case of Pandemic Influenza A (H1N1) virus infection is defined as an individual with laboratory confirmed new influenza A (H1N1) virus infection by one or more of the following:

- Real-time RT-PCR,
- Viral culture
- Four-fold rise in new influenza A(H1N1) virus-specific neutralizing antibodies.

Symptoms

Fever | **Headache** | **Chills** | **Diarrhoea** | **Cough** | **Sneezing**

Sore-throat | **Block Nasal Passage** | **Fatigue**

Diagnosis

Whom to test — Testing for pandemic H1N1 influenza A should be considered in individuals with an acute febrile respiratory illness (a measured temperature of 100^0F or higher and recent onset of at least one of the following: rhinorrhea, nasal congestion, sore throat, or cough).

Priority for testing should be given to:

- Those who require hospitalization and
- Those who are at high risk for severe complications

To establish the diagnosis of pandemic H1N1 influenza A, an upper respiratory sample (nasopharyngeal swab, nasal swab, throat swab, combined oropharyngeal/ nasopharyngeal swab, or nasal aspirate) should be collected. In intubated patients, an endotracheal aspirate should also be obtained.

IMPORTANT: High Risk Group

- ✦ Children younger than 5 years old;
- ✦ Adults 65 years of age and older;
- ✦ Chronic pulmonary condition (including asthma), cardiovascular (except hypertension), renal, hepatic, hematological (including sickle cell disease), neurologic, neuromuscular, or metabolic disorders (including diabetes mellitus);
- ✦ Immunosuppression, including that caused by medications or by HIV
- ✦ Pregnant women
- ✦ Residents of nursing homes and other chronic-care facilities
- ✦ Obesity

Treatment

In order to prevent and contain outbreak of Influenza A H1N1 virus for screening, testing and isolation following guidelines (issued by the Govt. of India) are to be followed. If you are suspecting secondary bacterial infection (high grade fever for more than 5 days, increased CBC), start antibiotic Doxycycline or Azithromycin.

All individuals seeking consultations for flu like symptoms should be screened at designated healthcare facilities or examined by a doctor and these will be categorized as under:

Category- A

- Patients with mild fever plus cough / sore throat with or without body ache, headache, diarrhea and vomiting will be categorized as Category-A. They do not require Oseltamivir and should be treated for the symptoms mentioned above. The patients should be monitored for their progress and reassessed at 24 to 48 hours by the doctor.
- No testing of the patient for H1N1 is required.
- Patients should confine themselves at home and avoid mixing up with public and high risk members in the family.

Category-B

- In addition to all the signs and symptoms mentioned under Category-A, if the patient has high grade fever and severe sore throat, he/she may require home isolation and Oseltamivir
- In addition to all the signs and symptoms mentioned under Category-A, individuals having one or more of the following high risk conditions shall be treated with Oseltamivir:

  Children less than 5 years old;

  Pregnant women;

  Persons aged 65 years or older;

  Patients with lung diseases, heart disease, liver disease, kidney disease, blood disorders, diabetes, neurological disorders, cancer and HIV/AIDS

  Patients on long term cortisone therapy.

  No tests for H1N1 are required for Category-B (i) and (ii).

  All patients of Category-B (i) and (ii) should confine themselves at home and avoid mixing with public and high risk members in the family.

Category-C: (refer to higher center)

In addition to the above signs and symptoms of Category-A and B, if the patient has one or more of the following:

Breathlessness, chest pain, drowsiness, fall in blood pressure, sputum mixed with blood, bluish discolouration of nails, worsening of underlying chronic conditions.

All these patients mentioned above in Category-C require testing, immediate hospitalization and treatment including Oseltamivir.

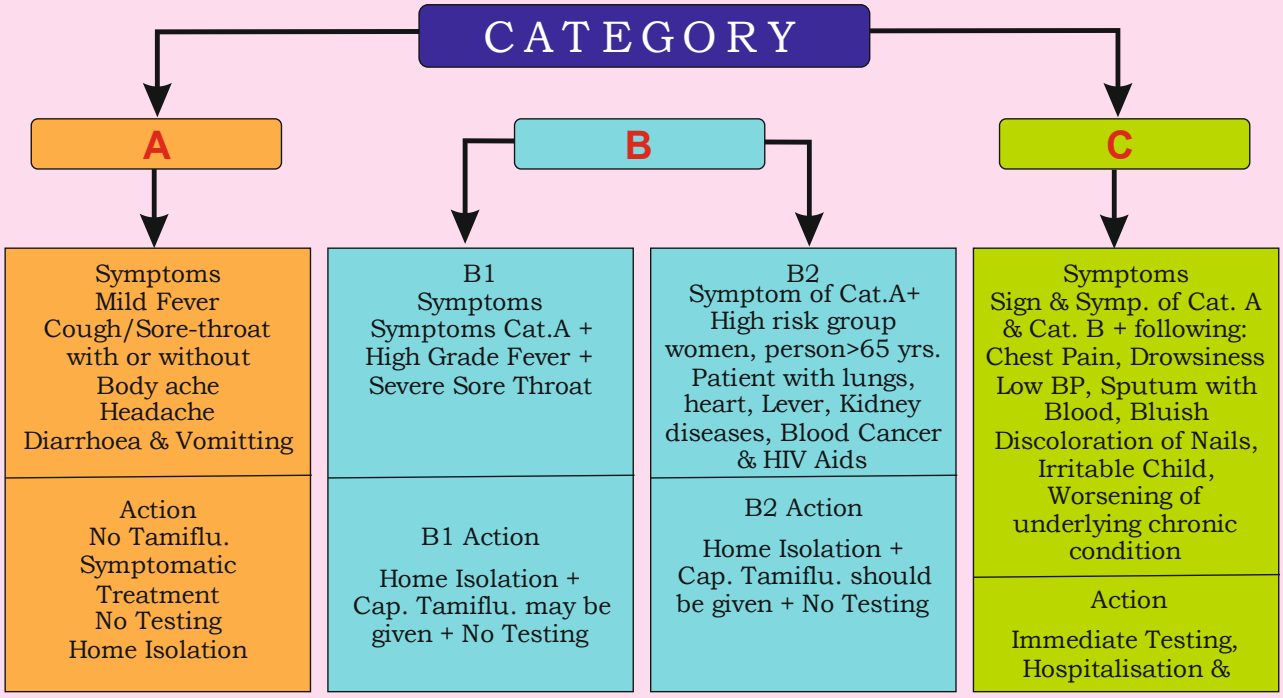
Preventive measures

- All the contacts need to self-monitor their health;
- Chemoprophylaxis to house hold contacts would be as per the policy decision taken by the Government which would be based on the severity of disease and stage of the pandemic.
- If there is community spread, then chemoprophylaxis of family and social contracts is not recommended. However, house hold contacts having comorbid condition should be put on chemoprophylaxis.

Infection Control

- The infection control practices listed in the guiding principles would be followed including frequent hand wash, cough etiquettes; maintaining arm's length from others;
- The contact surfaces would be disinfected by wiping , with sodium hypochlorite solution or with house hold bleach (5%) solution;
- Masks, tissue papers should be disposed off in dustbins. Hands should be washed after handling these wastes
- Utensils used by the case should not be used by others without washing
- Wash hands with soap and water before and after handling linens and towels used by the patient.

Swine flu Treatment Guidelines



Oseltamivir Medication

Oseltamivir is the recommended drug both for prophylaxis and treatment

Dose for treatment is as follows:

By Weight

For weight <15 Kg.	30 mg BD for 5 days
15-23 Kg	45 mg BD for 5 days
24->40 Kg	60 mg BD for 5 days
>40 Kg	75 mg BD for 5 days

for Infants

<3monghs	12 mg BD for 5 days
3-5 months	20 mg BD for 5 days
6-11 months	75 mg BD for 5 days

It is also available as syrup (12mg per ml)

If needed dose & duration can be modified as per clinical conditions

Chemoprophylaxis

ADULT	CHILD
*Cap. Oseltamivir 75 mg BD x 10 Days	*Oral suspension of Oseltamivir 2mg per Kg twice a day for 10 days (Each ml Contains 12 mg of Oseltamivir)

DO NOT PANIC :

Most Patients will experience only a mild illness. Severe illness may be seen only in some cases amongst high risk groups.

Who Need Vaccination	Laminations of Vaccine	High Risk Groups
* High risk groups * ICU & Emergency Medical Services personnel	* Take 2-3 weeks for seroprotection * immunity Usually lasts 6-12 months	* children < 5 years * Pregnant Women Those with heart/lung/chronic disorders

13

Varicella (Chicken pox)

Definition

Chicken pox is a mild exanthematous illness in most healthy children but can be a serious disease in neonates, immunocompromised, pregnant woman and even healthy adults.

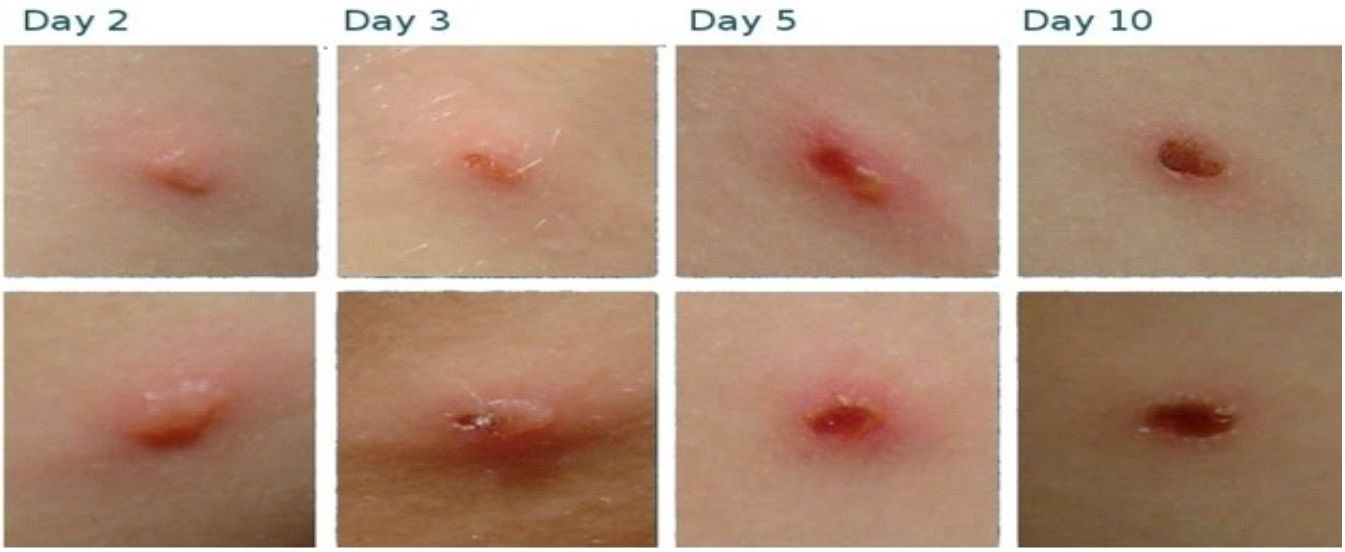
It is caused by varicella zoster virus (VZV) a DNA virus of herpes virus family. Virus is present in respiratory secretions and skin lesions of affected children and is transmitted by airborne spread or direct contact.

CLINICAL FEATURES

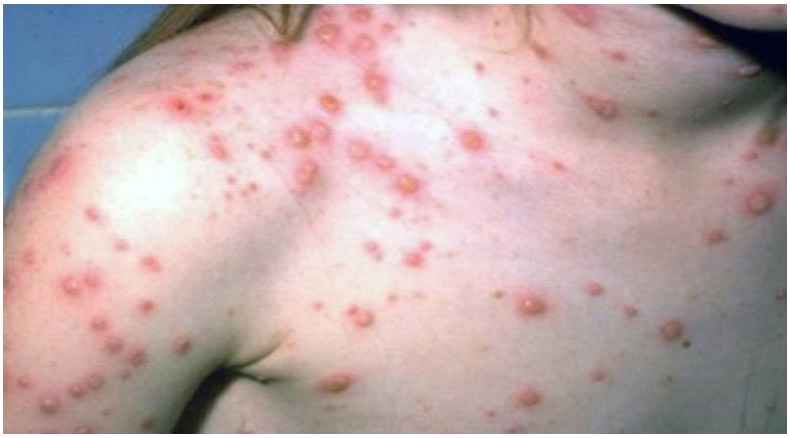
It is rarely subclinical. Peak age of disease is 5-10 years.

Prodromal period is short with fever, malaise, headache and anorexia. Rash appears 24-48 hr after fever first seen on trunk. The rash rapidly spread to the face and extremities. While it evolves into papules, clear fluid filled vesicle and then crusted vesicles many such crops may appear for 3-4 days.

Rash lasts 3-7 days and leaves behind hyper or hypopigmented macules that persists for days to weeks.



Progression of Varicella lesion



Varicella in different stages of development

COMPLICATIONS

(1) Secondary bacterial infections of skin lesions.

(2) Neurological complication leads to meningoencephalitis, acute cerebellar ataxia, transverse myelitis, G.B. Syndrome, optic neuritis etc.

(3) Thrombocytopenic purpura

(4) Congenital vericella syndrome// neonatal vericella.

(5) Risk of herpes zoster in immunocompromised children or children who acquire chickenpox in infancy.

DIAGNOSIS:

The diagnosis is clinical

D/D -Herpes Simplex

Insect bites

Drug reactions etc.

TREATMENT:

- Management is symptomatic and involves antipyretic, antipruritc agents with good hygiene.
- Oral acyclovir (20 mg/kg/dose) qid for 5 days.

PREVENTION

Varicella vaccine is live attenuated vaccine.

It is not included in our national programme.

IAP schedule: - two doses at 15-18 mo (minimum age 12 months) and 4-6 years

Varicella zoster immunoglobulin (VZIG) provides passive immunity to nonimmune individuals who are exposed to varicella e.g. pregnant women, immunocompromised children and adults.

The disease commonly is self-limiting in healthy children. Child should be excluded from day care or school till after 6th day of the rash or till scabs are formed.

14 Acute Encephalitis Syndrome/ Japanese Encephalitis

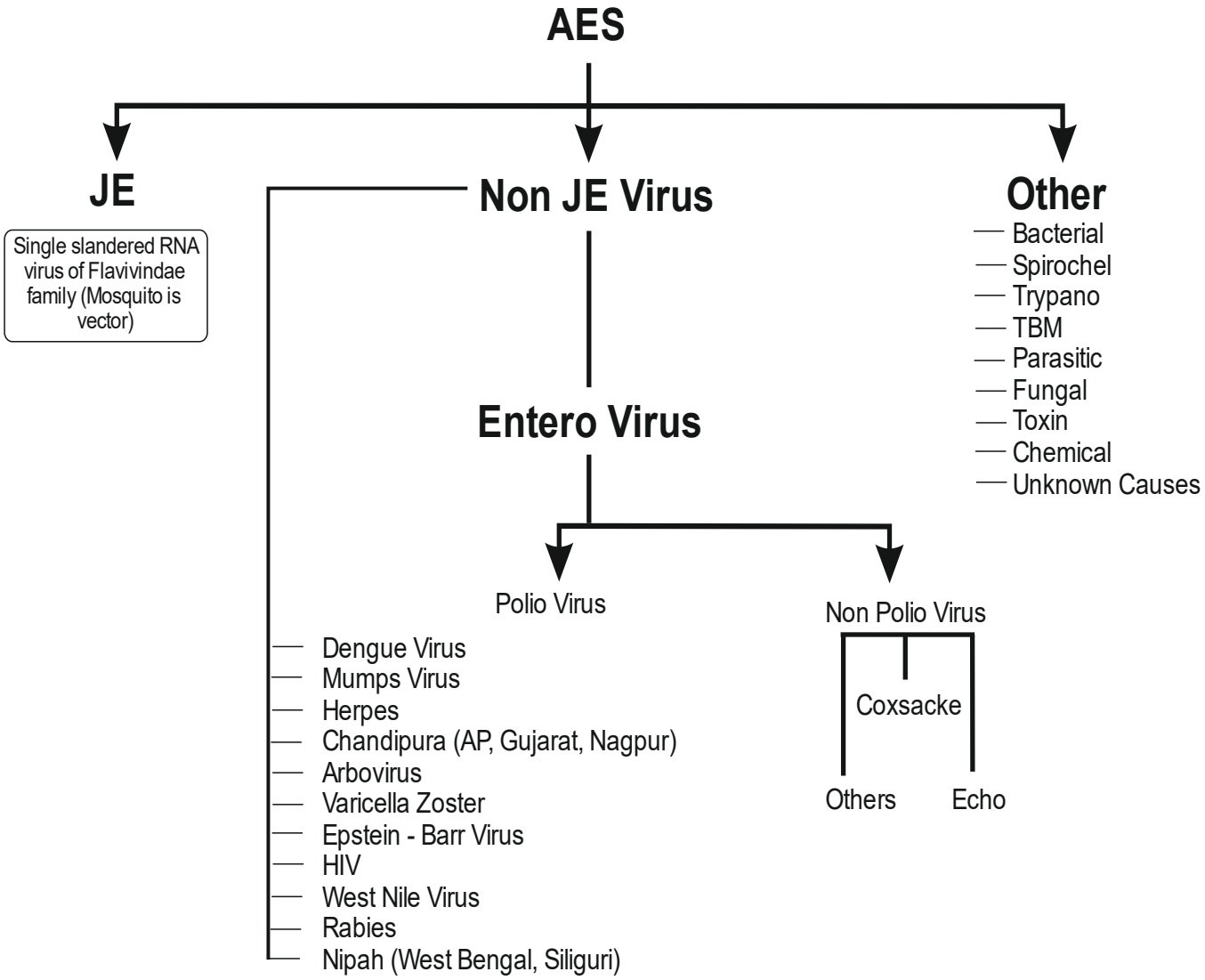
DEFINITION OF AES

As per (WHO) "Clinically a case of AES is defined as a person of any age, at any time of year with the acute onset of **fever and a change in mental status** (including symptoms such as confusion, disorientation, coma or inability to talk) AND/OR new onset of seizures(excluding simple febrile seizure)" . Other early findings may include an increase in irritability, somnolence or abnormal behavior greater than that seen with usual febrile illness.

DIFFERENCE BETWEEN JE/EV

Japanese Encaphalitis	Entero Viral Encaphalitis
1. Route-Vector Borne (Mosquito)	1. Eco-oral route (Water Borne)
2. Fever- High Grade, Change in behaviour	2. Fever with diarrhoea or common cold
3. Headache, vomiting	3. Cough, Breathlessness,Palpitation
4. Irritability, dystonia, rigidity, tremor	4. Generalized, facial, abdomen swelling
5. Convulsion	5. Floppiness, lethargy, drowsy, convulsion.
6. Paralysis	6. Oligourea, hepatosplenomegaly, skin rash.
7. Altered sensorium	7. Multi system/oragan involvement(GI Lever, heart, brain and lungs)
8. Incbation Period - 4 to 14 days	8. Incubation period - 3 to 6 days

Causes of AES



Symptoms	Signs
1. Fever, headache, nausea, emesis, diarrhoea	1. Anaemia, jaundice, oedema, anasarca.
2. Myalgia, abdominal pain, irritability, rash	2. Signs of dehydration/shock
3. Cold/cough, breathlessness, chest pain-EV	3. Signs of CHF/myocarditis.
4. Fatigue, throat pain, change in behaviour	4. signs of ICT-asymmertric pupil, tonic posturing, papillocedema, signs of herniation
5. Icterus, pallor, GI bleed (EV)	5. Hepatomegaly, splenomegaly
6. Tremor, dystonia, rigidity (JE).	6. Chest sign
7. Lethargy, convulsion, altered sensorium drowsy, coma, paralysis	7. CNS-altered sensorium, signs of meningeal irritation, Cranial nerve palsy.
9. Distension of abdomen	9. Motor paralysis (hemiplegia, quadriplegia)

Investigations

- CBC, urine, LFT, KFT, Bl sugar, S. electrolyte, test for malaria and Widal test, stool & sera for virus.
- CSF examination-for routine & viral studies
- X-ray/CT scan/MRI/ECG/Cardiac enzyme

Condition	Pressure	Cells (WBC)	Protein	Glucose(CSF-Nelson)
Normal	50-80	<5 cells (lymphocyte)	20-45	>50 (50%BSL)
Ac.Bact. meningitis	↑100-300	>100-10000 (polymorphs)	100-500	(↓<40/50%BSL)
PTPM	Normal or↑	5-10000 (polymorphs)	100-500	Normal/↓
Viral meningo-encephalitis	Normal or 80-150	Rarely>1000, Early-polymorphs, late mono nuclear	50-200	Normal/↓
TBM	Usually↑	10-500 Early-polymorphs late mono nuclear	100-300	<50

Treatment of AES

- Mainly supportive/symptomatic-ABC/VITAL stabilize.
- General management/prevention of aspiration-positioning-prone/semi prone
- Control ICT/cerebral edema - head elevation /normothermia/ hyperventilating oxygen drugs-20%mannitol iv 5ml/kg stat then2.5ml/kg 6hrly(C/I -dehydration/CHF/pulm. edema),glycerol 0.5ml/kg through RT, Dexamethasone(IV)-controversial 0.5mg/kg, Frusemide-1.0mg/kg.
- Indication of ventilator support-Deteriorating GC.
- Shallow resp./severe resp. distress/feeble heart sound.
- Dusky colour of blood/cyanosis of patient not improved.
- Needs conti. Bag & Mask/CRT not improved/ABG para.

- *Initial Tt-quick assess vitals (resp./cvs)/gentle oral]suct/clear nose O_2 inhale/nil orally/IVF/RTS/position-prone or semi prone.*
- *Sample taken for CBC/ABG etc./Bl. Sugar (dext.)/imperical antib. Benzodiazepines-Diaz./lorz./midz.(0.1mg/kg)-slow(IV).*
- *Loading-phenytoin-10-30mg/kg (of 10mg/kg)-slow(IV) 3-9mg(M).*
- *Loading-phenobarbitone-15-20 mg/kg. 3mg/kg. (M).*
- *Constant IV infusion-Midazolam 0.2 mg/kg [20-40 Ugm/kg/hr.)*
- *Thiopental 2-4mg/kg/paraldehyde/GA.*

Live, attenuated JE vaccine (SA 14-14-2 vaccine)

Live, attenuated JE vaccine (SA 14-14-2 vaccine)

Current Schedule

— Dose 0.5 ml sub-cutaneously on left upper arm
— Single dose (80-99%)
— Two doses (More than 99%)
— Between 1 –15 years of age
— After introduction :
— Age – 1-2 years

Vaccination should be completed in the community at least one month before anticipated rise in incidence.

Prevention from AES

- Vaccination (JE).
- Vector (mosquito) control.
- Wearing full cloths.
- There should not be any water logging.
- Pig-amplifying host , to be controlled.
- Pour *Gumbusia* fish (mosquito larva eating fish) in pond/well.
- Stagnant water – kerosene oil. Use mosquito net .
- Use *Neem* leaves to be fumed in the evening.
- Well cooked and fresh meal.
- Use India Marka II hand pump.
- Use toilets/safe personal hygiene/proper hand washing.
- Safe drinking water.

SEQUELAE OF AES/JE

1. MENTAL	- Mental retardation(cognitive function alter
	- Speech/hearing/Visual disability
	- Convulsion.
	- Paralysis , rigidity, tremor.
2. BEHAVIORAL	- Unusual/Excessive cry or laugh
	- Abusing
	- Unusual running
3 PSYCHO- SOCIAL	- Bladder /bowel dysfunction
	- Excessive salivation

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