

Proposed
Inpatient department common paediatric cases management

Professor ARM Luthful Kabir

Professor of Paediatrics

Dr. M Quamrul Hassan

Assistant Professor of Paediatrics

And

Dr. Md. Al-Amin Mridha

Registrar

Faculty of paediatrics

Institute of Child and Mother Health

Matuail, Dhaka-1362.

Pneumonia

Common causative organisms: Streptococcus pneumoniae
Haemophilus influenzae
Staphylococcus aureus

Diagnosis:

History:

- Fever
- Cough or difficulty in breathing
- Feeding difficulty

Examination:

- Tachypnoea (increased respiratory rate)
- Signs of respiratory distress (Flaring of the ala nasae, suprasternal, intercostal and subcostal recession)
- Cyanosis
- Weigh the child
- Temperature
- Tracheal position
- Dull on percussion
- Bronchial breath sound, and increased vocal resonance over the consolidation, if any.
- There may have crepitation

Investigations:

- a) Blood:
Total count of WBC- leucocytosis
Differential count of WBC- neutrophilia
- b) X-ray chest: Homogenous opacities or patchy opacities
- c) Blood culture (if possible) may isolate the organism

Treatment:

General:

- Breastfeeding or nutritional support by usual diet
- Keep the baby in well ventilated room
- Clear the blocked nose

Symptomatic:

Paracetamol- 15-20 mg/kg/dose 4-6 hourly if fever is present

Oxygen inhalation if the child has

- Cyanosis
- Restlessness
- Respiratory rate- $> 70/\text{min}$ (if age $< 2\text{mo}$)

Specific:

Antibiotics:

< 2 months of age

Inj. Ampicillin- 200 mg/kg/day in 4 divided dose for 7 days

Inj. Gentamicin- 5 mg/kg single daily dose for 7 days

< 2 months of age

Inj. Ampicillin- 200 mg/kg/day in 4 divided dose for 7 days.

If the pneumonia is less severe & the patient can take orally then oral cotrimoxazole or amoxycillin or cephalexin can be given.

or Inj. Procaine penicillin 50,000iu/kg once daily IM for 7 days.

Referral to tertiary care centre / Paediatrician:

Following complications need referral-

- a) Empyemathoracis
- b) Pneumothorax
- c) Unresolved collapse-consolidation
- d) Lung abscess
- e) Bronchiectasis

Bronchiolitis

Common causative organisms: Respiratory Syncytial Virus (RSV)- Commonest
Parainfluenza virus
Adenovirus

Diagnosis:

History:

- Age 2 months to 2 years, peak age 6 months
- Preceding history of coryza
- Low grade fever
- Feeding difficulty
- Noisy respiration
- Restlessness

Examination:

- Running nose
- Tachypnoea
- Signs of respiratory distress (Flaring of the ala nasae, suprasternal, intercostal and subcostal recession)
- Bloated Chest
- Cyanosis
- Temperature
- Tracheal position
- Hyperresonance on percussion
- Vesicular breath sound with prolonged expiration.
- Wheeze with a few crepitation on the both lung fields
- Liver and spleen may be palpable due to down ward pushing by inflated lungs.

Investigations:

- a) Blood:
- TC of WBC- usually normal
 - DC of WBC- normal
 - Hb%- normal
 - ESR- normal
 - CRP- (C- Reactive protein)- normal
 - Oxygen saturation by pulse-oxymetry- low
- b) X-ray chest:
- Hyper translucency, hyperinflated lung fields
 - Increased interstitial markings
 - Horizontal ribs with low flat diaphragm

Treatment:

General:

- Feeding /breastfeeding
- Keep the baby in well ventilated room
- Head up position

Symptomatic:

Paracetamol- 15-20 mg/kg/dose 4-6 hourly if fever is present

Nebulization 6 hourly by salbutamol 0.03ml/kg/dose

+ Ipratropium bromide 250mg/ml/dose + normal saline 2 ml

Clear the blocked nose and OP suction.

Oxygen inhalation

Indication of antibiotic-

- Very sick child
- High fever
- Leucocytosis
- Radiological change, like consolidation

Specific: Antiviral (Ribavirin) in selective cases

Referral to tertiary care centre / Paediatrician:

Following complications need referral-

- a) Very sick child
- b) Need ICU
- c) Combined with collapse-consolidation

Bronchial Asthma

Triggering Factors:

- Dust
- Too hot, too cold foods
- House dust mites
- Exercise
- Animal dander
- Pollen
- Drugs like aspirin

Diagnosis:

History:

- Recurrent attack of respiratory distress or cough or wheeze (whistling sound arising from chest not from throat or nose)
- Night cough
- Night cough awakening
- Family history of asthma or atopic diseases (allergic rhinitis, allergic conjunctivitis and atopic dermatitis) in the family or atopic diseases of the child.
- Long term cough without any apparent cause

Examination:

- Tachypnoea
- Signs of respiratory distress (Flaring of the ala nasae, suprasternal, intercostal and subcostal recession)
- Cyanosis
- Normal temperature
- Tracheal position
- Hyper resonance on percussion
- Vesicular breath sound with prolonged expiration.
- Bilateral diffuse wheeze

Investigations:

- a) Blood: TC - normal, DC - may be eosinophilia, Hb%- normal, ESR- normal
- d) X-ray chest:
 - Hyper inflated lung fields with low flat diaphragm
 - Tubular heart
- b) Serum IgE- may be high
- c) Lung Function Test (LFT) if age > 8 years
 $\frac{FEV_1}{FVC} = < 80\%$ of personal best

Reversibility Test – FEV1 > 12 % or 200 ml increased after bronchospasmolysis test

Treatment:

General:

- Breastfeeding and nutritional support
- Head up position

Symptomatic:

Oxygen inhalation

Specific: Nebulization 6 hourly by salbutamol 0.03ml/kg/dose of any age and Ipratropium bromide 250mg/ml/dose can be added if the age of the child is more than 2 years

Inj. Hydrocortisone 4-5mg/kg/dose 6 hourly for 1-2 days followed by tab. prednisolone 1-2mg /kg/day in 2 divided doses or single morning dose for 3-14 days

Avoidance of triggering factors

Referral to tertiary care centre / Paediatrician:

Following complications need referral-

- a) Persistent bronchial
- b) Refractory asthma
- c) Asthma which needs ICU care

Congenital heart disease

Diagnosis:

History: Recurrent history cough/ difficult breathing
Fatigue on feeding/ exertion
Excessive sweating on feeding and taking longer time to finish feeding
May have bluish colouration of the face or whole body
Not growing well

Examination:

Weigh the child
Clubbing
Tachypnoea
Signs of respiratory distress (Flaring of the ala nasae,
suprasternal, intercostal and subcostal recession)
Conjunctival injection
Bulged praecordium and hyperdynamic
Cyanosis
Temperature
Tachycardia
Apex beat may be shifted
Thrill may be present
Usually pansystolic murmur can be heard at the praecordium
Basal crepitation
If heart failure, then
Tachypnoea
Tachycardia
Cardiomegaly
Enlarged tender liver
Oedema

Investigations:

- X-ray chest- Size and shape of the heart
Pulmonary plethora or oligaemia
- ECG- Biventricular hypertrophy
- Echocardiogram and colour Doppler- VSD and others.

Treatment

General: Breastfeeding and nutritional support

Symptomatic: Oxygen inhalation
Head up position/ Propped up position
If heart failure then,
Oxygen inhalation
Propped up position
Inj. Frusemide 2mg/kg/dose IV
Inj. Digoxin calculated dose

Specific: Small VSD close spontaneously other need surgical intervention

Referral to tertiary care centre / Paediatrician:

- a) Large VSD, VSD with heart failure
- b) ASD after 2years
- c) PDA (not responding to medical therapy as in premature baby)
- e) Cyanotic heart diseases eg- TOF

Febrile convulsion

Definition: Generalised convulsion due to rapid rise of temperature resulting from extra cranial infection.

Diagnosis:

History: Fever
Age: 6 months to 5 years
Generalised convulsion
Short duration
Complaints of primary infection (throat pain, drooling of saliva, frequency of micturition)

Examination:

Weigh the child
Temperature: high
Ear, Nose, throat should be examined
Fontanellae: Normal
Signs of meningeal irritation- nuchal rigidity, Kernig sign.

Investigations:

a) Blood:
CBC - neutropillic leucocytosis
CRP- raised
Urine- R/E & C/S
CXR- may have pneumonia
CSF analysis- should be done in 1st convulsion,
or in doubtful cases .
Blood culture

Treatment:

General: Breastfeeding and nutritional support
Air way clear

Symptomatic: Convulsion is controlled by per rectal Inj. Diazepam
0.5mg/Kg /dose during convulsion and oral Diazepam
0.3- 0.5mg/kg/Day in 3 divided dose for 3-5 days.
Paracetamol- 15-20mg/kg/dose orally or per rectally
Tepid sponging

Specific: Antibiotics
Counselling with the parents that it is a benign disease

Referral to tertiary care centre / Paediatrician:

- a) Complex febrile seizure
- b) Recurrent convulsion
- c) A febrile seizure

Pyogenic meningitis

Common causative organisms: H influenzae
Meningococcus
Pneumococcus
E coli

Diagnosis:

History: Age of the Child
Fever
Convulsion
Feeding difficulty

Examination:

Weigh the child
Temperature- high
Bulged Fontanellae
Nuchal rigidity
Kernig sign

Investigations

- a) Blood:
CBC - neutrophilic leucocytosis
CRP - high.
- b) CXR- consolidation
- c) CSF analysis
Colour- hazy, turbid and rarely clear.
Cell count- neutrophilic leucocytosis (normal 0-5cells/cmm)
Sugar- low (normal 40-80mg/dl)
Protein- raised (normal 15-40mg/dl)
Gram stain-
Gram-positive cocci- Pneumococcus
Gram-negative intracellular cocci- Meningococci
Coccobacilli- H influenzae
Bacterial antigen
CSF- culture
- d) Blood culture

Treatment:

General- Nutritional support
Maintenance of fluid

Symptomatic- Convulsion is controlled by Inj. Diazepam 0.3-0.5 mg/kg/dose per rectum then maintenance
-Fever: Paracetamol 15-20mg/kg/dose 6 hourly
-Hypoglycaemia: 10% glucose 4 ml/kg/dose I/V then maintenance

Specific:

Inj. Ampicillin 400mg/kg/day in 4 divided doses plus

Inj. Chloramphenicol 100mg/kg/day in 4 divided doses

or

Inj. Ceftioxone 100mg/kg/dose single daily dose. Antibiotic should be continued until 5 days after abatement of fever.

Inj. Dexamethasone 0.15 mg/kg/dose 6 hourly for 2 days

Referral to tertiary care centre / Paediatrician:

a) Hydrocephalus: drug treatment and Surgical consultation

b) Palsy: Physiotherapy

c) Epilepsy: Antiepileptic drugs

d) Subdural effusion: May need subdural tap

e) Mental retardation

f) Learning deficit

g) Vision and hearing problem

Encephalitis/Cerebral malaria

Common causative Organisms:

Virus- Herpes Virus, mumps, measles virus

Parasites- Malarial parasites

Diagnosis:

History:

Unconsciousness of recent onset

Focal or generalised convulsion

High fever in case of malaria in the malarial area

History of coryza, malaise, myalgia, bodyache

History of poisoning, drug ingestion or trauma.

Examination:

Varying grade of unconsciousness: drowsy/ stupor/ coma

Decorticated/ cerebrated posture

Herpetic vesicles or lesion usually in the face

Usually high temperature

Pupil size and reaction to light

Cranial nerve involvement

Limbs- sensory/ motor involvement

Signs of meningeal irritation- Nuchal rigidity, kernig sign

Investigations:

a) Blood

Blood count- normal

Blood film-thick & thin film to identify malaria

b) Urine R/M/E & C/S

c) X-ray chest

d) CSF analysis:

Colour- clear.

Cell count- normal (normal 0-5cells/cmm)

Sugar- normal (normal 40-80mg/dl)

Protein- normal (normal 15-40mg/dl)

Gram stain- no bacteria present

Bacterial antigen- negative

CSF- culture- negative

g) Electrolytes- delusional hypornatraemia

h) Blood Sugar, Blood urea, S. creatinine

Treatment:

General:

- Maintain nutrition by IV fluid or NG feeding
- Changes of posture 2 hourly
- Care of bowel and bladder

Symptomatic:

Paracetamol to reduce fever
Diazepam to control convulsion
IV glucose to prevent hypoglycaemia

Specific:

Inj. Jasoquine 20mg/kg bolus IV in isotonic fluid (5-10ml/kg)
over 3-4 hour then 10mg/ Kg /dose IV 8 hourly until consciousness
regain and then oral Jasoquine 10mg / Kg/dose 8 hourly, total 5-7 days

Inj. Acyclovir 10 mg /Kg/ dose IV 8 hourly for 10 days

Referral to tertiary care centre / Paediatrician:

- a) Focal paresis/ palsy- Physiotherapy
- b) Epilepsy: Antiepileptic drugs
- c) Mental retardation
- d) Learning deficit
- e) Vision and hearing problem
- f) Behavioural problem

Enteric Fever

Causative organism: Salmonella typhi and Salmonella para typhi

Diagnosis:

History: Fever
Headache
Poor feeding
Abdominal pain

Examination: Weigh the child
Toxic look
Coated tongue
Truncal rash
High temperature
Abdominal tenderness
Hepatosplenomegaly
Liver dullness may be obliterated
Bowel sound

Investigations: a) Blood:
TC of WBC- leucopenia
DC of WBC- relative lymphocytosis
Blood Culture- in 1st week
Widal test - beyond 1st week
Urine for R/M/E & C/S
CXR- consolidation.

Treatment:

General:

- Nutrition support
- Care of mouth

Symptomatic: Paracetamol to reduce temperature
IV fluid

Specific:

Antibiotic:

Cotrimoxazole- 5 mg/kg/dose in term of trimethoprim 12 hourly
for 14 days.

Ciprofloxacin 10mg/kg/dose 12 hourly for 14 days

Ceftriaxone 100mg/kg/single daily dose for 10 days

Cefixim 10mg/kg/dose 12 hourly for 10 days

Referral to tertiary care centre / Paediatrician:

- a) Perforation-Nothing per oral
-IV fluid antibiotic
-Surgical consultation
- b) Carrier state if require surgery
- c) Other complications

Prevention:

Hand washing before taking food and after coming from toilet.

Safe water drinking

Vaccination

Treatment of carrier state:

Amoxicillin 50mg/kg/day in 3 divided dose for 10 days

May require cholecystectomy

Urinary Tract Infection (UTI)

Common causative organism: E coli

Diagnosis:

History: Fever
Frequency of micturition
Painful micturition
Abdominal pain
Not growing well

Examination:

Weight
Height
Temperature may be raised
Supra pubic tenderness
Tender renal angle

Investigation:

Blood count
Urine R/M/E and C/S with colony count

Treatment:**General:**

- Nutrition support
- Plenty water to drink

Symptomatic: Paracetamol to reduce temperature
Regular evacuation of bowel habit

Specific:

Antibiotic:

Cotrimoxazole- 5 mg/kg/dose in term of trimethoprim 12 hourly
for 7 days.

Cephradine 50mg/ Kg/day in 3 divided dose for 7days
Ciprofloxacin 10mg/kg/day 2 divided dose for 7days

Referral to tertiary care centre / Paediatrician:

- a) Recurrent UTI
- b) UTI below the age of 5 years

Severe Malnutrition

Diagnosis:

History: Detailed dietary history
Milk formula feeding
Early weaning/ late weaning
Diluted formula feeding
Discontinuation of breast-feeding
Recent history of diarrhoea, pneumonia and other infections
(measles, pertussis, Tb)
Poor illiterate parents

Examination: Take weight and height/length of the child
Growth retardation that is low weight for age or
weight for height.

Wasting
With or without oedema
Pallor
Glossitis, angular stomatitis
Hair change- Sparse, lustreless, thin, easily pluckable
hair, flag sign.
Eye changes- Conjunctival xerosis, Bitot spot, corneal xerosis,
corneal, ulceration and opacities.
Skin changes- cold clammy skin, loose nonelastic, hanged skin specially
at buttock. hyperpigmentation, hypopigmentation
desquamation and ulceration
Hypothermic, sometimes features of shock.

Investigations:

- a) Blood
 - CBC – neutrophilic leucocytosis if infection
 - Hb- will be low
 - ESR- high
- b) Urine for R/M/E and C/S
- c) Blood sugar level- low (<3mmol/L in case of hypoglycaemia)
- d) X-ray chest: microcardia
- e) MT

Treatment:

- 1) Immediate resuscitation to combat-
 - Hypothermia: by covering the body
keep the child in warm wrapping with cloths/by using fan heater
 - Hypoglycaemia: 4ml/Kg of 10% glucose IV stat or 50 ml 10% glucose
through nasogastric tube where IV administration not possible.
Early feeding
 - Dyselectrolytemia: ORS by mouth or ReSoMal by mouth
 - Vitamin A deficiency: If age < 6month then 50,000 iu once
6-12 month then 1 lac unit once

>12 month then 2 lacs unit once

One dose for malnutrition and three dose if eye sign of vitaminA deficiency present.

- Control of infection by antibiotic, inj. ampicillin 200mg/kg/day +
inj. gentamicin 5mg/kg/day
- Severe anaemia (<4mg% of Hb) needs blood transfusion

2) Feeding-

Round the clock calculated nasogastric tube feeding should be started as early as possible.

Fluid- 100ml/kg/day initially and can be increased later on

Calorie- 110kcal/kg/day

2 hourly 12 divided feeding

Preparation: For each feeding milk should be given 1 teaspoonful to 1 ounce (30 ml) water, rest of the calorie should be calculated by adding sugar and soyabin oil (1 tsf powder milk=whole cows milk= 20 kcal, 1 tsf sugar= 20 kcal and 1 tsf soyabin oil= 45 kcal)

Nasogastric tube should be withdrawn if the child can take three-quarter of calculated feed by orally.

3) Micronutrients supplementation

- Potassium: 3mEq/Kg/day (1 tsf= 10mEq)
- Zinc: 1-2mg/Kg/day (1 tsf= 10mg)
- Magnesium: 2-3 mg/Kg/day (1 tsf= 50mg)
- Multivitamin can be given daily 1 ml twice daily
- Iron should be given (6mg/Kg/day) from 2nd week of initial phase.

4) Mother or care giver should be taught regarding feeding to be continued at home

5) If not possible to follow above management then refer the child to tertiary care centre

Haemolytic Anaemia

Diagnosis:

History: Age- usually above 6 months
Consanguinity between parents
Progressive pallor
Previous history of blood transfusion
Not growing well.

Examination: weight
Height
Pallor
Jaundice
Thalassemic facies (frontal bossing, depressed nasal bridge,
malar prominence and malocclusion of teeth)
Hepatosplenomegaly

Investigation:

Blood count- Normal
Hb%- Low
Blood film- Anisopoikilocytosis with
hypochromic-microcytic RBC's. There are some
schistocyte, target cells, nucleated RBC's and a few
macrocytes. WBC's are mature and normal count.
Platelets count normal.
X-ray of hand and skull lateral view
Serum Iron
Serum ferritin, TIBC
Osmotic fragility test
Haemoglobin electrophoresis

Treatment:

General:

Nutrition support
Avoid iron rich food
Zinc supplementation

Symptomatic: Repeated packed blood cell transfusion
Iron chelating agent Inj. Desferol
Antibiotic if infection

Specific:

Bone-marrow transplantation

Referral to tertiary care centre/ Paediatrician:

- a) To establish diagnosis
- b) To assess endocrine function

Iodine Deficiency Disorder (IDD)

Diagnosis:

History: Geographical location, mountainous areas, family history
swelling of the anterior aspect of the neck

Examination: Palpation of goitre

Table: Classification of goitre (WHO classification)

Grade 0	No palpable or visible goitre
Grade 1	A mass in the neck that is consistent with an enlarged thyroid that is palpable but not visible when the neck is in a normal position. It moves upwards in the neck as the subject swallows
Grade 2	A swelling in the neck that is visible when the neck is in normal position and is consistent with an enlarged thyroid when the neck is palpated

Investigations:

- USG of the thyroid gland
- Serum T₃, T₄, TSH estimation
- Radioiodine uptake
- Urinary iodine excretion (normally 90% iodine is excreted through urine)

Treatment

Iodized salt
Sodium-L-thyroxine

Nephrotic Syndrome

Diagnosis:

History:

Age 2 – 10 years
Generalised swelling
Scanty normal coloured urine
May have recurrent history of swelling

Examination:

Weight
Body surface area (Wt in Kg \times 4 + 7/90+ Wt in Kg)
Blood pressure- normal
Oedema, including scrotal/ labial swelling
Ascites
Anasarca

Investigations:

- a) Urine- Appearance/colour- normal or frothy
Albumin- +++ (massive proteinurea)
RBC- nil
Pus cell- may be present
Cast- hyaline cast may be present
Urine- culture and colony count
UTP- $>1\text{gm/m}^2/\text{day}$ (Nephrotic range of proteinurea)
- b) Protein: Creatinine ratio- > 3 indicate nephrotic range of proteinurea
- c) Serum Albumin= < 2.5 gm/dl
- d) S. Cholesterol = > 220 gm/dl
- e) S. Electrolytes
- f) Blood count, blood urea, creatinine/ BUN
- g) CXR- to exclude pulmonary infection/ effusion
- h) HB_sAg
- i) CBC and ESR

Treatment:

General:

- Diet: liberal diet/salt restricted
- Maintain intake-output chart, albumin and weight chart

Symptomatic:

- For huge ascitis: diuretics – spironolactone and frusemide
25% human albumin 0.8- 1g/kg IV
- If infection (UTI, peritonitis, septicaemia, skin infection)
- antibiotics
- Abdominal pain with fever
Inj. Penicillin 2 lac/Kg/day in 4 divided dose for 7 days
- H₂ blocker/ antacid during steroid therapy

Specific:

- Standard Prednisolone therapy (SPT): 60mg/m²/day in 3 divided dose for 6 weeks followed by 40mg/m² alternate day single morning dose for 6 weeks.
- Counselling:
 - Recurrent attack
 - No deterioration of kidney function
 - Good prognosis. There is high chance of cure at the end of second decade

Referral to tertiary care centre / Paediatrician:

- a) Nephrotic syndrome with hypertension, haematuria and infection
- b) If age below 2years and above 10years
- c) No response to standard prednisolone therapy

Acute glomerulonephritis (AGN)

Mainly post streptococcal (either skin infection or throat infection) sequelae.

Diagnosis:

History: Scantly high colour urine
Puffiness of the face
Swelling of the whole body
May have- Headache
Vomiting
Blurring of vision
Breathing difficulty
Convulsion

Examination:

Weight
Body surface area ($Wt \text{ in Kg} \times 4 + 7/90 + Wt \text{ in Kg}$)
Blood pressure- Usually high
Puffiness of the face or eyelid swelling
Oedema
May have heart failure
Tachycardia
Tachypnoea
Enlarged tender liver
Basal crepitation
Impairment of consciousness.

Investigations:

- a) Urine for R/M/E
Smoky or coco cola colour
Albumin present- +/++
Plenty RBC and RBC cast
A few pus cells.
- b) Blood urea/BUN- raised
- c) Serum creatinine- raised
- d) X-ray chest- may have cardiomegaly
pulmonary oedema.
- e) ECG- hyperkalaemia
- e) ASO titre – may be raised

Treatment

General: -Bed rest
-Salt and protein restricted
-Potassium and potassium containing foods and fruits restricted.
-Restriction of fluid $400 \text{ ml/m}^2 / \text{day} + \text{previous day output}$
-Maintain intake-output chart, albumin, weight and BP chart

Symptomatic: Hypertension – Diuretics and/or antihypertensive drugs
Heart failure - a) Diuretics
b) Digoxin
c) Bed rest

Specific: -Tab. penicillin 50mg/Kg/ day in 4 divided dose for 10 days.

Referral to tertiary care centre / Paediatrician:

- a) Acute renal failure
- b) Heart failure
- c) Volume overload
- d) Hyperkalaemia
- e) Hypertensive encephalopathy