

Chapter: Pediatric Medicine

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Stages of life

1. Antenatal- conception to labour pain.
2. Natal- labour period to birth.
3. Perinatal – from delivery to 28 completed days after birth.
4. Neonate 0-28 days
5. Infant 1 month-1 year
6. Toddler 1-3 years
7. Preschool 3-5 years
8. School 5-18 years
9. Adolescent 10-18 years (early 10-14 years and late 15-18 years)

What are the histories and clinical examination should be done in neonates?

A) Birth history

Antenatal history

1. Issue
2. Number of pregnancy
3. Antenatal check up-regular/irregular/none
4. DM-present/absent
5. Hypertension-present/absent
6. TT-complete/incomplete/nil

Perinatal history

1. Date of delivery
2. Time of delivery
3. Mode of delivery- NVD/C/S
4. Place of delivery-home/hospital/clinic

5. Gestational age-term/preterm (<37 weeks)
6. Prolonged labour(>12 hours)-yes/no
7. PROM-yes/no
8. Fever before delivery-yes/no
9. Resuscitation-yes/no

Postnatal history

1. Delayed crying-yes/no
2. Convulsion-yes/no

B) Feeding history

1. Prelacteal food-water/honey/cow's milk
2. Exclusive breast feeding-yes/no

On examination

1. General condition-normal/alert/ill looking/excessive crying/lethargic/gasping/coma.
2. S/C-pink/central pink/pale/peripheral cyanosis.
3. Heart rate- normal 100-160 beats/minute.
4. Respiratory rate-normal 30-59 breaths/minute.
5. Temperature-N/W/increased
6. Capillary refilling time- normal <3 seconds
7. Brachial pulse volume-adequate/not
8. Tone-normal/hypo/hypertonic
9. Reflex-good/moderate/poor
10. Anemia-present/absent
11. Cyanosis-present/absent
12. Jaundice-present/absent
13. Pupil-reacting/not reacting to light/dilated/constricted
14. Fontanelle-normal/bulged/depressed
15. Umbilicus-healthy/unhealthy
16. Heart-normal first and second heart sounds, rhythm regular, no murmur, no pericardial rub.
17. Lungs-clear/creps/ronchi

18. Active convulsion-present/absent

Choice of fluid and amount of fluid calculation

Day	Name	Amount (ml/kg/day)	
		Preterm	Term
1 st Day	10% DA (infusion body weight <1500 gram then 5% DA)	80 ml	60ml
2 nd Day	10% DA + 0.225%NS	100 ml	80 ml
3 rd Day	”	120 ml	100 ml
4 th Day	”	140 ml	120 ml
5 th Day	”	160 ml	140 ml
6 th Day	”	170 ml	150 ml
6 th day to 28 days	”	150 ml	
>28 days and <40kg	1 st 10 kg :100 ml/kg/day 2 nd (11-20)kg : 1000 ml+50 ml /kg/day >20 kg :1500 ml+ 20 ml/kg/day (Maximum 2400 ml fluid can be given in old child)		

20% fluid should cut in following condition

1. Meningitis
2. Encephalitis
3. Septicaemia

4. Severe pneumonia
5. Heart failure
6. PNA with HIE stage I, II, III

20% fluid should add in following condition

1. Preterm baby
2. Baby in warmer
3. Baby in phototherapy
4. Hypernatraemia

Calculation of drop and micro drop of fluid

1 ml of fluid=15 drops

1 drop=4 micro drops.

Following equation will help to determine the drop and micro drop

- $\text{Drop} = \frac{\text{Fluid in ml}}{4 \times \text{hours}}$

- $\text{Micro drop} = \frac{\text{Fiuid in ml}}{\text{hours}}$

Case history: A neonate of 12 hours age (term delivery), weight 3 kg admitted in neonatal ward. Calculate the amount of fluid will require in 24 hours and rate of infusion in drop/micro drop.

Answer: Total fluid requirement 180 ml.

- $\text{Rate of infusion in drop} = \frac{\text{Fluid in ml}}{4 \times \text{hours}} = 180/4 \times 24 = 1.87 \text{ (roughly 2) drops/minute.}$

- $\text{Rate of infusion in Micro drop} = \frac{\text{Fiuid in ml}}{\text{hours}} = 180/24 = 7.5 \text{ (roughly 8) micro drops/minute.}$

Maintain of nutrition of neonate

1. Gestational age <30 weeks, birth weight <1.2 kg-IV fluid.
2. Gestational age 30-34 weeks, birth weight 1.2-1.8 kg-cup spoon feeding/NG feeding.

3. Gestational age >34 weeks, birth weight >1.8 kg-can allow breast feeding, if otherwise healthy.

Calculation of blood transfusion

1. If Hb >8 gm/dl then no blood transfusion.
2. If Hb <8-5 gm/dl then blood transfusion at 20 ml/kg body weight
3. If Hb <5 gm/dl then blood transfusion at 10 ml/kg body weight

For each 20 ml of blood 3 ml anticoagulant will require.

Calculation of weight:

1. If birth weight is 3.5 kg. After 1st 6 months it should be double 7 kg.
2. After that for every 3 month add the birth weight e.g. after 9 month birth weight of the baby should be $7.0 + 3.5 = 10.5$ kg.
3. Three simplified linear equations to calculate mean weight for age.

For infants < 12 months: $\text{Weight (kg)} = (\text{age in months} + 9)/2$

For children aged 1-5 years: $\text{Weight (kg)} = 2 \times (\text{age in years} + 5)$

For children aged 5-14 years: $\text{Weight (kg)} = 4 \times \text{age in years}.$

Indication of O2 in neonates

1. Central cyanosis
2. Convulsion
3. O2 saturation <90%
4. Grunting in every breath
5. Head nodding
6. Severe chest in drawing.

O2 can be given via

1. Nasal canula- usually up to 2 L/minute can be given.
2. Face mask- up to 6 L/minute can be given.
3. Head box- 6 to 10 L/minute can be given.

Problems may arise from excess O2 supply

1. ROP (retinopathy of pre-maturity)
2. BPD (broncho-pulmonary dysplasia)

Management of apnea of neonate

1. OP and NP suction (first OP then NP)
2. AMBU bag respiration @ 40/minute
3. Then check heart rate, if heart rate is absent then do CPR (Cardiac massage: AMBU=3:1)
4. Give tactile stimulation and check airway. Continue CPR for at least 5 minutes.

Criteria of a term normal newborn

Gestation	: 37 to 42 completed weeks
Birth weight	: 2500 gram to 4000 gram
Breathing	: Spontaneous, regular and rate between 30-59 per minute
Color	: Pink but slight peripheral cyanosis soon after birth is considered normal
Heart rate	: 100-160 beats per minute
Axillary temperature	: 97.7°- 99.5° F (36.5°-37.5° C)
Occipitofrontal circumference (OCP)	: 33-38 cm

A normal baby should be able to suck soon after birth. Most babies pass urine within 24 hours of birth but some may not pass urine up to 48 hours of birth. Most of the babies pass meconium within 24 hours of birth. A newborn usually sleeps around 18 hours a day.

Component of essential newborn care (ENC)

1. Clean delivery and clean cord care to prevent newborn infection.
2. Establishment of breathing.

3. Keeping the baby warm.
4. Encourage early and exclusive breast feeding.
5. Prevention of infection by following strict aseptic techniques – specially hand washing before handling the baby.
6. Start immunization schedule.
7. Correct management schedule.
8. Extra care for low Birth Weight (LBW) babies.

Management of the normal baby

A) Care at birth,

1. A clean and safe delivery in a clean environment, ideally in the presence of a skilled birth attendant and using safe delivery kit (plastic sheet, soap, boiled blade, and boiled thread)
2. A cord should be tied in three places two fingers away from the umbilicus (abdominal wall), the 2nd tie should be one finger width away from the 1st one, and the 3rd tie should be four fingers width from the 2nd one. The cord must be cut with a clean blade in between the last two cord ties and about one finger width away from the 2nd tie. If any bleeding from the cord stump is noted then another cord tie should be applied.

B) Drying and wrapping,

1. Dry the baby thoroughly after delivery and wrap with clean dry and warm cloth.
2. Check the baby's breathing and color.
3. Help to establish early breast feeding. Keep mother and baby together. Do not offer any other feed.
4. It is not necessary to bath the baby immediately after birth nor is it necessary to use oil to clean or to remove vernix from the baby's body.

C) Care following birth,

1. Exclusive breast feeding (EBF) on demand.
2. Keep the baby warm, avoid draughts at all time.
3. Do not bath the baby until 72 hours of life.
4. Keep the cord clean, dry and bare. Do not wash with spirit or other medicine. Check for urine and stool output. Baby passes meconium (black stool) in the first

24 hours. Urination should occur within first 48 hours. One breast feeding has been established, urine is expected to be voided at least 6/8 times in 24 hours.

5. Immunization - Give BCG and OPV within fourteen day of life.
6. Vitamin K-2 mg should be given orally or I/M or I/V to all newborn babies at birth. Oral dose 2 mg at 4 hours, at 4 days & at 4 weeks of life.

Neonatal resuscitation

Attending birth of a baby

- Pediatrician and obstetrician should consult amongst themselves about the baby to be delivered well in advance of the birth. Pediatrician must anticipate whether the neonate may require resuscitation or not. After delivery while newborn is cared, begin a process of evaluation, decision and action. Immediately after birth a newborn should be examined without delay to categorize his/her physical status for the need resuscitation.

Interpretation of Apgar at 1 Minute

1. Optimal (Apgar 8 to 10): Pink, crying.
2. Moderate (Apgar 5 to 7): Cyanosis, Slow irregular respiration but good tone and reflexes.
3. Severe (Apgar <4): Limp, pale or blue and apnoeic.

Decision after 1 minute

1. Apgar score >7 No further resuscitation.
2. Apgar score 5-6 Bag and mask ventilation
3. Apgar score <4 Intubation

Goal of resuscitation

- Clearing of airway
- Expansion & ventilation of the lung
- Ensuring adequate cardiac output
- Preventing heat loss.

Steps of resuscitation

A- Airway

B- Breathing

C- Circulation

D- Drugs

Indication of endotracheal intubation

1. Terminal apnoea at birth
2. Apgar 4 or less at 1 minute
3. Delayed apnea
4. Thick meconium staining
5. Extreme immaturity

Don't do

1. Slapping the baby on the back
2. Hanging him upside down by feet
3. Milking the cord
4. Routine suction of baby's mouth and nose
5. Throwing cold water on the baby's face or body.
6. Blowing into the ears or nose.
7. Bending the legs on the abdomen

Follow up of neonates

1. By SOAP (subjective, objective, assessment, plan) method
2. Follow up date and time must be noted

Subjective	Objective	Assessment	Plan
<ol style="list-style-type: none">1. New complaints if any2. Hospital stay3. Drug day (e.g. 5th day of antibiotic)4. Age	<ol style="list-style-type: none">1. General condition, skin colour, CRT, BPV, Heart rate, temperature, respiratory	<ol style="list-style-type: none">1. Improved2. Not improved3. Deteriorated	Example- antibiotic change from ceftriaxone to meropenem.

	rate, tone, bowel/bladder , lungs, reflexes, pertinent physical examination. 2. Lab data and other test results.		
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Common investigation

1. CBC with PBF
2. CRP
3. RBS-<2.2 mmol/L-hypoglycaemia, >7.6 mmol/L means hyperglycaemia. If >7.6 mmol/L then repeat after 1 hour.
4. S. bilirubin
5. S. calcium
6. Blood C/S.
7. Blood grouping & typing.
8. In case of icteric baby-Blood grouping & Rh typing of mother.
9. Chest x-ray if neonate had respiratory difficulty

PNA with HIE (Perinatal asphyxia with hypoxic ischaemic encephalopathy)

Chief complaints

1. Delayed crying after birth (after 1 minute)
2. Grunting
3. Respiratory distress
4. Convulsion (within 24 hours after delivery)

PNA with HIE stage I

Chief complaint

1. History of delayed crying

On examination

1. General condition-hyperalert/irritable
2. Pupil- dilated
3. Moro reflex-strong
4. Muscle tone-normal

Feeding- if sucking reflex present then breast feeding may allow. O2 should be given if there is cyanosis.

PNA with HIE stage II

On examination

1. Convulsion
2. Lathergic
3. Moro reflex-weak
4. Muscle tone-mild hypotonia
5. Pupil-constricted

PNA with HIE stage III

On examination

1. Convulsion may present
2. Unconscious/comatose
3. Moro reflex-absent
4. Muscle tone-flaccid
5. Spontaneous movement-diminished/absent
6. Pupil-unequal

Simplified staging

Only delayed crying-stage I

Stage I + convulsion-stage II

Stage II + lethargy/coma/shock-stage III.

Complications of PNA

1. Early- convulsion, metabolic disturbances
2. Delayed-cerebral palsy (most common), developmental delay.

Investigation for sepsis screening in PNA

If symptoms are suggestive of sepsis, usually advise after 24 hours

1. CBC (normal 5000-25000/cmm)
2. CRP (normal <12 in neonates and <6 in children)
3. RBS
4. S. calcium

Management of PNA with HIE stage I

1. Feeding – NPO TFO if no sucking reflex, baby can't feed or vomit repeatedly. Otherwise EBF may allow ideally after 24 hours.
2. O₂ inhalation 2 L/minute stat and continue
3. OP and NP suction stat and SOS
4. Keep the baby warm
5. I/V Fluid –infusion 10% DA (for day-1) or infusion APN (for D2 to 1 year)
6. Antibiotic
 - a. Inj. Ampicillin + Inj. Gentamycin OR
 - b. Inj. Ceftazidim + Inj. Amikacin OR
 - c. Inj.Cefotaxime.
7. Inj. K-one (2mg) $\frac{1}{2}$ amp I/M stat Or orally 1 amp at 4th hour, 4th day and 4th week (Rule of 4)
8. 7.1% hexicord-single application over umbilicus.
9. Use hexisol befor handling the baby
10. Monitor vitals.

Management of PNA with HIE stage II

1. As for PNA with HIE stage I
2. If convulsion

Injection phenobarbitone: loading dose-20 mg/kg/stat dose, maintenance dose-5 mg/kg should be given IV very slowly.

(Injection phenobarbitone should dilute with DW=(200 mg/1 ml) + 9 ml D/W.

Rapid calculation: Loading dose- weight in kg \times 1ml

Maintenance: $\frac{1}{8}$ th of loading dose 12 hourly)

(If weight of the baby is 3 kg then loading dose will be 3 ml and maintenance dose 0.375 ml).



Wait for 15 minutes, if not controlled repeat phenobarbitone at the dose 10 mg/kg/dose



Wait for another 15 minutes, if not controlled repeat phenobarbitone at the dose 10 mg/kg/dose



If not controlled after 15 minutes then start-inj. Phenytoin: 20 mg/kg/dose (loading dose) or inj. Phosphenytoin: 30 mg/kg/dose (loading dose) IV very slowly. Usually phosphenytoin is used.

Injection phosphenytoin 150 mg/2 CC should dilute with 3 CC DW, so after dilution 1 CC contain 30 mg phosphenytoin.

Rapid calculation: Loading dose- weight in kg \times 1ml

Maintenance: $\frac{1}{8}$ th of loading dose 12 hourly.



If convulsion still continue than give Injection diazepam 0.03-0.05 mg/kg (loading) stat then maintenance 0.03mg/kg/hour



If convulsion continue than transfer the neonate for ventilation support.

N:B: Phosphenytoin is better then phenytoin as there is no chance of phlebitis in case of phosphenytoin.

Management of PNA with HIE stage III

1. As for PNA with HIE stage I & II
2. Correction of shock if any.

Critical neonate

1. If low serum calcium then injection calcium gluconate IV slowly stat and 12 hourly for 3 days.
2. If heart rate <100 beats/minute or CRT >3 seconds-injection dopamine 0.5 ml in each 100 ml of fluid.
3. If apnoeic spell, respiratory rate <30 breaths/minute or CRT>3 seconds
 - a. Injection aminophylline $0.2 \times \text{weight} = \text{CC}$ IV stat and 12 hourly or 0.5 ml in each 100 ml fluid.
 - b. Give AMBU
 - c. If not improve consult with senior regarding adrenaline IV (0.1 ml) stat.

When we will allow breast feeding for neonates?

1. Convulsion free for 24 hours
2. Vitals are within limit
3. Sucking reflex is present.

Discharge criteria of neonate

1. Vitals are stable
2. Antibiotic 5 days doses are completed
3. Feeding established
4. Parents are motivated

Advice during discharge-after 42 days eye, ear and heart should evaluate.

How to diagnose sepsis in neonate (neonatal sepsis)

Develop within 28 days of birth. Usually come after 1-2 days of delivery.

Early onset neonatal sepsis (EONS)-if develop sepsis <72 hours after delivery.

Late onset neonatal sepsis (LONS)-if develop sepsis >72 hours after delivery.

Symptoms and signs

1. Hypothermia
2. Lethargic
3. Not feeding well/reluctant to feed
4. Fever
5. Respiratory distress
6. Convulsion (indicate meningitis, encephalitis)
7. Reddish spot over different parts of the body (indicate DIC)
8. Sclerema-hardening of skin which indicates end stage of sepsis (manage by blood transfusion).

Investigation to diagnose neonatal sepsis

1. CBC (normal 5000-25000/cmm)
2. CRP normal (<12 in neonates and <6 in children)
3. RBS
4. S. calcium

Interpretation of the investigation findings

If 2 or more of the following is positive then diagnosis is sepsis

1. WBC <4000/cmm or >25000/cmm
2. Neutrophil >75%
3. ESR >15 mm in 1st hour
4. Total platelet count <1.5 lac

Diarrhoea

History

1. Age of the child
2. Duration of the illness
3. Nature of stool
4. Blood in stool
5. Frequency and volume
6. Associated vomiting

7. Food/fluid intake
8. Drug intake history
9. History of urination-if anuria then duration
10. History of same problem in family or neighbor
11. Immunization history
12. Feeding history
13. Associated problem like fever, cough, convulsion, respiratory distress.

Clinical assessment

1. Weight
2. Assessment of dehydration
3. General condition
 - a. Skin elasticity
 - b. Thirst
 - c. Eyes

Management of no sign of dehydration

1. Diet normal
2. ORS-15 to 20 TSF after each loose motion in <2 years children; 20-40 TSF after each loose motion in >2 years old children.
3. Enterogermina-1 bottle per oral daily.
4. Syrup zinc sulphate half TSF BD if <6 months (10 mg/kg), 1 TSF BD if >6 months (20 mg/kg).

Management of some dehydration

Criteria-2 or more of the following

1. Restless/irritable
2. Sunken eyes
3. Drinks eagerly
4. Skin pinch goes back slowly (<2 seconds)

Management

1. Diet normal

2. ORS-75 ml/kg within 4 hours (if weight of the baby is 9.5 kg then $75 \times 9.5 = 712$ ml ORS should be taken within 4 hours, so 178 ml/hour, 30 ml/10 minutes. 1TSF=5 ml so 6 TSF should be taken in every 10 minutes for 4 hours.
3. Enterogermina-1 bottle per oral daily.
4. Syrup zinc sulphate half TSF BD if <6 months (10 mg/kg), 1 TSF BD if >6 months (20 mg/kg).

Management of severe dehydration

Signs

1. Lethargic/unconscious
2. Sunken eyes
3. Unable to drink/drinks poorly
4. Skin pinch goes back slowly (≥ 2 seconds)

Management

1. NPO TFO
2. Infusion cholera saline 100 ml/kg
 - a. If age <1 year then 30% fluid in 1 hour and 70% fluid within 5 hour.
 - b. If age ≥ 1 year 30% fluid in 30 minutes and 70% fluid within two and half hour.
3. After finishing fluid reassess the baby, if improve then give management to the present condition like some dehydration or no dehydration.

উপদেশ

১। জুস, চা, কফি খাওয়াবেন না।

২। বমির জন্য domperidone, ranitidine দেয়া যাবে না।

৩। পায়খানা সাধারণত ৭ দিন থাকবে।

৪। প্রতিবার পাতলা পায়খানার পর ১৫-২০ চামচ খাবার স্যালাইন খাওয়াবেন।

৫। বমি থাকলে বমি হবার কিছুক্ষণ পর অল্প অল্প করে স্যালাইন খাওয়াবেন।

৬। পায়খানা ও বমি হলে খাবার স্যালাইন, অন্য সময় পানি খেতে পারবে।

৭। এক প্যাকেট সালাইন অবশ্যই আধা লিটার পানিতে গুলাতে হবে।

Indication of antibiotic in diarrhoea

1. Severely ill baby
2. Associated infection like pneumonia, septicaemia
3. Blood in stool.

Indication of IV fluid in diarrhoea

1. Some dehydration- unable to feed, vomits after taking ORS
2. Severe dehydration
3. Inadequate urine output

Complication of diarrhoea

1. Electrolytes imbalance
2. ARF

Complications of dysentery

1. Rectal prolapse
2. HUS (haemolytic uremic syndrome)

Management of dysentery

1. Management of diarrhoea
2. Antibiotic- ciprofloxacin (20-30 mg/kg/day, 1 TSF contain 250 mg).

N:B:

1. For vomiting in diarrhoea ondasetron should be given 0.15 mg/kg/day (not recommended in <6 months age), 1 TSF=4 mg.
2. If patient has vomiting or develop vomiting after taking zinc then it should be stopped.

Treatment of hypernatraemia

This usually develops if ORS is not diluted properly (not mixed with 500 ml water). Symptoms are increasing thirst and manage with increase plain water intake and infusion 0.45% NaCl (20-30% more than total requirement in 24 hours).

Management of baby of HBs (+ve) mother

1. EBF
2. Injection Hepatitis-B immunoglobulin (100 IU/ 0.5ml)- 1amp IM stat (within 12 hours of birth-in one thigh).
3. Injection hepatitis B vaccine (0.5m μ /10 μ gm)-1 amp IM stat in another thigh, then give regular EPI vaccination.
4. Inj. K-one mm (2 mg) ½ amp IM stat
5. Keep the baby warm
6. If any other problem is present treat accordingly.

Management of infant of diabetic mother/hypoglycemia

1. Measure RBS (within 1 hour, then monitor blood glucose 6 hourly)
2. Diet- EBF
3. If infant is asymptomatic but hypoglycaemic blood glucose <2.2 mmol/L, give Infusion 10% DA 60ml/kg/day
4. If convulsion give 10% DA 2 ml/kg stat, then give fluid according to fluid requirement chart.
5. Inj. K-one mm (2mg) - ½amp IM stat
6. O₂ inhalation
7. Keep the baby warm.

Neonatal Jaundice

Neonatal jaundice is a common problem. Normally every child develop jaundice on second day and disappear on day 10 –it is called physiological jaundice, but in some pathological condition jaundice appear on first day and persist more than 14 days.

Investigation

1. S. bilirubin –total, direct, indirect
2. Blood grouping and Rh typing
3. In suspected case of haemolytic disease of the new born-Coomb test, reticulocyte count, CBC with PBF.

Management

1. In case of pathological jaundice need phototherapy accordingly to jaundice management chart.
2. If not improving and bilirubin level is increasing gradually then need- exchange transfusion.

N.B.-Phototherapy is indicated when indirect s. bilirubin level is high. In case of raised direct S.bilirubin phototherapy is contraindicated.

Treatment of cerebral malaria

1. Quinine-loading dose: 20 mg/kg/dose in 100ml 10% baby saline @ 25 micro drops/minute over 4 hours. Maintenance dose- after 8 hours of loading-10mg/kg/dose in 100ml 10% baby saline @ 25 micro drops/minute over 4hours – TDS – up to regain of conscious and the patient's can take oral medication.
2. Oral quinine- 10 mg/kg/dose – TDS, total duration 7 days.

Most popular antimalarial regimens -Arthemether + lumefantrine

Child: Artemether + lumefantine

2 tablet stat then 2 tab. after 8 hour in day 1

Then Artemether + lumefantine

2+0+2---- for 2 days

AGN

Diagnostic tools

1. Swelling of whole body, starting from face
2. Reduce urine output
3. History of sore throat or skin lesion 1-3 weeks before.
4. On examination-edematous, facial puffiness, blood pressure-increased
5. Bed side heat coagulation test-positive.
6. Investigation- urine R/E-haematuria, proteinuria. Other investigations- CBC with PBF, S. C₃ level, S. electrolytes, S. creatinine, USG of W/A

Management

1. Bed rest
2. Diet – protein, fruit, salt restriction.
3. Fluid- previous day output + Insensible loss ($400 \text{ ml/m}^2 \times \text{BSA}$)
4. Frusemide-1 mg/kg/dose
5. Oral phenoxymethyl penicillin(50 mg/kg/day in 4 divided doses)– for 10 days.
6. Antihypertensives if need (nifedipine, enalapril, captopril)
7. Please maintain input-output chart.

Nephrotic syndrome

Diagnostic tools

1. Swelling of whole body, starting from face
2. Reduce urine output
3. On examination-edematous, facial puffiness, blood pressure-normal.
4. Bed side heat coagulation test-positive (+++ proteinuria).
5. Investigation- urine R/E-proteinuria. Other investigations- CBC with PBF, S. creatinine, 24 hours UTP, S. cholesterol, S. albumin, S. globulin, spot urinary protein creatinine ratio(confirmatory diagnosis if it is >2).

Management

1. Diet- normal diet along with protein rich diet
2. Salt restriction
3. Fluid restriction: Previous day output + $400 \text{ ml} \times \text{BSA}$
4. If UTI then give antibiotic
5. If UTI absent start it's specific treatment prednisolone.
6. If upper GI discomfort add ranitidine
7. Calcium supplementation if more than 3 months of steroid therapy.

Dose of prednisolone

1st attack- prednisolone $60 \text{ mg/m}^2/\text{day}$ in single morning dose for 6 weeks, followed by $40 \text{ mg/m}^2/\text{day}$ as single morning dose on alternate day for another 6weeks then slowly tapered and discontinued over the next 4-8 weeks.

Relapse case- prednisolone (in single dose) 60 mg/m²/day till urine free from albumin for 3 consecutive day followed by 40 mg/m²/day on alternate day for another 6 weeks. The alternate day dose then slowly tapered and discontinued over the next 4-8 weeks.

Importance of BSA [BSA = wt in kg \times 4 + 7/(wt in kg + 90) m²]

In NS: to calculate the dose of steroid

In AGN: To calculate the amount of water

Nephrotic range of protein: 0.1gm/m²/ 24 hours or 40 mg/m²/hour

N:B:

1. Remission-protein free urine for 3 consecutive day(<4 mg/m²/hr)
2. Relapse-proteinuria for 3 consecutive days, having previously remission.
3. Infrequent relapse- 3 or less relapses within 1 year.
4. Frequent relapse- 2 or more relapse within 6 months or more than 3 relapses within any 12 months period.
5. Steroid dependent- relapse during whole or alternative day steroid therapy or within 28 days of stopping steroid therapy.
6. Steroid resistance- fail to respond within 8 weeks.

Heat coagulation test

Principle

When protein is heated in acidic medium, it becomes denatured because of the breaking of certain bonds, and when this protein is heated at their isoelectric pH, polypeptide chain becomes uncoiled and become melted together to form insoluble masses which is known as coagulum.

Procedure

1. Fill 2/3rd of the test tube with urine.
2. Add few drops of 2% acetic acid in it.
3. Heat the upper portion of the test tube up to boiling.

Observation

The thick white coagulum is formed at the upper part of the test tube.

Interference

Albumin and globulin is present.

Test against a written paper

1. If writing can be seen but not clear but can read : +
2. If writing can be seen but not read : ++
3. If writing can't be seen : +++
4. If curd like sedimentation : ++++

Pneumonia

Chief complaints

1. Fever
2. Cough
3. Fast breathing
4. Chest indrawing

On examination

1. Patient is febrile
2. Respiratory rate increase
 - a) 0-2 months ≥ 60 breaths/minute
 - b) 2 months-1 year ≥ 50 breaths/minute
 - c) >1 year ≥ 40 breaths/minute

Features of severe pneumonia

1. Severe chest indrawing (deep easily visible)
2. Stridor in calm child
3. Any general danger sign

Investigation in pneumonia patient

1. CBC with PBF
2. Chest X-ray

3. Others if needed

Management of severe pneumonia

1. Diet – normal (if feeding is not possible then give IV fluid for short duration)
2. Clear air way OP-NP suction
3. O₂ inhalation (SPO₂ <90%) 1-2 L/minute
4. Nebulization with NS 1.5 CC + Salbutamol solution 0.5 cc + Ipratropium bromide solution 0.5 cc stat. and 20 minutes interval for 2 hour then 2 hourly.
5. Antibiotic
 - a. Inj. amoxicillin 100 mg/kg/day TDS
 - b. If the child improve switch to oral amoxicillin 50 mg/kg/day TDS, total duration 7-10 days
 - c. If no response by 48 hours then inj. ceftriaxone (80-100 mg/kg/day – 7days
6. Syp. Paracetamol (if fever)
7. Follow up every 2 hourly

Signs of improvement of pneumonia patient-3F

1. Fast breathing (reduce respiratory rate)
2. Fever (reduce than before)
3. Feeding (improvement of feeding).

Bronchiolitis (হাসি, কাশি, মুখে বাঁশি)

This is the common respiratory problem of children (usually <2 years, peak in 2-6 months) and frequently admitted in child ward.

Common presentation

1. Fever
2. Cough
3. The child is usually playful

Investigation

1. Diagnosis is clinical but to exclude other differentials CXR may be done.

Management

1. Diet: breast feeding and other accordingly age. If distress is severe than IV fluid may be given.
2. Humidified O₂ therapy 1-2 L/minute SOS
3. Nebulization with salbutamol solution 4 hourly (can be given more frequently).
4. Syrup paracetamol (if fever)
5. If nasal discharge then norsol nasal drop 1 drop in both nostril 4 hourly
6. Keep the baby warm
7. Monitor vital signs.

Advice of bronchiolitis patient's parents during discharge

বাচ্চার শ্বাস-কষ্ট, শ্বাসের গতি বেড়ে গেলে, বাচ্চা খেতে না চাইলে, বাচ্চা নেতিয়ে পড়লে দ্রুত চিকিৎসকের পরামর্শ নেবেন/শিশু বহিবিভাগে দেখা করবেন।

Management of status asthmaticus

Common presentation

1. Usually a diagnosed case of asthma, present with increasing breathlessness, cough.
2. Fever may be present (as a precipitant of attack).
3. Chest examination-bilateral polyphonic ronchi. May be clear (silent chest).
4. Urgent chest X-ray should be done to exclude any other lung problem (but treatment must be started before doing X-ray).

Management

1. Propped up position
2. O₂ inhalation 1-2 L/minute
3. Injectable antibiotic (amoxicillin/ceftriaxone)
4. Nebulization with salbutamol stat and 20 minutes interval for 1-2 hour then 2 hourly.
5. Injection hydrocortisone 3-4 mg/kg/dose IV 6 hourly or oral tablet/syrup prednisolone 2 mg/kg/day for 3-5 days.
6. If still no improvement nebulization with adrenaline, Mgso₄.
7. If refractory case referred to ICU for ventilator support.

Meningitis/Encephalitis

Diagnostic tools

1. Patients present with fever, alteration of consciousness, convulsion etc. There may be history of focal infection like mastitis, tonsillitis, ear discharge.
2. On examination-neck rigidity, Kernig's sign present (in <2 years those sign not found due to incomplete myelination of the nerves)
3. Investigation- CBC with ESR, serum electrolytes, urine R/M/E, CSF study & C/S, blood C/S.

Management

1. NPO TFO
2. OP-NP suction SOS
3. O2 inhalation 2 L/minute
4. Infusion (accordingly body weight and age)
5. Injection ceftriaxone (100 mg/kg/day) (1 gram ceftriaxone +10 cc DW, after dilution IV injection of equal cc of baby's weight; e.g. if baby is 5 kg then IV 5cc stat and daily).
6. Injection dexamethasone (5 mg/1ml) – $\text{weight} \times 0.08$ cc IV 6 hourly for 2 days. (dexamethasone should be given 15 minutes before antibiotic).
7. Injection phenobarbitone (1cc + 10 cc DW)-loading dose IV equal cc of baby's weight; maintenance dose $\text{weight}/8$ cc IV BD.
8. Injection ranitidine- $0.1 \times \text{weight} = \text{cc}$ IV 8 hourly
9. If convulsion present manage accordingly.
10. Supp. Paracetamol (15 mg/kg/dose)
11. Monitoring the vital signs
12. Maintain temperature chart
13. If Herpes simplex is suspected then acyclovir 10 mg/kg/dose IV 6 hourly then 20 mg/kg/dose orally 5 times/day for 10 days.

Febrile convulsion

1. Occurs between 6 months to 6 years of age.
2. Male predominant
3. Seizure is mostly generalized
4. Usually one episode within 24 hours

5. Usually one episode persists for <15 minutes
6. Absence of CNS or metabolic disorder (bulging fontanelle, neck stiffness, stupor, irritability)
7. No post ictal phase
8. No residual neuro deficit.
9. May have family history.
10. Convulsion occurs during rapid rise of temperature.

Management

1. ABC- 'A' airway, 'B' breathing, 'C' circulation
2. Control of seizure- injection diazepam P/R 0.5 mg/kg/dose, IV 0.2 -0.3 mg/kg/dose. (for P/R diazepam the amount should be 5 cc, at least 3 cc, rapid calculation- take diazepam 0.× baby's weight e.g. if baby's weight is 3 kg then 0.3 cc then dilute with 3 cc DW).
3. If signs of infection is present, use appropriate antibiotics.
4. Supp. Paracetamol (15mg/kg/dose)
5. Intermittent prophylaxis- tablet diazepam 0.5mg- 1mg/kg/day 3 divided doses, not more than 10mg/day along with paracetamol to start at the onset of fever and continued during the period of febrile illness usually for 72 hours up to 5 years.

Counseling to parents

- ১। আবার এমন খিচুনি হতে পারে।
- ২। জ্বর আসার সাথে সাথে ঔষধ খাওয়াতে হবে।
- ৩। বাসায় ডায়াজিপাম ইঞ্জেকশন পায়খানার রাস্তায় ব্যবহার করার জিনিস রাখাবেন, বয়স বাড়ার সাথে সাথে ডোজ পরিবর্তন করে নেবেন।
- ৪। ফ্রিজে ডায়াজিপাম সাপোজিটরি রাখাবেন।
- ৫। জ্বর আসলে খিচুনি হোক বা না হোক কমপক্ষে ৩ দিন ডায়াজিপাম ও প্যারাসিটামল খাওয়াবেন।
- ৬। ভবিষ্যতে ১% এর মৃগী রোগ হতে পারে।
- ৭। বাচ্চার বুদ্ধির কোন সমস্যা হবে না।

Food poisoning

Diagnostic tools

1. Intake of unhygienic food, drink
2. Abdominal pain
3. Vomiting
4. Loose motion
5. Family members may be affected
6. Fever may be present

Management

6. NPO TFO (if repeated vomiting)
7. Infusion cholera saline (100 ml/kg to correct dehydration)
8. Injection ceftriaxone
9. Inj. timonium methylsulphate
10. Paracetamol if fever
11. ORS -10 to 15 TSF after each loose motion.

Kerosene poisoning

Stomach wash is contraindicated.

Management

1. NPO TFO
2. O₂ inhalation stat and SOS (if respiratory distress present)
3. Maintenance of nutrition by IV fluid (according to weight and age)
4. Antibiotic
5. Treatment of complications

Management of shock

Assessment

1. In less than 3 years-BPV, CRT
2. In more than 3 years-BPV, BP

	Infant and children	Neonates
1. Normal saline	20 ml/kg	10 ml/kg
Assessment after 20 minutes, if not recovered		
2. Normal saline	20 ml/kg	10 ml/kg
If not recovered after 20 minutes then asses cold periphery or warm periphery		
Cold periphery	Warm periphery	
<p>Injection dopamine 0.2-0.7 cc/kg in total fluid, then infuse 100 ml then reassess, if not recovered increase dose of dopamine.</p> <p>If shock not recover with dopamine then switch to dobutamine and then noradrenaline.</p>	<p>Suspect septic shock</p> <p>Arrange blood transfusion.</p>	

Management of anuria

