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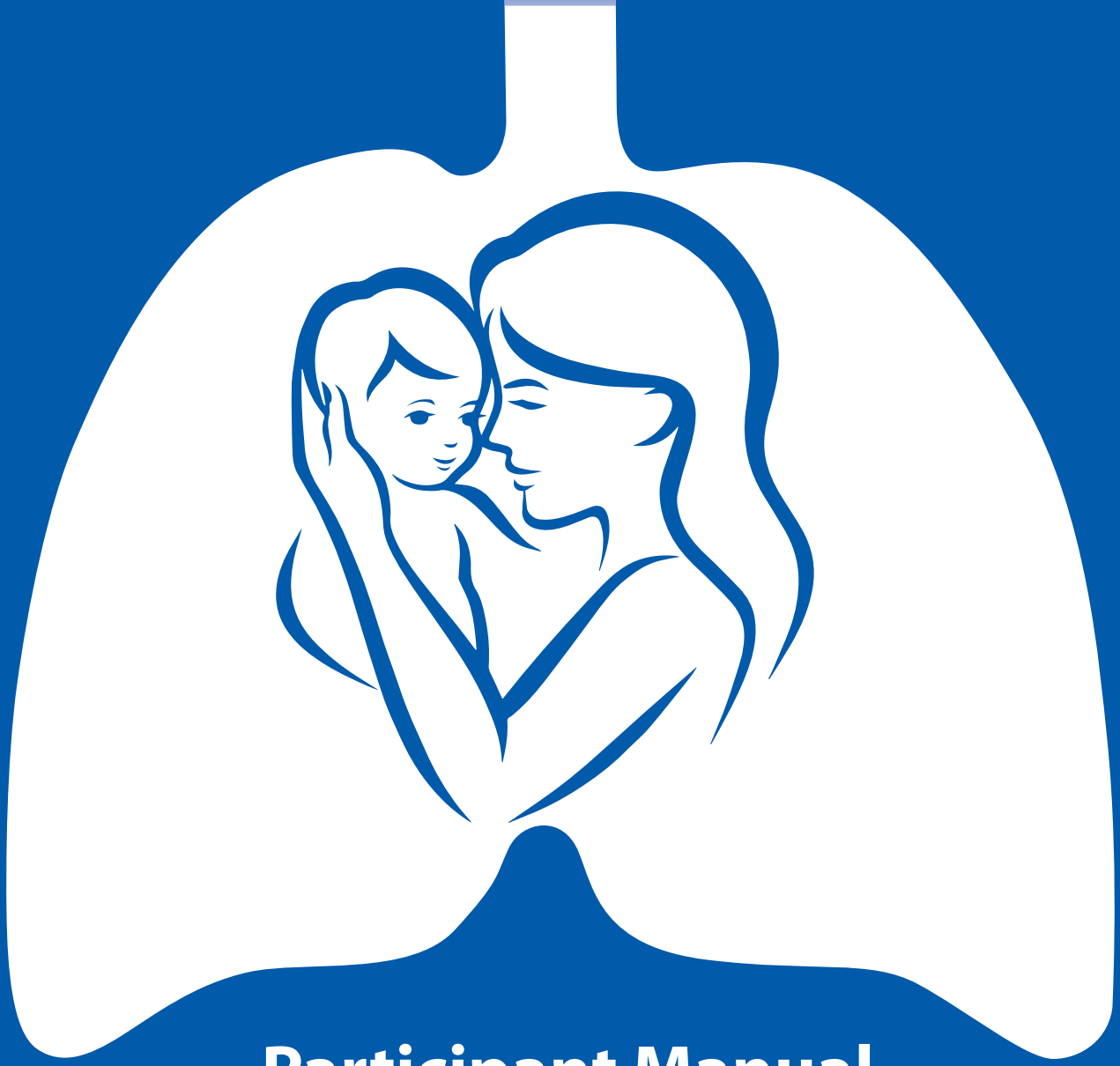
NATIONAL HEALTH MISSION
राष्ट्रीय स्वास्थ्य मिशन



Participant Manual

Pneumonia Management

For Medical Officers & Staff Nurses

Ministry of Health & Family Welfare,
Government of India, New Delhi

April 2020

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Table of Contents

List of Abbreviations

ANM	Auxiliary Nurse Midwife
ARI	Acute Respiratory Infection
ASHA	Accredited Social Health Activist
ALRI	Acute Lower Respiratory tract Infection
CHO	Community Health Officer
DPT	Diphtheria, Tetanus, and Pertussis
EBF	Exclusive Breast Feeding
EIBF	Early Initiation of Breast Feeding
GAPPD	Global Action Plan for the Prevention & Control of Pneumonia and Diarrhea
HIV	Human Immunodeficiency Virus
HWC	Health and Wellness Center
IAPPD	India Action Plan for the Prevention & Control of Pneumonia and Diarrhea
IPC	Inter Personal Communication
IM	Intramuscular
IMNCI	Integrated Management of Neonatal & Childhood Illness
IV	Intra Venous
IYCF	Infant and Young Child Feeding
JSSK	Janani Shishu Surakshaa Karyakaram
KMC	Kangaroo Mother Care
MO	Medical Officer
MDI	Metered Dose Inhaler
WASH	Water, Sanitation and Hygiene

Section 1: Introduction

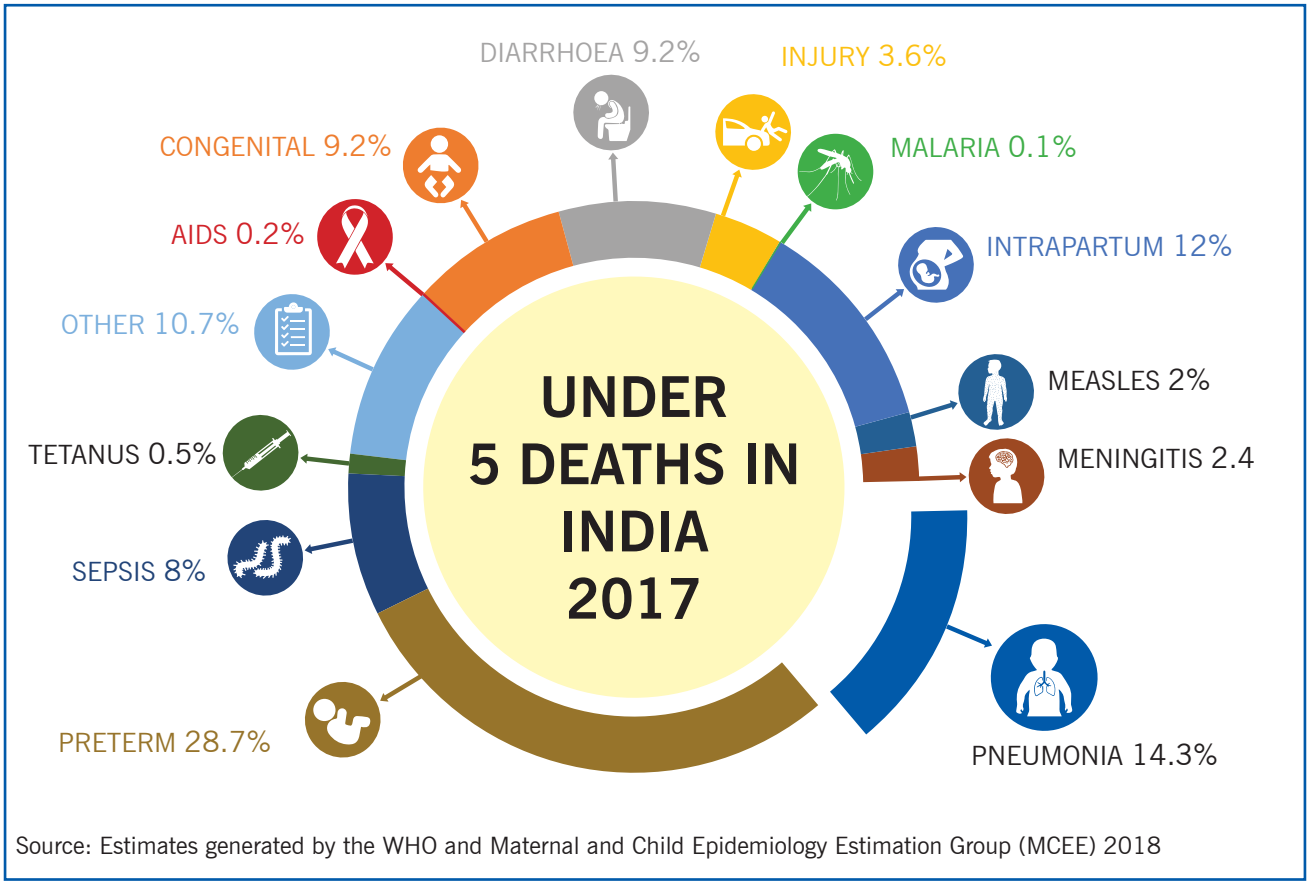
Childhood Pneumonia continues to be the topmost infectious killer among under-five children, contributing to 14.3 percent of under five deaths in the country. Around 1.27 lakhs children die due to Pneumonia annually in the country. Mortality due to pneumonia is strongly linked to malnutrition, poverty and inadequate access to health care.

Pneumonia morbidity & mortality in India	
Number of episodes of ARI/Pneumonia every year[1]	30 Million
Incidence Rate (per child per year)[2]	0.22
Severe cases out of total cases	3 Million (10%)
Mortality Rate per 1000 live births[3]	5.7

The national goals for pneumonia to be achieved by 2025, under the Integrated India Action Plan for Pneumonia and Diarrhoea (IAPPD) are:

- Reduce mortality from pneumonia to < 3 per 1000 live births;
- Reduce the incidence of severe pneumonia by 75% as compared to 2010 levels

Figure 1- Causes of Under 5 Deaths in India, 2017



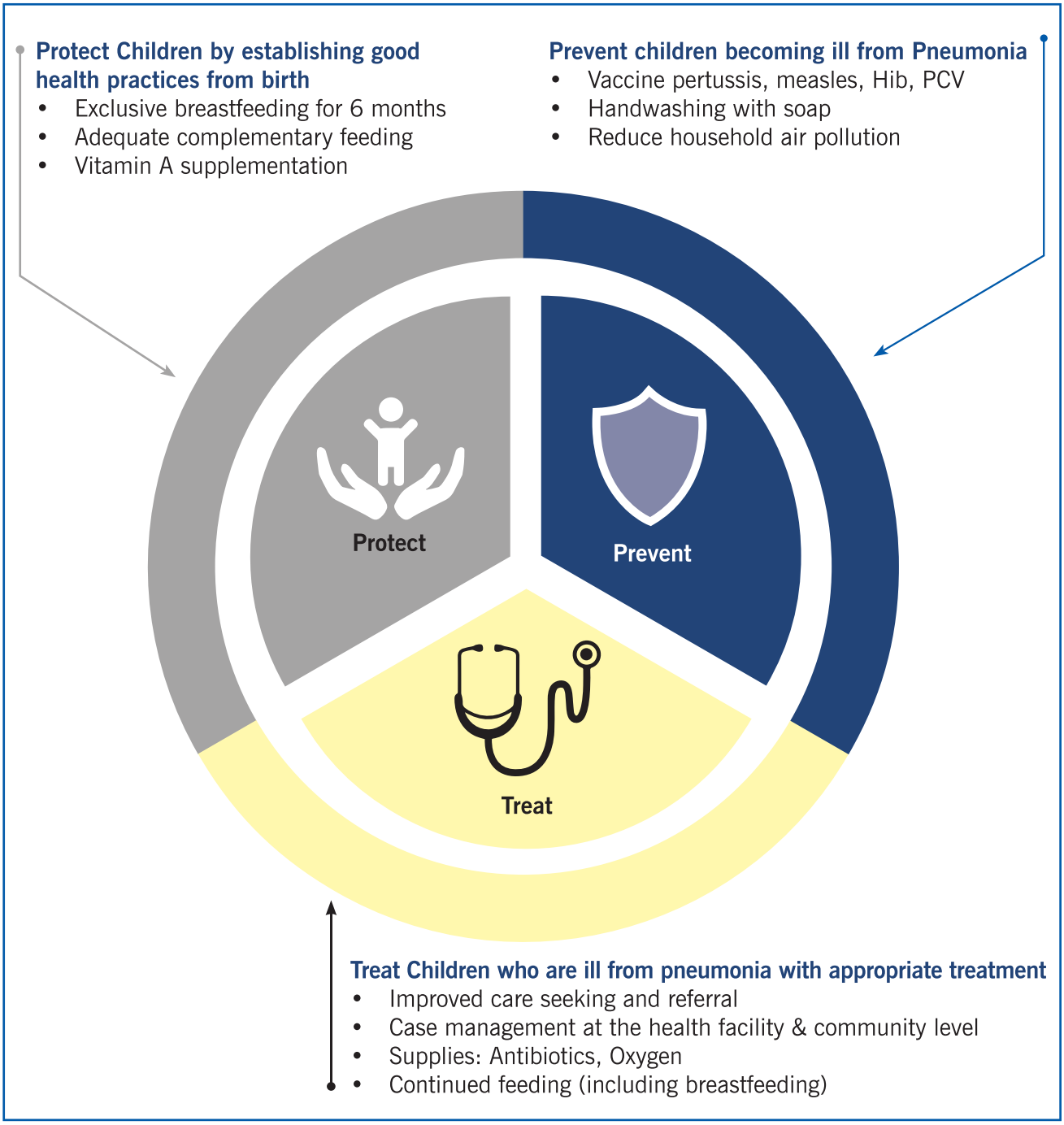
Source: Estimates generated by the WHO and Maternal and Child Epidemiology Estimation Group (MCEE) 2018

1. Lancet Volume 17, November 2017, Estimates of the global, regional and national morbidity, mortality and etiologies of lower respiratory tract infections in 195 countries : A systematic analysis for Global burden of disease study 2015
2. Pneumonia estimates based on census 2011 and Pneumonia morbidity data from Lancet Volume 17, November 2017
3. Estimates based on Census 2011 population, SRS 2017 and Pneumonia Mortality data from Lancet Volume 17, November 2017

1.1- Protect, Prevent and Treat framework

The protect, prevent and treat framework provides key interventions to comprehensively address the pneumonia problem. Deaths due to pneumonia are largely preventable if protect, prevent & treat interventions (PPT) are adequately and appropriately implemented. The Protect, Prevent and Treatment Framework for Pneumonia management is as follows:

Figure 2- Framework of Childhood Pneumonia adapted from GAPPD / IAPPD



Protect

Protecting children by establishing and promoting good health practices;

- Exclusive breastfeeding for six months and continued breastfeeding with appropriate complementary feeding reduces the onset and severity of pneumonia
- High-dose vitamin A supplementation helps maintain strong immune systems and can reduce all-cause mortality

Prevent

Preventing children from becoming ill from pneumonia by ensuring universal coverage of immunization, and healthy environments;

- Use of vaccines like Measles/MMR, Pentavalent vaccine, Pneumococcal vaccine substantially reduces the disease burden and deaths caused by the infectious agents.
- Hand-washing and promotion of key hygiene practices provide health, economic and social benefits.
- Reduction of household air pollution has been shown to reduce pneumonia incidence. According to WHO 45% of pneumonia deaths in children are attributable to household air pollution

Treat

Treating children who are ill from pneumonia with appropriate treatment;

- Identification and treatment of pneumonia in the community, at first-level health facilities and at referral hospitals using standardized guidelines, substantially reduces child deaths.

1.2 -Overview of the training module

This training module provides guidance on assessment, classification and management of children with pneumonia age up to 5 years. Further, this module is divided in two age groups.

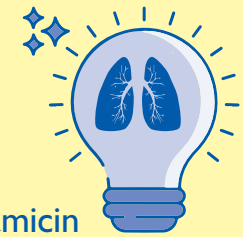
- Management of young infants age up to 2 months (0 to 59 days old)
- Management of sick children 2 months up to 5 years (2 to 59 months)

The module aligns with the IMNCI approach of assess, classify and treat using three colours (pink, yellow and green):

- Conditions with pink colour indicate severe illness. Children with a severe illness must be referred to a hospital or sent to the doctor.
- Conditions with yellow colour should be treated with medicine at home and home care advice to the mother.
- Conditions with green colour are to be treated with home care without the use of medicines.

Section 2: Pneumonia assessment, classification and management protocol for children

After the session, the participants "Must Know":



- Classification of pneumonia
- Identification of danger signs for pneumonia
- Community management of pneumonia
- Dose and duration for treatment with Amoxicillin and Gentamicin
- Facility management of pneumonia
- When and where to refer a child with Severe Pneumonia/ Very Severe Disease

What is Pneumonia?

- Pneumonia is inflammation of lungs, in which the air sacs (alveoli) get filled with pus & may become solid. Pneumonia is inter-changeably used as acute lower respiratory tract infection (ALRI) or acute respiratory infections (ARI).
- Pneumonia is frequently caused due to infection which may be bacterial, viral, fungal, or parasitic. The most common bacteria causing pneumonia are *Streptococcus pneumoniae and Haemophilus influenzae*. Children with bacterial pneumonia may die from hypoxia (too little oxygen) or sepsis (generalized infection).
- Symptoms may include fever, cough, and difficulty in breathing.

Two important clinical signs for assessing pneumonia:

- Fast breathing
- Chest indrawing

2.1- Outpatient case management of Pneumonia in children (2-59 months)

- Greet and ask the mother what the child's problems are
- Determine if this is initial visit or a follow up visit for this problem
- Check for general danger signs: A child with any general danger sign needs URGENT attention; complete the assessment and any pre-referral treatment immediately so referral is not delayed.

The general danger signs are:

- Not able to drink or breastfeed
- Vomits everything
- Convulsions
- Lethargic or unconscious

ASK: Is the child **able to drink or breastfeed?**

- A child has the sign “not able to drink or breastfeed” if the child is not able to suck or swallow when offered a drink or breastmilk.
- If the mother says that the child is not able to drink or breastfeed, ask her to describe what happens when she offers the child something to drink. If you are not sure about the mother’s answer, ask her to offer the child a drink of clean water or breastmilk. Look to see if the child is swallowing the water or breastmilk.
- A child who is breastfed may have difficulty sucking when his nose is blocked. If the child’s nose is blocked, clear it. If the child can breastfeed after his nose is cleared, the child does not have the danger sign, “not able to drink or breastfeed.”

ASK: Does the **child vomit everything?**

- A child who is not able to hold anything down at all has the sign “vomits everything.” A child who vomits several times but can hold down some fluids does not have this general danger sign.

ASK: Has the **child had convulsions?**

- Ask the mother questions on whether the child has suffered from convulsions (local term) or not.

LOOK: See if the child is **lethargic or unconscious.**

- The lethargic child is sleepy when the child should be awake. A child who stares blankly and does not appear to notice what is happening around is also lethargic.
- The unconscious child does not waken at all. This child does not respond to touch, loud noise or pain.

Remember

- All sick children must be assessed for general danger signs
- A child who has even one general danger signs has a severe problem. Refer this child urgently to hospital
- Complete the rest of assessment and any pre-referral treatment immediately so that referral is not delayed

2.1.1- Assess cough or difficult breathing

ASK: The mother/caregiver if the **child has cough or difficult breathing.**

- If the child has no cough or difficult breathing, do not assess for the same. If the mother/caregiver says that the child has cough or difficult breathing, then:

ASK: **For how long?**

- A child who has had cough for more than 14 days needs to be referred to hospital for further assessment

LOOK and LISTEN for STRIDOR:

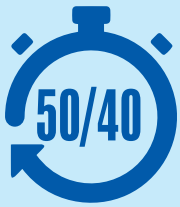
- ***Stridor*** is a harsh noise made when the child breathes IN. Stridor happens when there is a swelling of the larynx, trachea or epiglottis. To look and listen for stridor, look to see when the child breathes IN. Then listen for stridor by putting your ear near the child's mouth because stridor can be difficult to hear. Sometimes you will hear a wet noise if the child's nose is blocked. Clear the nose, and listen again. A child who is not very ill may have stridor only when he/she is crying or upset. Be sure to look and listen for stridor when the child is calm

LOOK: **Count the breathing rate**

- Counting of breaths in a child helps us ascertain whether the child has normal or fast breathing
- The child must be quiet and calm. If the child is frightened, crying or angry, you will not be able to obtain an accurate count
- To count the number of breaths in one minute:
  - Use a watch with a second hand or a digital watch
  - Put the watch where you can see the second hand and the breathing movements
  - Glance at the second hand as you count the breaths the child takes in one minute
  - Look for breathing movement anywhere on the chest or abdomen. Usually you can see breathing movements even on an child who is dressed. If you cannot see this movement easily, ask the mother to lift the child's shirt
  - If you are not sure about the number of breaths you counted, repeat the count

Child has fast breathing if you count:

- 50 breaths per minute or more in a child 2 months upto 12 months
- 40 breaths per minute or more in a child 12 months up to 5 years



Note: For a child who is exactly 12 months old, count of 40 breathes per minute or more will be considered as fast breathing

LOOK: **For chest indrawing**

- If you did not lift the child's shirt when you counted the breaths, ask the mother to lift it now.
- Look for chest indrawing when the child breathes IN.
- Look at the lower chest wall (lower ribs).
- In normal breathing, the whole chest wall (upper and lower) and the abdomen move OUT when the child breathes IN.
- When chest indrawing is present, the lower chest wall goes IN when the child breathes IN.
- For chest indrawing to be present, it must be clearly visible and present all the time. If you only see chest indrawing when the child is crying or feeding, the child does not have chest indrawing.

Picture 1: Child with chest indrawing

- Chest indrawing in a child with cough or difficult breathing indicates that the child has pneumonia.

2.1.2- Classify cough or difficult breathing

Classify children with cough and/or difficult breathing using the classification given below:

- Measure oxygen saturation using pulse oximeter (refer to annexure 3)
- Listen for wheeze. Wheezing is a high-pitched whistling sound made while child breathes. It is heard most clearly when sick children exhale, but in severe cases, it can be heard when they inhale. It is caused by narrowed airways or inflammation in the airways

Sign	Classify as	Management
• Any General danger sign Or • Stridor in calm child	SEVERE PNEUMONIA OR VERY SEVERE DISEASE	• Hospitalize • Give oxygen if saturation < 90% • Manage airway • Give recommended antibiotics
• Chest indrawing Or • Fast breathing (2 months up to 12 months-50 breaths per minute or more) (12 months up to 5 years- 40 breaths per minute or more)	PNEUMONIA	• Give oral Amoxicillin for 5 days • Treat wheeze if present* • Advice home care for cough & cold • Advise mother when to return immediately • Follow up after 2 days
• No signs of pneumonia or very severe disease	NO PNEUMONIA: COUGH OR COLD	• Advice home care for cough & cold • If coughing for more than 14 days, refer for assessment • Follow up after 5 days if not improving
* If the child has wheezing, give 3 doses of nebulized salbutamol for 20 minutes; or 2-4 puffs of salbutamol MDI with spacer (at a gap of 2-3 minutes between each puff) repeated every 20 minutes and reassess (refer to annexure 2)		

- Child with any general danger sign or having Stridor when calm would be classified as Severe Pneumonia or Very Severe Disease
- If the child has no classification in pink box, then look for Chest indrawing and/or fast breathing. Child with chest indrawing or fast breathing would be classified as Pneumonia
- Child with No signs of Pneumonia or Very Severe Disease would be classified as No Pneumonia: Cough or cold
- Refer the children with classification of Severe Pneumonia/Very Severe Disease for hospitalization to the appropriate health facility after administering pre-referral dose of Oral Amoxicillin and Injection Gentamicin. If oral medication is not possible give Injection Ampicillin and Gentamicin. If oxygen saturation is less than 90%, administer oxygen to the child while arranging referral
- Administer Oral Amoxicillin for 5 days and counsel on home care to children with classification of Pneumonia. Follow up after 2 days. If condition of child is improving, complete 5 days treatment. If after 2 days child's condition worsens or no improvement, refer for hospitalization
- If the child has wheezing, give 3 doses of nebulized salbutamol for 20 minutes; or 2-4 puffs of salbutamol MDI with spacer (at a gap of 2-3 minutes between each puff) repeated every 20 minutes. Reassess the child and then classify the problem. Antibiotics should not be used if there is significant improvement with bronchodilator. Once the child has improved sufficiently to be discharged home, then oral Salbutamol (in syrup or tablets) can be given. Sometimes pneumonia can also have some element of wheezing and in such cases there is usually persistence of tachypnoea and/or respiratory distress even after bronchodilator use, and or patient may be sick or toxic looking. In such overlapping situations antibiotics may be continued with bronchodialtors
- If referral for hospitalization is not feasible or refused, manage with oral amoxicillin twice a day and injection gentamicin once a day for 7 days with daily monitoring
- Counsel on home care for children classified as 'No Pneumonia: cough or cold'

2.1.3- Treatment of Pneumonia

Give Pre-referral IM Ampicillin/Oral Amoxicillin and IM Gentamicin for Severe Pneumonia or Very Severe Disease

Table 1: Pre-referral dosage of antibiotics for Severe Pneumonia or Very Severe Disease*

WEIGHT	Amount of Gentamicin to be given intramuscularly as Injection (vial - contains 80 mg in 2 ml)	Amount of Ampicillin to be given intramuscularly as Injection(Vial of 500 mg mixed with 2.1 ml sterile water to give 500 mg/2.5 ml)	Amount of Amoxicillin to be given per-orally as Syrup (contains 125 mg/ 5 ml)	Amount of Amoxicillin to be given per-orally as tablet (contains 250 mg)
2 months up to 4 month- <6 kg.)	0.5-1.0 ml	1ml	5 ml	½
4 months up to 12 months (6- <10 kg.)	1.1-1.8 ml	2ml	10 ml	1
12 months up to 3 years (10- <14 kg.)	1.9-2.7 ml	3ml	15 ml	1½
3 years up to 5 years (14- <20 kg.)	2.8-3.5 ml	5ml	-	2

*Give Injection Gentamicin once a day and Oral Amoxicillin twice a day for 7 days if referral is refused/ not possible. If oral medication not possible, give Injection Gentamicin once a day and Injection Ampicillin 4 times a day

Treatment of Pneumonia with Amoxicillin

Give Amoxicillin by mouth every morning and every night for five days. The dose of Amoxicillin according to age is summarized in table 2:

Table 2: Dosage of Amoxicillin for Pneumonia

AGE or WEIGHT	Amount of Amoxicillin to be given orally as syrup (125 mg per 5 ml) twice a day x 5 days	Amount of Amoxicillin to be given orally as a dispersible tablet (250 mg) twice a day x 5 days
2 months up to 4 months (4 to < 6 kg)	5 ml	½
4 months up to 12 months (6 kg to < 10 kg)	10 ml	1
12 months up to 3 years (10 kg to <14 kg)	15 ml	1½
3 years up to 5 years (14 kg to <20 kg)	-	2

Remember

- A child with any danger sign or Stridor when calm has **Severe Pneumonia or Very Severe Disease** and needs urgent referral to hospital.
- A child who has no general danger sign and no stridor when calm but has chest indrawing and/or fast breathing has **Pneumonia**. This child should be treated with medicine at home.
- A child who has none of the above signs has **No Pneumonia: Cough or Cold.** The mother of this child should be advised how to give home care.

2.1.4- Home Care for child with cough and cold

Children classified as **Pneumonia or No Pneumonia**: Cough and Cold, the health worker will advise on the following home care messages:

- Advise to properly clothed the child and keep the child warm
- Breast-feeding should be continued
- Advise to give home available fluids as much as the child would take. This would help in the relief of cough
- Give the child a safe homemade soothing cough remedy if the child is (more than 6 months of age) like Honey, tulsi, ginger, herbal concoctions and other safe local home remedies. Avoid cough syrups. **An infant below 6 months who is exclusively breast fed should not be given any home remedy**
- Keep the nose clean by putting in nasal drops (boiled and cooled water with salt mixed in it) and by cleaning the nose with a soft cotton cloth. Family can also prepare saline nasal drops at home by adding ½ teaspoon of common salt (2.5 gm) to 250 ml (1 glass) of clean drinking water. Fresh solution should be prepared daily
- The family should also be advised on how to give drugs at home
- Look for signs of illness when to return:

Look for signs of illness, when to return:

- ✓ Child becomes sicker,
- ✓ Not able to drink or breastfeed,
- ✓ Fast breathing,
- ✓ Difficult breathing, or
- ✓ Child develops fever

- If any of these signs appear, then the mother/caregiver should contact the ASHA / ANM / Doctor immediately
- Use Mother and Child Protection Card to counsel the family on signs and prevention from pneumonia in children (refer to annexure 5)

2.2 - Facility based management (In-patient) of Severe Pneumonia in children 2 months-59 months of age

Severe Pneumonia is defined as cough or difficult breathing in a child with at least one of the following conditions:

- Central cyanosis or Oxygen saturation < 90%
- Severe respiratory distress (Laboured of very fast breathing {Respiratory Rate >70 per minute} or severe lower chest indrawing or head nodding or stridor or grunting)
- Signs of Pneumonia with general danger sign-not able to drink or breastfeed, vomits everything, convulsions, lethargy or reduced level of consciousness

Such children are very hypoxic and need urgent treatment and oxygen therapy. They often cannot take medication orally and therefore need to be given intravenous fluids and parenteral antibiotics. These children need a very close monitoring for distress and oxygen saturation as they are at higher risk of complications.

On auscultation, you may get following signs in severe pneumonia:

- Bronchial breath sounds
- Crackles
- Decreased breath sound
- Abnormal vocal resonance (decreased over a pleural effusion or empyema, increased over lobar consolidation)

2.2.1- Investigations

- Obtain a chest X-ray in all children with severe pneumonia to identify complications and decide treatment
- Hemogram (Hb, TLC, DLC)
- Blood culture may be sent, where possible, in severely ill septicameic children or with severe complicated pneumonia

Note: If the child also has wheezing, a trial of inhaled salbutamol should be given in addition, and if there is improvement it should be continued under monitoring. In severe pneumonia do not delay antibiotics administration, pending evaluation of response to bronchodilators, unlike cases with pneumonia.

2.2.2- Antibiotic Therapy

- Injection Ampicillin 50 mg/kg or Benzyl penicillin 50 000 U/kg IM or IV every 6 hours. Gentamicin 7.5 mg/kg IM or IV once a day
- Give Cloxacillin or Amoxicillin + Clavulanic acid if Staphylococcal infection is suspected (presence of skin pustules / boil)
- If the child does not show signs of improvement within 48 hours, switch to Gentamicin 7.5 mg/kg IV once a day combined with ceftriaxone 100 mg/kg IV in two divided doses or Cloxacillin 50 mg/kg IV 8 hourly
- Shift to oral drugs as soon as the child is able to take orally, except those with shock or complicated Pneumonia, where longer parenteral therapy is advised

Total duration of antibiotics in Severe Pneumonia:

- If the clinical response is within 48 hrs then antibiotics should be given for 7 days
- If the clinical response after 48 hrs then antibiotics should be given for 10 days

2.2.3- Oxygen therapy

When to start oxygen therapy

All children who have any problem with their airway or breathing, are given oxygen first, while they continue to be assessed for other problems. Oxygen therapy should be guided by pulse oximetry.

- Pulse oximetry is recommended to determine the presence of hypoxaemia in all children with emergency signs
- When the child has only respiratory distress, oxygen supplementation is recommended at SpO_2 <90%
- Children presenting with other danger/emergency signs with or without respiratory distress should receive oxygen therapy if their SpO_2 is <94%

- When pulse oximeter is not available or pulse oximeter does not pick saturation in conditions like shock, hypothermia, the necessity for oxygen therapy should be guided by clinical signs although they are less reliable

Oxygen should be given to children with very severe pneumonia who have:

- SpO_2 <90%
- Central cyanosis
- Nasal flaring
- Inability to drink (when this is due to respiratory distress)
- Grunting with every breath
- Depressed mental status (drowsy, lethargic)

Less specific signs:

- Severe lower chest wall in-drawing
- Labored or very fast breathing (Respiratory rate ≥70/min)
- Head nodding

Sources of oxygen to treat hypoxemia

There are three possible sources of oxygen:

1. Oxygen concentrators
2. Oxygen cylinders
3. Central supply of oxygen

Oxygen delivery

- If the **child is unconscious, manage airway and do suction** to maintain the airway. In an alert child with respiratory difficulty allow him to remain in a position of comfort because they will assume a position that promotes optimal airway patency and minimizes respiratory effort
- Give oxygen to a child in a **non-threatening manner as anxiety increases oxygen consumption** and possibly respiratory distress
- If a child is upset by one method of oxygen support, you should attempt to deliver the oxygen by an alternative technique
- **Nasal prongs are the preferred method of delivery in most circumstances,** as they are safe, non-invasive, reliable and do not obstruct the nasal airway. Nasal prongs are device that ends in two short tapered tubes designed to lie just within the nostrils. Standard flow rate (0.5-1 L/min for neonates, 1-2 L/min for infants and 1-4 L/min for older children. Humidification is not required with standard flow rates as natural nasal mechanisms heat and humidify the inspired oxygen

Picture 2: Nasal Prongs correctly positioned and secured

- **Nasal catheter 8F size for neonates and infants may be used if nasal prongs are not available.** Pass the catheter for a distance equal to the distance from side of the nostril to the inner margin of the eyebrow. Nasopharyngeal catheters may be used as an alternative, measure the distance from nose to the tragus of the ear. Humidification is required for nasopharyngeal catheter. Care should be taken to keep the nostrils clear of mucus to avoid blockage

Key messages

- Nasal prongs are the preferred oxygen delivery method in most circumstances
- **Humidification is only necessary with oxygen delivery methods that bypass the nose,** it is generally not necessary when oxygen is delivered through nasal prongs or nasal catheters
- Use of head boxes, face masks and tents are not recommended as they result in oxygen wastage and potentially harmful (due to carbon dioxide toxicity)
- Humidification is essential when cold oxygen is delivered from cylinder through nasopharyngeal catheter or when high oxygen flow rates are used. Humidifier bottles/reservoirs should be cleaned regularly to avoid bacterial contamination

- The use of head boxes, face masks are not recommended especially in settings where oxygen supply is limited. They are expensive and lead to oxygen wastage

Note: Prongs or catheters should be removed and cleaned at least twice a day

Monitoring during oxygen therapy

- Monitor the child at least every 3 hours to identify and correct any problems, including:
  - Oxygen saturation, by pulse oximeter
  - Position of nasal prongs/nasal catheter
  - Leaks in the oxygen delivery system
  - Oxygen flow rate
  - Airway obstructed by mucus (clear the nose with a moist wick or by gentle suction)

Duration of Oxygen Therapy

- Oxygen therapy can be stopped when a child is clinically stable (has no emergency signs) and maintains a peripheral capillary oxygen saturation ≥90% in room air.
- When the child is stable and improving, take the child off oxygen for 15 min. If the SpO_2 readings in room air remain ≥90%, discontinue oxygen but check again 30 min later and every 3 hours thereafter on the first day off oxygen to ensure that the child remains stable. Supplemental oxygen is best interrupted in the morning shift when there is likely to be adequate staff to observe the child throughout the day.

2.2.4- Supportive care

- Remove any thick secretions at the entrance to the nasal passages or throat by gentle suction, which the child cannot clear
- If the child has fever (≥ 38.5˚ C), give paracetamol
- Provide maintenance IV fluid if child cannot accept oral feeds. Stop IV fluids gradually when the child is accepting orally satisfactorily
- If wheeze is present, give bronchodilator(salbutamol)
- Encourage the child to feed as soon as child is able to take feeds
- There is no role of cough syrup (may be harmful)
- Ensure vaccination/ Nutritional advice

2.2.5- Monitoring of Severe Pneumonia Cases

Child should be checked by a nurse at least every 3 hours and by a doctor at least twice a day (refer to annexure7). In the absence of complications, there should be signs of improvement like breathing slower, less indrawing of the lower chest wall, less fever, improved ability to eat and drink and better oxygen saturation in next 48 hours

Key messages

- Children receiving oxygen should be clinically monitored at least twice a day by pulse oximetry
- $Sp0_2$ is the most critical vital sign
- A nurse should check 3 hourly for correct oxygen delivery
- At least once a day when child is clinically stable (no emergency signs and $Sp0_2$ more than 90%) should be discontinued from oxygen for 10-15 minutes and carefully examined for changes in clinical signs and $Sp0_2$ to determine the need for supplemental oxygen
- Children should not be discharged until their $Sp0_2$ has been stable at ≥90% in room air for at least 24 hours, until all danger signs have resolved and appropriate home treatment has been explained and understood by the caregivers

2.2.6- Tuberculosis

Consider the possibility of tuberculosis in a child with Pneumonia if:

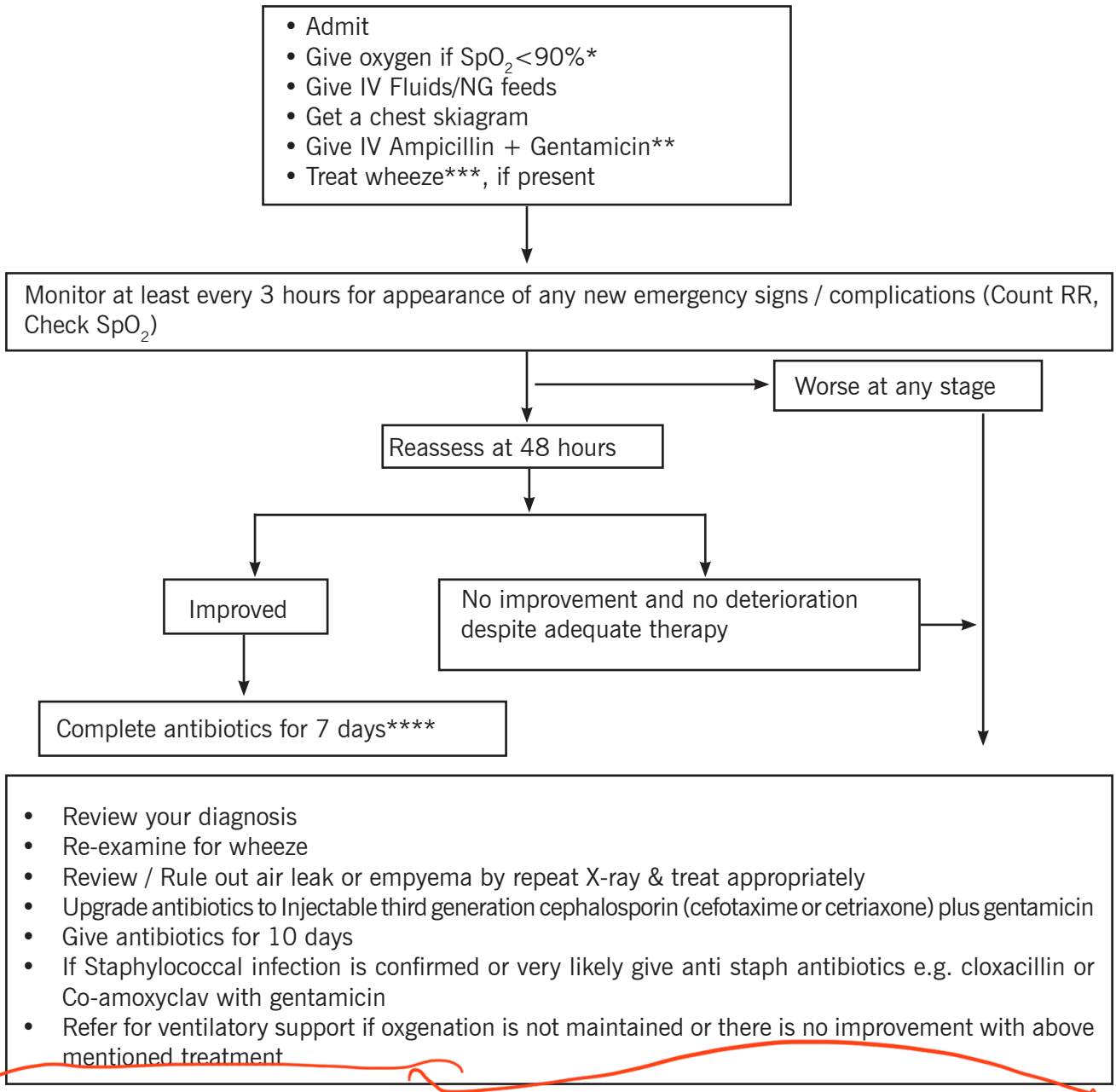
- Child has unremitting fever and cough for more than 2 weeks and cause of fever cannot be found
- Contact with a pulmonary TB case
- Lack of response of respiratory symptoms and signs to broad-spectrum antibiotics.
- Weight loss or failure to thrive

2.2.7- Pneumonia in a child with Severe Acute Malnutrition (SAM)

Pneumonia is common and is more likely to be fatal in children with severe acute malnutrition. Besides it may be caused by wider range of bacteria including gram negative bacteria. Clinical presentation is less specific and may overlap with sepsis.

- The child should be admitted in view of severe acute malnutrition and be treated as severe pneumonia even though they may not have chest indrawing or signs of severe respiratory distress. Severely malnourished children sometimes can have pneumonia without fast breathing though will have other signs of respiratory distress like accessory muscle use and nasal flaring. A chest radiograph should be obtained, wherever possible
- Inj. Ampicillin and Gentamicin is the antibiotic of choice as it gives an extended cover for gram negative infections which are seen more often in cases with SAM. The antibiotics are to be given for 7-10 days. Inj. Cloxacillin should be added whenever there is suspicion of staphylococcal infection
- Management of severe acute malnutrition i.e. maintaining temperature, prevention and treatment of hypoglycemia and appropriate feeding is essential additional treatment needed for favorable outcome
- Pulmonary tuberculosis and HIV should be diagnostic consideration if the patient does not show expected response

Flow Chart 1- Management of Severe Pneumonia cases (2-59 months) admitted in health facilities



** <94% in presence of other emergency signs*
*** If staphylococcal infection is suspected, give anti-staph antibiotic like cloxacillin and gentamicin. In case of severe pneumonia with septic shock consider Ceftriaxone and Vancomyci*
**** In case the child improves significantly with bronchodilator therapy, review the diagnosis*
***** Shift to oral drugs as soon as the child is able to take orally*

2.3- Outpatient case management of Pneumonia/PSBI in young infants (0-59 days)

It is clinically difficult to differentiate between pneumonia, sepsis & meningitis, in young infants and the treatment of these conditions is quite similar. Therefore, these conditions are grouped as Possible Serious Bacterial Infection (PSBI). The process to assess and classify the young infant is very similar to the one you learnt for the sick child 2 months to 5 years.

For case management for the young infant age up to 2 months, Follow the below steps:

- Greet the mother and give a friendly smile
- Ask the mother what the young infant's problems are
- Record what the mother tells you about the infant's problems
- Determine if this is an initial or follow-up visit for this problem

ASK: Is the infant having **difficulty in feeding**?

- A young infant who was feeding well earlier but is not feeding well now may have a serious infection. These infants who are either not able to feed or are not feeding well should be referred urgently to hospital

ASK: Has the **infant had convulsions**?

- Ask the mother questions on whether the young infant has suffered from convulsions or not. Use the local term (fits) for convulsions

LOOK: Count **the breathing rate** as you have learnt for the sick child

- Since the breathing rate of the young infant is often irregular, repeat the count if elevated (60 breaths per minute or more).
- The second count is accepted as the final count
- If the young infant has fast breathing (60 breaths per minute or more), the young infant may have pneumonia. This is considered serious in a young infant

If the child's age is	The child has fast breathing if you count
Below 2 months	60 breaths per minute or more during second count

LOOK: For **severe chest indrawing**

- Mild chest indrawing is normal in a young infant because the chest wall is soft. Severe chest indrawing is very deep and easy to see. Severe chest indrawing is a sign of pneumonia and is serious in a young infant

FEEL: Measure **axillary temperature** (if not possible feel for fever or low body temperature)

- Fever (axillary temperature more than 37.5˚C) is uncommon in the first two months of life. If a young infant has fever, this may mean the infant has a serious bacterial infection
- Young infants can also respond to infection by dropping their body temperature to below 35.5˚C
- Keep the thermometer in the axilla (armpit) and then hold the young infant's arm against his body for 5 minutes before reading the temperature. If you do not have a thermometer, feel the infant's abdomen or armpit and determine if it feels hot or cold to touch

LOOK: At the **young infant's movements.**

- Does the young infant move only when stimulated? Are there no movements even after the young infant is stimulated? Young infants often sleep most of the time, and this is not a sign of illness. If a young infant does not wake up during the assessment, ask the mother to wake him
- An awake young infant will normally move his/her arms or legs or turn his/her head several times in a minute if you watch him/her closely. Observe the infant's movements while you do the assessment
- If the infant is awake but has no spontaneous movements, gently stimulate the young infant. If the infant moves only when stimulated and then stops moving, or does not move even when stimulated, it is a sign of severe disease

The classification for Possible Serious Bacterial Infection is as follows:

Signs	Classify as	Management
• Not able to feed or • Convulsions or • Fast breathing (60 breaths per minute or more) or • Severe chest indrawing or • Axillary temperature 37.5˚C or above (or feels hot to touch) or • Axillary temperature less than 35.5 0C (or feels cold to touch) or • Movement only when stimulated or no movement at all	**POSSIBLE SERIOUS BACTERIAL INFECTION**	• Give first dose of oral Amoxicillin and intramuscular Gentamicin • Treat to prevent low blood sugar • Warm the young infant by Skin to Skin contact if temperature less than 36.5˚C (or feels cold to touch) while arranging referral • Advise mother how to keep the young infant warm on the way to the hospital • Refer urgently to hospital

- Warm the young infant by skin to skin contact with mother/care giver if temperature less than 36.5°C (or feels cold to touch) while arranging referral and during transport
- Treat to prevent low blood sugar:
  - If the child is able to breastfeed: Ask the mother to breastfeed the child
  - If the child is not able to breastfeed but is able to swallow: Give 20-50 ml (10 ml/kg) expressed breastmilk or locally appropriate animal milk (with added sugar) before departure. If neither of these is available, give 20-50 ml (10 ml/kg) sugar water
  - To make sugar water: Dissolve 4 level teaspoons of sugar (20 grams) in a 200-ml cup of clean water
- Make all efforts to ensure that a young infant with PSBI is referred for admission to the nearest health facility for appropriate treatment after giving the first dose/pre-referral doses of Injection Gentamicin & Syrup Amoxicillin
- In case referral is refused by caregivers or not feasible, management of illness should be done using oral Amoxicillin twice a day & injection Gentamicin once a day for 7 days
- Give Injection Gentamicin once a day and Oral Amoxicillin twice a day for 7 days if referral is refused/ not possible

Table 3: Antibiotic Therapy for management of PSBI- Pre-referral dose (0-2 months)*

Young Infant's Weight	Amount of Gentamicin to be given intramuscularly as Injection (vial* contains 80 mg in 2 ml)	Amount of Amoxicillin to be given per-orally as Syrup*** (contains 125mg./ 5 ml.)	Amount of Amoxicillin to be given per-orally as tablet (contains 250 mg.)
	Dosage 5 mg/kg/dose * once a day	Dosage 25 mg/kg/dose** twice a day	
Less than 1.5 Kg	To be referred to higher facility		
Above 1.5 kg – up to 2.0 Kg	0.2 ml	2 ml	¼
Above 2.0 kg – up to 3.0 Kg	0.3 ml	2.5 ml	½
Above 3.0 kg – up to 4.0 Kg	0.4 ml	3 ml	½
Above 4.0 kg – up to 5.0 Kg	0.5 ml	4 ml	½

*Precaution-If the treatment is to be continued gentamicin vial can be used for entire 7 days, provided it is stored properly and its content do not change colour or have turbidity. In case of any it's is better to use a new vial
**The health provider will instruct the mother how to reconstitute the syrup if it is in powder form
***Measuring cap is used to measuring dose of Amoxicillin, the amount of medicine to be given is up to 2.5 ml mark of cap for babies weighing up to 4.0 kg and for babies weighing 4.0 kg- up to 5.0 kg, the dose is 5 ml mark of cap. Similarly, if a teaspoon is used instead of a syringe dose is ½ tsp for babies weighing up to 4.0 kg and for babies weighing 4.0 kg- up to 5.0 kg, the dose is 1 tsp

COMMUNITY & OUTPATIENT MANAGEMENT OF YOUNG INFANTS (0-2 MONTHS) WITH PNEUMONIA/PSBI*

FLOW CHART

Step 1: ASSESS

- Not able to feed, or
- Convulsions, or
- Fast breathing (60 breaths per minute or more), or
- Severe chest indrawing, or
- Axillary temperature 37.5°C or above (or feels hot to the touch), or
- Axillary temperature less than 35.5°C (or feels cold to the touch), or
- Movement only when stimulated or no movement at all

Step 2: Classify

- If one or more features are present: Classify as Possible Serious Bacterial Infections (PSBI)

Step 3: Pre-referral dose & refer

ASHA (HOME BASED)

1. Counsel the mother/caregiver for urgent referral to a health facility.
2. Arrange transport facility using JSSK scheme.
3. Give pre-referral dose of Oral Amoxicillin.

ANM

1. Give pre-referral dose Inj. Gentamicin and Oral Amoxicillin.
2. Counsel the mother/caregiver for urgent referral to the health facility (By ANM ; to the nearest health facility).
3. Arrange transport to the facility using JSSK scheme.
4. Fill up the Treatment Card and give counter slip to mother /caregiver to take with them to the health facility equipped with standard in-patient treatment.

REFERRAL TO THE HEALTH FACILITY

Young Infant's weight	Amount of Gentamicin to be given intramuscularly as Injection (vial* contains 80 mg in 2ml	Amount of Amoxicillin Syrup to be given per-orally** contains 125mg /5ml	Amount of Amoxicillin to be given per-orally as tablet (contains 250mg.)
	Dosage 5 mg/kg /dose**once a day	Dosage 25 mg/dose*** twice a day	
Less than 1.5kg	To be referred to higher facility		
Above 1.5 kg up to 2.0 kg	0.2 ml	2 ml	¼
Above 2.0 kg up to 3.0 kg	0.3 ml	3.5 ml	½
Above 3.0 kg up to 4.0 kg	0.4 ml	3 ml	½
Above 4.0 kg up to 5.0 kg	0.5 ml	4 ml	½

Step 4: Manage if referral not possible

ADMISSION/REFERRAL REFUSED OR NOT POSSIBLE

Medical officer/ANM to start Inj. Gentamicin and Oral Amoxicillin

1. ANM to inform Medical Officer /Nurse at the health facility about the young infant's condition and the treatment.
2. Teach the mother how to give oral Amoxicillin at home for a total of 7 days.
3. Counsel the mother on how to keep young infant warm and breast feed frequently.
4. Fill up the Treatment Card
5. Inform the concerned ANM /ASHA about the young infant's condition and the treatment, and plan for follow-up.

Step 5: Follow up

ANM (PHC/HSC/HSWC level)

1. Ensure daily administration of Inj. Gentamicin and oral Amoxicillin for a total of 7 days.
2. In case the young infant is unable to visit the health facility, the ANM should visit the home of the infant and administer Inj. Gentamicin.
3. Check young infant's condition and presence of danger signs.
4. ANM should inform the Medical Officer/Nurse at the nearest health facility about the progress.
5. In case the young infant's condition worsens or there is no improvement within 24-48 hours of starting treatment, refer immediately under the JSSK scheme to a facility where standard treatment is available.

*Possible Serious Bacterial Infection

**If the treatment is to be continued, same vial can be resued for 7 days, provided it is stored properly in a cold, dry & dark place and its colour does not change or have turbidity. In case of any doubt it is better to use a new vial.

***Teach the mother how to give Amoxicillin at home.

SGANS
साँस
निमोनिया नहीं, तो बचपन सही

2.4- Facility based management of Pneumonia/PSBI in young infants (0-59 days)

The steps for management of PSBI/Pneumonia in Young infants admitted in health facilities are:

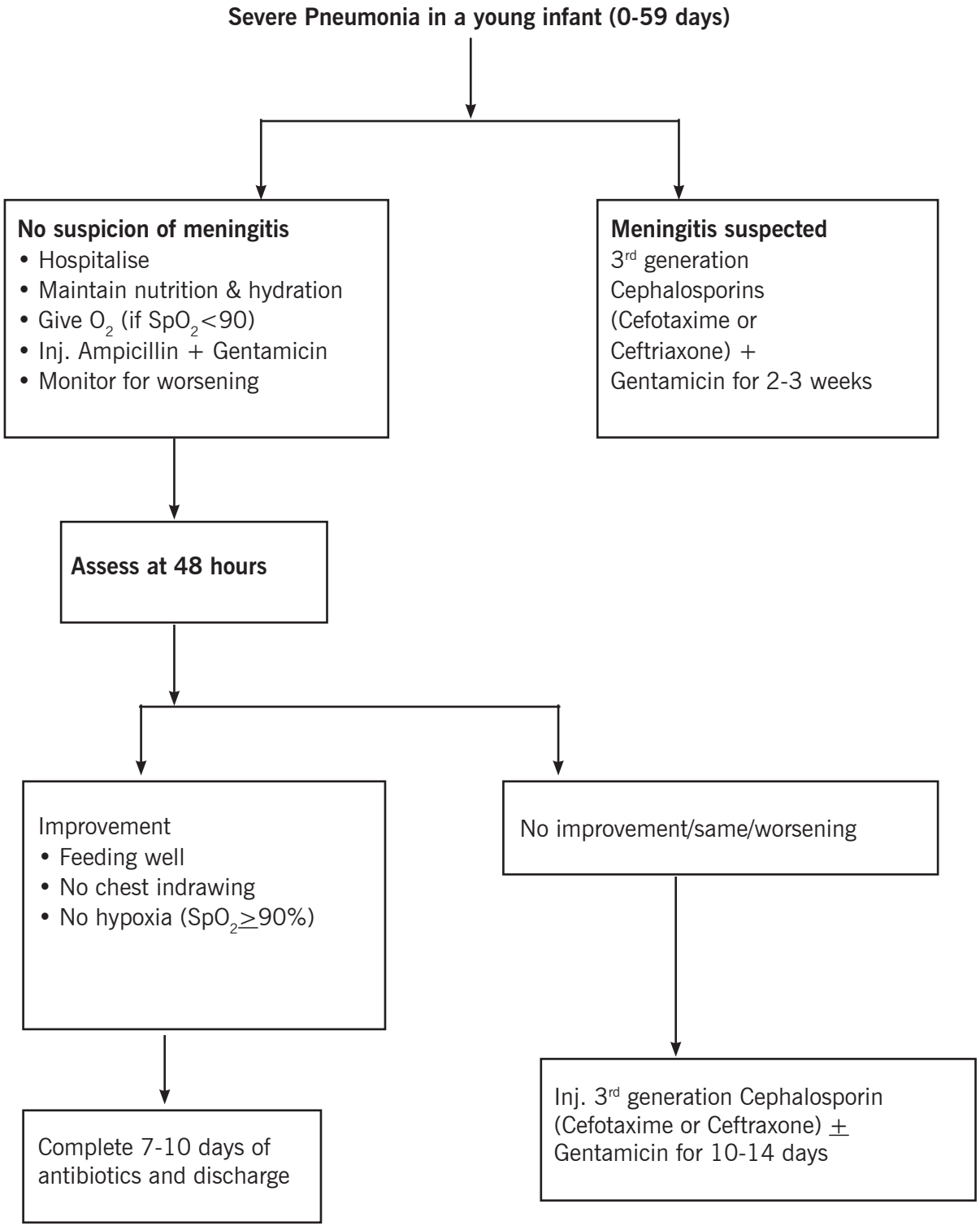
- Give Antibiotics
- Injection Ampicillin and Gentamicin is used as initial treatment. In case there is suspicion of concomitant meningitis a combination of Injection Cefotaxime and Gentamicin should be used instead
- Give Oxygen where required (presence of cyanosis, grunting, severe respiratory distress i.e. RR > 70/bpm, SpO_2<90%)
- Keep the infant warm
- Continue Breast-feeding to prevent hypoglycemia. If the infant is unable to suck he should be given expressed breast milk
- Infants on oxygen should be given intravenous fluids until the infant is able to take orally

Table 4: Antibiotic Therapy for Pneumonia/Sepsis In Young Infants

Antibiotic	Each Dose	Frequency		Route	Duration
	(mg/kg/dose)	< 7 days age	> 7 days age		Days
Inj. Ampicillin*	50	12 hrly	8 hrly	IV, IM	7-10
And Inj. Gentamicin or	5	24 hrly	24 hrly	IV, IM	7-10
Inj. Amikacin	15	24 hrly	24 hrly	IV, IM	7-10

*If concomitant meningitis is suspected the drugs should be given IV and Inj. Cefotaxime 50 mg/kg IV 8 hourly is used instead of Ampicillin. The total duration of therapy in meningitis is 2-3 weeks. In case of suspected staphylococcal infection Injection Cloxacillin 50mg/kg 8 hourly is to be added to the regime

Flow Chart 2-Management of Pneumonia/PSBI in Young Infants



Section 3: Case studies for Pneumonia Management

Case 1: Raman

Raman is a 6-week-old infant. His weight is 3.5 kg. His axillary temperature is 37.5ºC. He is brought to the health facility because he is having difficulty breathing. The health facility staff first checks the young infant for signs of possible bacterial infection. His mother says that Raman is less active and not breast feeding well. The health staff counts 74 breaths per minute. He repeats the count. The second count is 70 breaths per minute. He finds that Raman has severe chest in-drawing. There is no pus in his ears, the umbilicus is normal, and there are no skin pustules.

1. What is your classification?

   .....

   .....

2. How will you manage the young infant ?

   .....

   .....

   .....

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   .....

3. The mother is not willing for hospitalization. How will you manage in such a situation?

   .....

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Case 2: Seema

Seema is 4 months old and weighs 4.2 kg. Seema is having cough and cold for last three days. The baby's respiratory rate is 65 breaths per minute. She is awake, not lethargic, accepting breast feeds and has no chest in- drawing or convulsions.

1. What is your classification?

.....

.....

2. How will you manage the child?

.....

.....

.....

.....

.....

Case 3: Ankita

Ankita is 2 years old and weighs 8.5 kgs. Her axillary temperature is 38.5° C. The mother says that she has cough for five days and difficulty in breathing for the last two days. Ankita is lethargic and not accepting feeds since last night. Her respiration rate is 70 breaths per minute. She has no stridor but has chest in-drawing. The healthworker records her SpO_2 of 88% using pulse oximeter.

1. What is your classification?

.....

.....

2. How will you manage the child?

.....

.....

.....

.....

.....

Annexures

Annexure- 1: Oxygen delivery systems and protocol

1. Use of Oxygen cylinder

1. Ensure all the parts are available (oxygen cylinder, concentrator, hood, nasal prongs, mask, nasal catheter etc.)
2. Ensure oxygen cylinder is secured on flat surface on a trolley.
3. Attach the regulator
4. Attach flow meter to the regulator to set the flow rate. Ensure the flow meter is vertical
5. Attach humidification bottle to the flow meter. Fill clean water up to the mark level on the bottle
6. Attach oxygen tube to the humidifier
7. Using a spanner/Key opens the cylinder. Set the desired flow rate on the flow meter. Ensure that there is no leak
8. Connect oxygen tube to the nasal prongs/ oxygen hood/ face mask/ or catheter / to deliver oxygen to the patient
9. Place the nasal prongs just inside the nostril and clear the nose if blocked
10. Secure the nasal prongs by taping along the cheek
11. Severely ill children with signs of obstructed breathing, central cyanosis, severe respiratory distress or signs of shock or who are unconscious should receive oxygen initially by nasal prongs at a standard flow rate (0.5 to 1 liter/min for neonates and 2-4 L/min for older children) or through an appropriately sized mask (>4 L /min) to reach a peripheral capillary oxygen saturation ≥94 %.
12. Monitoring of progress: When the child is stable and improving take the child off oxygen for 15 min, if the Spo2 reading in room air remain ≥ 90 %, discontinue oxygen, but check again 30 min later and every 3 hrs thereafter on the first day off oxygen to ensure that the child remains stable.
13. Nasal prong
    a. It is used for delivering oxygen to baby
    b. Has two port holes, O2 inlet and baby port
    c. Delivers FiO2-90% with ports closed, 60% with one port opened and 30% with both ports opened.
    d. Nasal prong is disposable

2. Use of Oxygen Concentrator

1. Plug in the power cable. A green light indicating “power on” comes on.
2. Switch on the concentrator. Once the concentrator is switched on, a red/ yellow light will come up
3. Check the distilled water level in the humidifying jar and ensure that it is filled up to the marking
4. Adjust the oxygen flow as per need. The red/yellow light will be on till the desired concentration of oxygen is achieved
5. Place the nasal prongs inside the baby’s nostrils and fixes it with a tape, ensuring that it fits snugly.

Key points to remember, Maintenance

1. Coarse Filter- ensure it is dust free and is washed daily
2. Zeolite granules- change every 20,000 hrs. or as per manufacturer’s recommendation
3. Bacterial filter-- change every 1 year or as per manufacturer’s recommendation

Annexure-2: Use of Metered Dose Inhaler and Nebuliser

1. Metered Dose Inhaler

1. Remove the cap from the inhaler and shake the inhaler well
2. Ask the patient to take a few deep breaths and then breathe out gently
3. Ask the patient to immediately place the mouth piece inside the mouth with lips forming a seal
4. Instruct the patient to press the inhaler and at the same time begin a slow, deep breath and continue to breathe slowly and deeply over 3 - 5 seconds. Hold the breath for 10 seconds and then resume normal breathing
5. Advise to repeat the above steps when more than one puff is prescribed
6. Advise to wait 1 minute between actuations (puff); this may improve penetration of the second actuation into lung airways
7. Ask the patient to recap the MDI

2. Metered Dose Inhaler with Spacer

1. Remove the cap from the inhaler and shake the inhaler well
2. Attach the mask to the mouthpiece of the spacer
3. Insert the inhaler mouthpiece into the slot of the spacer (the inhaler should fit snugly and without difficulty)
4. Place the mask over the child's nose and mouth so that it makes a seal with the face
5. Press down on the inhaler canister to spray one puff of medicine into the spacer
6. Hold the mask in place and allow the child to breathe in and out slowly for five breaths
7. If child needs another dose, waits for 2-3 minutes, shake the inhaler and repeats steps 4 to 7

Note: Inhalation by MDI spacer needs four puffs at 2-3 minutes interval to get an equivalent dose for a single salbutamol nebulization.

3. Nebulizer

1. Wash hands thoroughly before using a nebulizer
2. Makes sure the equipment is clean
3. Measure the correct dose of medication to be administered and pour into the nebulizer chamber (cup) and add saline solution to make the volume to 3 ml. The dose of Salbutamol is 2.5 mg (i.e. 0.5 ml of the 5 mg/ml nebulizer solution). This can be given 1-4-hrly initially, reducing to 6-8 hrly once the child's condition improves. If necessary in severe cases, it can be given more frequently.
4. If the medicine is in single-use vials, twist the top off the plastic vial and squeeze the contents into the nebulizer cup
5. Connect the mouthpiece, or mask to the T-shaped elbow (face mask for smaller children and mouthpiece for older children)
6. Connect the nebulizer tubing to the port on the compressor. Turn the compressor on and check the nebulizer for misting
7. Hold the nebulizer in upright position to avoid spillage, while using mask ensure that it is fitting well. In older children ask the patient to keep the mouthpiece inside the mouth and close lips around it
8. Ask the patient to take slow deep breaths and if possible hold the breath for up to 10 seconds before exhaling. Occasionally, tap the side of the nebulizer to help the solution drop to where it can be misted.

Annexure -3: Use of Pulse Oximeter

1. Connect to the mains.
2. Switch on the machine
3. Set the alarm limits for heart rate 80-140 BPM
4. Set saturation alarm limits 90-97%
5. Connect the patient sensor to the pattient by wrapping it around the baby's hand or foot.
6. Pulse oximeter starts detecting signal from the patient and displays heart rate and saturation in a few seconds
7. The values displayed may not be reliable in the presence of shock, cold peripheries, excessive movement, electrical interference and exposure of probe to bright ambient light.
8. Values are reliable when the plethysmographic waveform or bar signals is good
9. Values are reliable when the display is constant and not blinking or repeatedly changing

Picture 3: Tabletop Pulse Oximeter

Parts of the Tabletop Pulse Oximeter

- Display Panel
  - Numeric display
  - Graphic display
- Control buttons
  - Power/standby button
  - SpO2 alarm setting button
  - HR alarm setting button
  - Set button (alarm, volume, trend)
  - Alarm silence button
- An electric cable
- An extension cable for attachment of the patient sensor
- A patient sensor which is to be connected to the extension cable

Cleaning and disinfection

- Clean display panel with moist soft cloth
- Clean body with soft cloth dampened with soap water followed by moist soft cloth
- Clean reusable sensors with spirit after each patient use

Recommendation: Pulse Oximetry is recommended to determine the presence of hypoxaemia in children. When child has only repiratory distress, oxygen supllementation is recommended at $SpO_2 < 90$ %. Children presenting with other ETAT emergengy sign with or without respiratory distress should receive oxygen therapy if their SpO_2 is< 94 %.

Trouble Shooting

Alarm/Display Message	Possible cause	Correction action
Check sensor	Motion, low perfusion, wrong position	Reposition relocate
Check probe	Probe not detected	Connect probe, check probe, connection
Pulse search	Pulse not detected Initialising Low perfusion/ movement/edema	Change sensor
Interference detected	Erratic Signal with electromagnetic waves in vicinity like TV, Mobile Phone	Remove Interference
Low Battery	Low internal battery	Connect to AC Power
Sensor failure	Broken cable, faulty photodiode sensor damage	Replace sensor
System failure	Internal component failed	Unit needs service/change
Ambient light	Excessive light or sensor	Relocate, cover with opaque paper/cloth

Do and Don'ts

- Inspect sensor site every 2 to 4 hours for any erythema
- Change sensor site every 4-6 hourly
- Do not apply sensor too tightly
- Do not apply probe to edematous or bruised

Side effects and dangers

- Failure of operation.
- Explosion hazards in presence of any flammable anesthetic mixture.
- Local reddening, blistering, skin discoloration, burn etc. because of the sensor placement.

Maintenance

- Clean the oximeter as necessary
- Recharge the battery as necessary
- Replace the fuses in power module as necessary
- Comprehensive/ Annual maintenance contract
- Do not knot, pull or apply traction to sensor cable or extension cable
- Handle carefully and gently

Annexure -4: Mother and Child Protection Card

State logo

सत्यमेव जयते

MINISTRY OF HEALTH AND FAMILY WELFARE
MINISTRY OF WOMEN AND CHILD DEVELOPMENT

MOTHER AND CHILD PROTECTION CARD (MCP CARD)

Be Wise! Get your child fully immunized

POSHAN Abhiyaan

Keep this card safe and carry along with you during every visit to Village Health Sanitation and Nutrition Day, Anganwadi Centre, Health Centre and Hospital

2018 Version

Prevention of Pneumonia

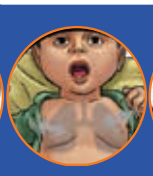
Keep children covered in warm woollen clothes during winters and do not let them walk barefoot

Do not keep new born without clothes

Use LPG gas stove for cooking to avoid smoke in the house

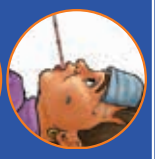
Identification of Pneumonia

Coughing gets worse



Fast breathing

Chest indrawing



Fever

Pneumonia can be identified by breath counts

For less than 2 month baby when breath count is more than 60 per minute	For 2 month to 1 year baby when breath count is more than 50 per minute	For 1 year to 5 year child when breath count is more than 40 per minute

Annexure-5

Case recording forms

Management of the Sick Child Age 2 Months Up to 5 Years

Name : _____ Age: ____ Sex: M____ F____ Weight____kg Temperature: ____ °C Date

ASK: What are the child's problems? _____ Initial Visit? ___ Follow-up Visit? ____

ASSESS (Circl all signs present) **CLASSIFY**

CHECK FOR GENERAL DANGER SIGNS
NOT ABLE TO DRINK OR BREASTFEED LETHARIGIC OR UNCONSCIOUS
VOMITS EVERYTHING
CONVULSIONS CONVULSING NOW

General Danger sign present?
Yes___ No ___
Remember to use danger sign
When Selecting Classification

DOES THE CHILD HAVE COUGH OR DIFFICULT BREATHING? Yes____ No____

- For how long? _____ Days
- Count the breaths in one minute
  _____ breaths per minute. Fast breathings?
- Look for check in drawing.
- Look and listen for stridor.
- Look and listen for wheezing.

DOES THE CHILD HAVE DIARRHOEA? Yes____ No____

- For how long? _____ Days
- Is there blood in the stool?
- Look at the child's general condition. Is the child:
  Lethargic or unconscious?
  Restless and irritable
- Look for sunken eyes.
- Offer the child fluid. Is the child:
  Not able to drink or drinking poorly?
  Drinking eagerly, thirsty?
- Pinch the skin of the abdomen. Does it go back:
  Very slowly (longer than 2 seconds)?
  Slowly?

DOES THE CHILD HAVE FEVER? (by history feels hot/ temperature 37.5°C or above) Yes____ No____

PF predominant area: Yes No

- Fever for how long? ____Days
- If more than 7 days, has fever been present every day?
- Has the child had measles within the last 3 months
- Look or feel for stiff neck.
- Look for runny nose.
  Look for signs of MEASLES:
- Generalized rash
- One of these: cough, runny nose, or red eyes

Test POSITIVE? P. falciparum P. vivax NEGATIVE?

.....

If the child has measles now or within the last 3 months?

- Look for mouth ulcers
  If Yes, are they deep and extensive
- Look for pus draining from the eye.
- Look for clouding of the comea.

DOES THE CHILD HAVE AN EAR PROBLEM Yes____ No____

- Is there ear pain?
- Is there ear discharge?
  If yes, for how long? ___ Days
- Look for pus draining from the ear.
- Feel for tender swelling behind the ear.

THEN CHECK FOR ACUTE MALNUTRITION

- Look for oedema of both feet.
- Determine WFH/L z-score:
  Less than-3? Between -3 and -2? -2 or more?
- Child 6 months of older measure MUAC ____ mm

_____

THEN CHECK FOR ANEMIA

- Look for palmar pallor.
  Severe palmar pallor? Some palmar pallor? No pallor?

CHECK THE CHILD'S IMMUNIZATION, PROPHYLACTIC VITAMIN A & IRON-FOLIC ACID STATUS

___ BCG	_____ HepB0	_____ Penta1	_____ Penta2	_____ Penta3	_____ MEASLES/MR	_____ DPT B-1 +OPV
_____ OPV 0	_____ OPV 1	_____ OPV 2	_____ OPV 3 +IPV	_____ VITAMIN A	_____ MEASLES/MR2	_____ DPTB—2
_____ PCV1	_____ PCV2	_____ PCV3	_____ Rota- 1	_____ Rota- 2	_____ Rota- 3	_____ IFA

Return for next immunization or vitamin A or IFA supplement on:

_____
(Date)

ASSESS CHILD'S FEEDING If child has MODERATE ACUTE MALNUTRITION or ANEMIA or is less than 2 years old

- Do you breastfeed your child? Yes___ No___
  If yes, how many times in 24 hours? ___ times. Do you breastfeed during the night? Yes___ No ___
- Does the child take any other food or fluids? Yes___ No___
  If Yes, what foods or fluids? _____
  _____
  How many times per day? ___ times, What do you use to feed the child and how? _____
  How large are the servings? _____
  Does the child receive his own serving? _____ Who feeds the child and how? _____

TREAT

Remember to refer any child who has a general danger sign and no other severe classification.

Return for follow up in: _____

Advise mother when to return immediately.

Give any immunizations, Vitamin A, Deworming or IFA supplements needed today: _____

Counsel the mother about her own health.

Feeding /practices to support child's development

Advice_____

MANAGEMENT OF THE SICK YOUNG INFANT AGE UP TO 2 MONTHS

Name : _____ Age: ____ Sex: M____ F____ Weight____kg Temperature: ____°C Date
ASK: What are the infant's problems? _____ Initial Visit? ___ Follow-up Visit? ____
ASSESS (Circl all signs present) CLASSIFY

CHECK FOR POSSIBLE BACTERIAL INFECTION/JAUNDICE

- Is the infant having difficulty in feeding?
- Has the infant had convulsions?
- Count the breaths in one minute_____ breaths per minute. Repeat if elevated _____ Fast breathing?
- Look for severe chest indrawing.
- Look at the umbilicus. Is it red or draining pus?
- Look for skin pustules.
- Measure axillary temperature (if not possible, feel for fever or low body temperature):
- 37.5°C or more (or feels hot)?
- Less than 35.5°C?
- Less than 36.5°C but above 35.4°C (or feels cold to touch)?
- Look at young infant's movements. Movement only when stimulated or no movement at all.
- Look for jaundice. Are the palms and soles yellow?

DOES THE YOUNG INFANT HAVE DIARRHOEA? Yes____ No____

- Look at the young infant's general condition. Is the infant:
  - Lethargic or unconscious?
  - Restless and irritable?
- Look for sunken eyes.
- Pinch the skin of the abdomen. Does it go back:
  - Very slowly (longer than 2 seconds)?
  - Slowly

THEN CHECK FOR FEEDING PROBLEM & VERY LOW EIGHT

- Is there any difficulty feeding? Yes___ No___
- Is the infant breastfed? Yes___ No___

If Yes, how many times in 24 hours? ____ times

- Does the infant usually receive any other foods or drinks? Yes___ No___

If Yes, how often?

- What do you use to feed the infant?

- Determine weight Very Low weight (<1800 gm)___ Low weight (1800-2500 gm)___ Not low weight (>2500 gm)___

If the infant has no indication to refer urgently to hospital:

.....

ASSESS BREASTFEEDING:

- Has the infant breastfed in the previous hour?

If infant has not fed in the previous hour, ask the mother to put her infant to the breast. Observe the breastfeed for 4 minutes.

- Is the infant able to attach? To check attachment, look for.
- Chin touching breast Yes___ No___
- Mouth wide open Yes___ No___
- Lower lip turned outward Yes___ No___
- More areola above than below the mouth Yes___ No___

no attachment at all *not well attached* *good attachment*

- Is the infant suckling effectively (that is, slow deep sucks, sometimes pausing)?

no suckling at all not suckling effectively sucking effectively

- Look for ulcers or white patches in the mouth (thrush).
- Does the mother have pain while breastfeeding? If yes, then look for
  - Flat or inverted nipples, or sore nipples
  - Engorged breasts or breast abscess

_____

CHECK THE YOUNG INFANT'S IMMUNIZATION STATUS

_____	_____	_____	_____	_____
BCG	HepB0	Penta1	Rota Virus	PCV
_____	_____			
OPV 0	OPV 1			

ASSESS OTHER PROBLEMS:

Circle immunizations needed today.
Return for next immunization on:

(Date)

TREAT

Return for follow up in:

_____

Advise mother when to return immediately.

Give any immunizations needed today:

_____

Counsel the mother about her own health.

Annexure-6: Dosages of drugs used for ARI

Dosage	Dosage	Form	Dose according to body weight (kg)			
			3-<6 kg	6-<10	10-<15	15-<20
Aminophylline for asthma	Loading dose: IV: 5-6 mg/kg (max. 300 mg) slowly over 20-60 minutes	250 mg/10 ml vial	1 ml	1.5 ml	2.5 ml	3.5 ml
	Maintenance dose: IV: 5 mg/kg up to every 6 hours OR by continuous infusion 0.9 mg/kg/hour		1 ml Calculate EXACT dose	1.5 ml	2.5 ml	3.5 ml
Amoxicillin for pneumonia	25 mg/kg two times a day Or 15mg/kg/dose thrice a day	250 mg tablet Syrup (containing 125 mg/5 ml)	½ 5 ml	1 10 ml	1 ½ 15 ml	2 -
Ampicillin	IM/IV: 50 mg/kg every 6 hours	Vial of 500 mg mixed with 2.1 ml sterile water to give 500 mg/2.5 ml	1 ml	2 ml	3 ml	5 ml
Cefotaxime	IM/IV:50 mg/kg every 6 hours	Vial of 500 mg mixed with 2 ml sterile water OR vial of 1 g mixed with 4 ml sterile water OR vial of 2 g mixed with 8 ml sterile water	0.8 ml	1.5 ml	2.5 ml	3.5 ml
Ceftriaxone	IM/IV:50 mg/kg every 12 hours (max single dose 4 g) OR IM/IV:100 mg/kg once daily		2 ml 2 ml	4 ml 8 ml	6 ml 12 ml	9 ml 18 ml

Dosage	Dosage	Form	Dose according to body weight (kg)			
			3-<6 kg	6-<10	10-<15	15-<20
Cloxacillin	IV:25-50 mg/kg every 6 hours IM	Vial of 500 mg mixed with 8 ml sterile water to give 500 mg/10 mls Vial of 250 mg mixed with 1.3 ml sterile water to give 250 mg/1.5 ml	2-(4) ml 0.6 (1.2) ml	4-(8) ml 1 (2) ml	6-(12) ml 1.8 (3.6) ml	8-(16) ml 2.5 (5) ml
Cotrimoxazole* (trimethoprim-sulfamethoxazole TMP-SMX)	4 mg trimethoprim /kg and 20 mg	Oral: paediatric tablet (20mg TMP +100 mg SMX)	1	2	3	3
	sulfamethoxazole/ kg two times per day	Oral: Syrup (40 TMP+200 mg SMX per 5 ml)	2 ml	3.5	6 ml	8.5 ml
	Note: For interstitial pneumonia in children with HIV give 8 mg/kg TMP and 40 mg SMX/ kg 3 times a day for 3 weeks.					
Dexamethasone for viral croup	Oral: 0.6 mg/kg single dose	0.5 mg tablets IM:5 mg/ml	0.5 ml	0.9 ml	1.4 ml	2 ml
Epinephrine (adrenaline) for wheeze For severe viral croup For anaphylaxis	0.01 ml/kg (up to a maximum of 0.3 ml) of 1:10000 solution (or 0.1 ml/kg of 1:10000 solution)given subcutaneously with a 1 ml syringe A trial of 2 ml of 1:10000 nebulized solution 0.01 ml/ kg of 1:1000 solution given subcutaneously with a 1 ml syringe		- -	2 ml 2 ml	2 ml 2 ml	2 ml 2 ml

Dosage	Dosage	Form	Dose according to body weight (kg)			
			3-<6 kg	6-<10	10-<15	15-<20
Erythromycin (estolate)	Oral: 12.5 mg/kg 4 times for 3 days	250 mg tablet	¼	½	1	1
Gentamicin	7.5 mg/kg once per day	IM/IV: vial containing 20 mg (2 ml at 10 mg/ml) undiluted IM/IV: vial containing mg (2ml at 40 mg/ml) mixed with 6 ml sterile water IM/IV: vial containing 80 mg (2 ml at 40 mg/ml undiluted	2.25-3.75 ml 2.25-3.75 ml 0.5-0.9 ml	4.5-6.75 ml 2.25-3.75 ml 0.5-0.9 ml	7.5-10.5 ml 2.25-3.75 ml 2.8-3.5 ml	- -
Benzylpenicillin (penicillinG) general dosage	IV: 50000 units/ kg e very 6 hours	Vial of 600 mg mixed with 9.6 ml sterile water to give 1000000 units/10 ml Vial of 600 mg (1000000 units) Mixed with 1.6 ml sterile water to give 1,000,000 units/2 ml	2 ml 0.4 ml	3 . 7 5 ml 0.75 ml	6 ml 1.2 ml	8.5 ml 1.7 ml
Salbutamol	Oral: 1 mg per dose <1yr 2 mg per dose 1-4 yrs Acute episode 6-8 hrly Inhaler with spacer: 2 doses contains 200 µg Nebulizer: 2.5 mg/dose	Syrup: 2 mg/5 ml Tablets:2 mg Tablets: 4mg Metered dose inhaler containing 200 doses 5 mg/ml solution 2.5 mg in 2.5 ml single dose units	2.5 ml ½ ½	2.5 ml ½ ½	5 ml 1 ½	5 ml 1 ½

Annexure -7: Monitoring Checklist for In-Patients

Date of Admission:				**Inpatient ID No.**					
Child Name:				**Age:**					
Diagnosis:									
	Morning Shift			Afternoon Shift			Night Shift		
	1	2	3	1	2	3	1	2	3
Consciousness level									
Temperature									
Resp. rate									
Pulse rate									
Sp02									
Chest Indrawing-y/n									
Oxygen flow rate									
Checked position of nasal prongs-y/n									
Any leaks in oxygen delivery system-y/n									
Nose cleared if blocked- y/n									
Nasal prongs/ catheter cleaned(at least twice daily)									
Treatment given at the time of shift									
Intake/Feeding • IV Fluids • Breast feeds(no. of times • Other feeds(no. of times)									
Urine Passed									
Remarks									

Notes