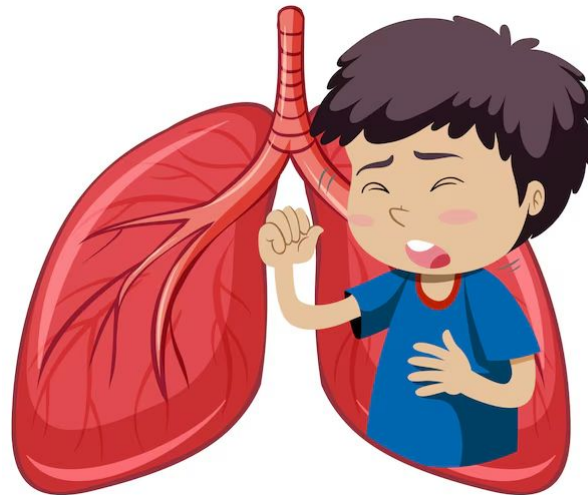


# Pneumonia in Children

Lisa Rynn M.D.

Busitema University

Seed Global Health



# Epidemiology



- Globally 1 child dies of pneumonia every 39 seconds
- 50% of the pneumonia cases and deaths are in Sub-Saharan Africa
- Approximately 80% of all episodes of pneumonia occur in children younger than 8 years
- In Africa pneumonia causes approximately as many child deaths as malaria

# Pneumonia

- Fever, cough, tachypnea, respiratory distress and the finding of abnormal breath sounds on auscultation
- Caused by viruses or bacteria
- Classified as either severe or non-severe based on clinical features



# Pneumonia: Clinical Features

- Respiratory distress
- Fever
- Cough
- Chest pain
- Decreased feeding
- Vomiting
- Abdominal pain
- Wheezing
- Lethargy
- Cyanosis
- Seizure



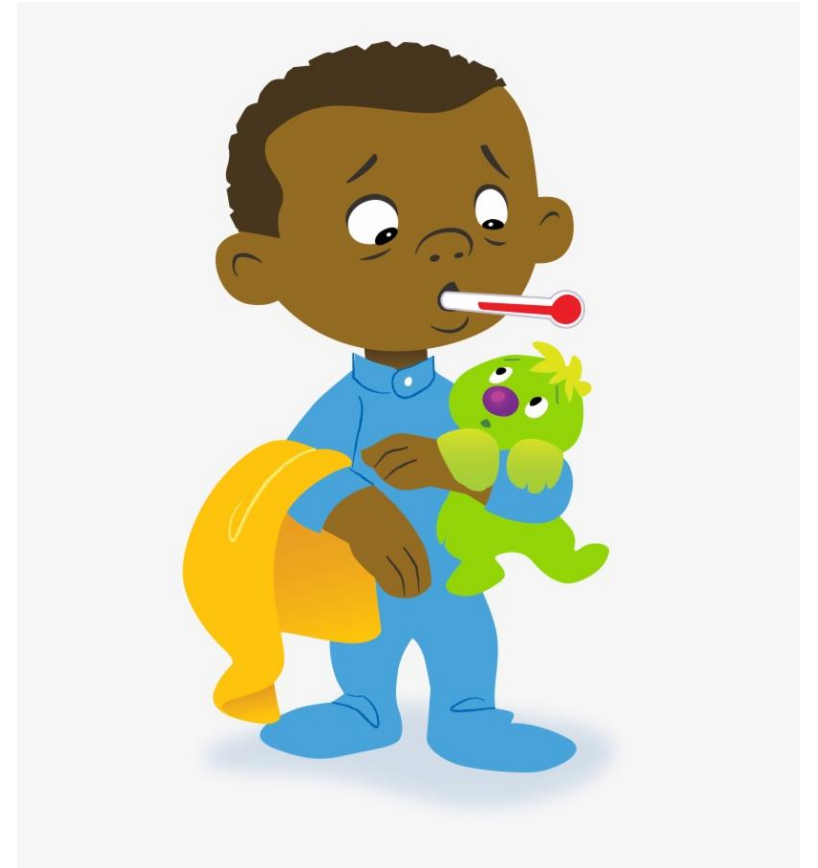
# Signs of Respiratory Distress

- Chest indrawing
- Nasal flaring
- Tripod position
- Grunting respirations
- Cyanosis
- Tachypnea
  - 0 to 2 months  $\geq 60$  breaths per minute
  - 2 to 12 months  $\geq 50$  breaths per minute
  - 1-5 years  $\geq 40$  breaths per minute
  - > 5 years > 30 breaths per minute



# Why children aren't just small adults!

- Obligate nose breathers
- Smaller airways
- More compliant chest wall
- Ribs are oriented more horizontally
- Diaphragm is flatter and less domed
- Less hypoxic drive



Diagnosis	Clinical Features
Pneumonia	<ul style="list-style-type: none"> <li>-Cough with fast breathing and fever</li> <li>-Grunting or difficulty in breathing</li> <li>-Development over days with worsening</li> <li>-Crepitations on auscultation</li> <li>-Signs of consolidation or effusion on chest x-ray</li> </ul>
Asthma	<ul style="list-style-type: none"> <li>-Chronic condition with history of recurrent wheezing</li> <li>-Prolonged expiration</li> <li>-Wheezing or reduced air entry</li> <li>-Response to bronchodilators</li> </ul>
Foreign Body	<ul style="list-style-type: none"> <li>-History of sudden choking</li> <li>-Sudden onset of stridor or respiratory distress</li> <li>-Focal reduced air entry or wheezing</li> </ul>
Retropharyngeal Abscess	<ul style="list-style-type: none"> <li>-Slow development over days with gradual worsening</li> <li>-Inability to swallow</li> <li>-High fever</li> </ul>
Croup	<ul style="list-style-type: none"> <li>-Barking cough and hoarse voice</li> <li>-Associated with upper respiratory tract infection</li> <li>-Stridor on inspiration</li> </ul>

# No Pneumonia

- Signs or Symptoms
  - No signs of pneumonia or severe pneumonia
- Treatment
  - Home care
  - Soothe the throat and relieve cough with safe remedy
  - Advise the mother when to return
  - Follow up after 5 days if not improving





# Pneumonia

- Signs or Symptoms
  - Fever
  - Cough
  - Fast breathing
    - $\geq 50$  breaths/min in a child 2-11 months
    - $\geq 40$  breaths/min in a child aged 1-5 years
  - Chest indrawing



# Severe Pneumonia

- Signs or Symptoms
  - Fever
  - Cough or difficulty in breathing **WITH**
  - Oxygen saturation < 90% or central cyanosis
  - Severe respiratory distress
    - Grunting, severe indrawing
  - Signs of pneumonia with a danger sign
    - Inability to breastfeed
    - Lethargy, reduced level of consciousness

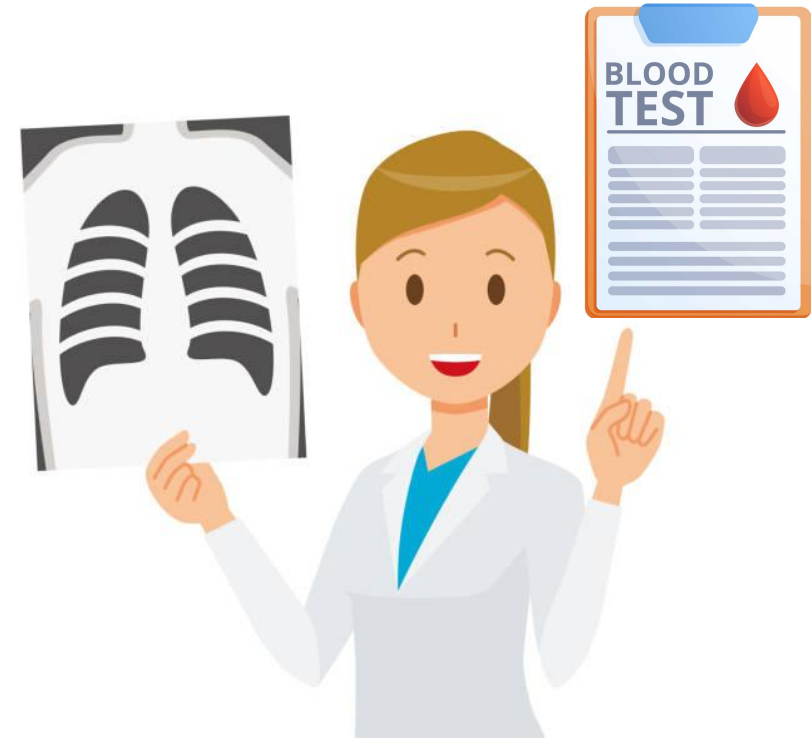


# Common Organisms

Age	Organism
Neonates	Group B streptococcus Klebsiella E. Coli Chlamydia Staph aureus
Children < 5 years	Strep pneumoniae Haemophilus influenzae Staph aureus M. Catarrhalis Mycoplasma pneumonia Viruses (RSV, influenza, measles)
Adults and children > 5 years	Strep pneumoniae Mycoplasma pneumonia Viruses

# Laboratory and Imaging

- MRDT or BS for malaria
- Complete blood count
- Chest X-ray
- **CLINICAL DIAGNOSIS!**



# Management

A- Airway

➡ B- Breathing

➡ C- Circulation

➡ D- Disability

➡ E-Exposure

# Management: Pneumonia

- Treat the child as an outpatient
- Give oral amoxicillin 40 mg/kg per dose twice a day for 5 days
- Instruct the parent how to give medication at home
- Paracetamol 10-15mg/kg every 4-6 hours
- Salbutamol 1-2 puffs every 4-6 hours



# Management: Severe Pneumonia

- Give intravenous ampicillin (or benzylpenicillin) AND gentamicin
  - Ampicillin 50 mg/kg or benzylpenicillin 50,000 U/kg IM or IV every 6 hours for at least 5 days
  - Gentamicin 7.5 mg/kg IM or IV once a day for at least 5 days
- If the child does not show signs of improvement within 48 hours and staphylococcal pneumonia is suspected
  - Gentamicin 7.5 mg/kg IM or IV once daily AND
  - Cloxacillin 50 mg/kg IM or IV every 6 hours
- Use ceftriaxone 80 mg/kg IM or IV once daily in case of failure of first-line treatment



# Management: Severe Pneumonia

- Suction any secretions at the entrance to the nasal passages
- Paracetamol
- If wheeze is present, give bronchodilator and steroids when appropriate
- Encourage breastfeeding and oral fluids
- Ensure that the child receives daily maintenance fluids



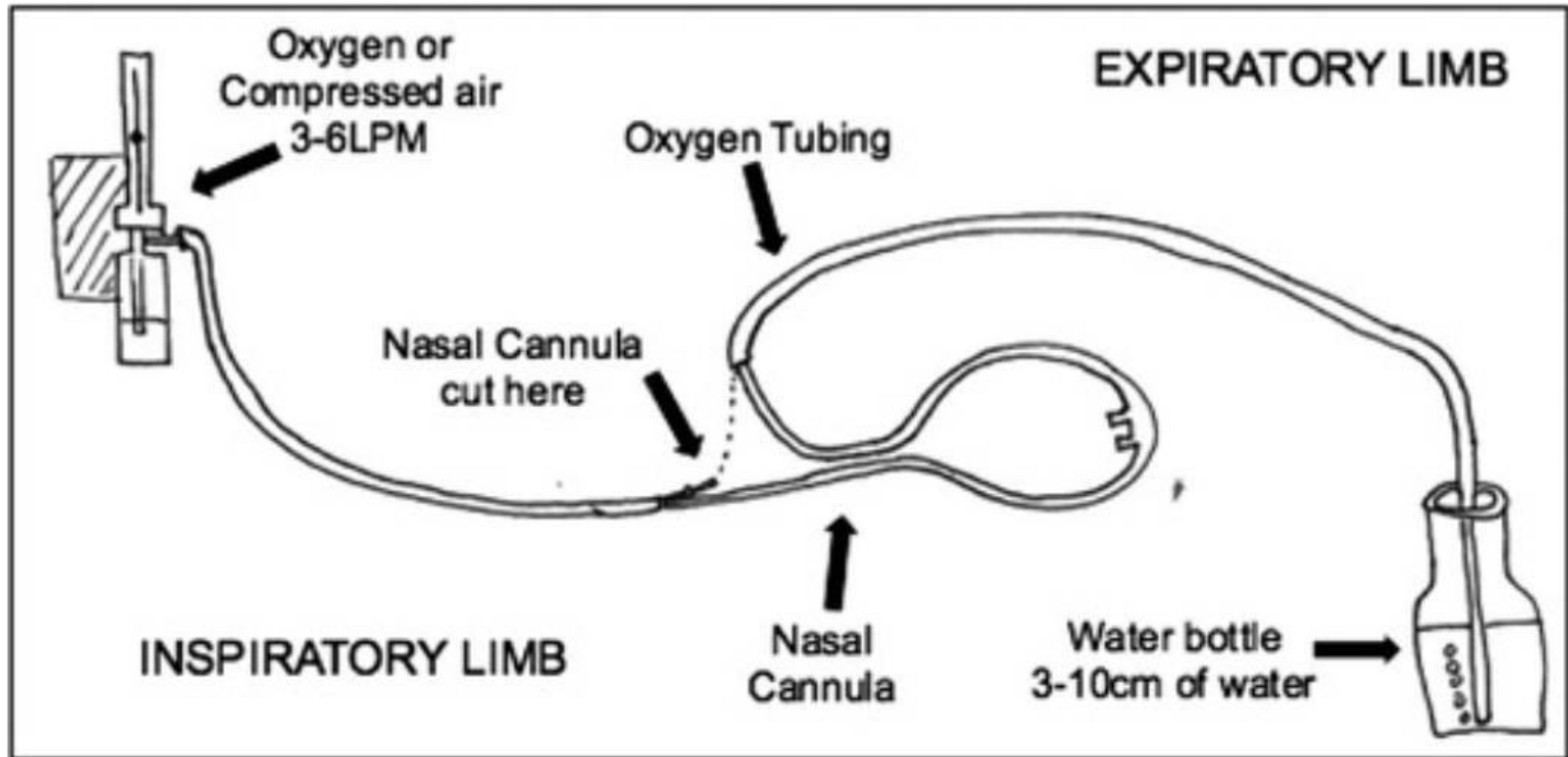


# Supplemental Oxygen

- Nasal canula
  - 0.5 – 1 L/min for neonates
  - 1-2 L/min for infants
  - 1-4 L/min for older children
- Face mask
- CPAP



# How to make bubble CPAP



Classification	Signs or Symptoms	Treatment
No Pneumonia Cough or Cold	<ul style="list-style-type: none"> <li>No signs of pneumonia or severe pneumonia</li> </ul>	<ul style="list-style-type: none"> <li>Home care</li> <li>Soothe the throat and relieve cough with safe remedy</li> <li>Advise the mother when to return</li> <li>Follow up after 5 days if not improving</li> </ul>
Pneumonia	<ul style="list-style-type: none"> <li>Fast breathing               <ul style="list-style-type: none"> <li><math>\geq 50</math> breaths/min in a child 2-11 months</li> <li><math>\geq 40</math> breaths/min in a child aged 1-5 years</li> </ul> </li> <li>Chest indrawing</li> </ul>	<ul style="list-style-type: none"> <li>Home care</li> <li>Give appropriate antibiotic</li> <li>Advise the mother when to return immediately if symptoms of severe pneumonia</li> <li>Follow up after 3 days</li> </ul>
Severe Pneumonia	Cough or difficulty in breathing with <ul style="list-style-type: none"> <li>Oxygen saturation &lt; 90% or central cyanosis</li> <li>Severe respiratory distress               <ul style="list-style-type: none"> <li>Grunting, severe indrawing</li> </ul> </li> <li>Signs of pneumonia with a danger sign               <ul style="list-style-type: none"> <li>inability to breastfeed, lethargy, reduced level of consciousness</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Admit to the hospital</li> <li>Give oxygen if saturation &lt; 90%</li> <li>Manage airway as appropriate</li> <li>Give recommended antibiotic</li> <li>Treat fever if present</li> </ul>

# Complications

- Septicemia
- Pleural effusion and empyema
- Abscess
- Pneumothorax



# Prevention

- Exclusive breastfeeding until 6 months
- Reduce exposure to indoor air pollution
- Good hand hygiene
- Preventing and treating malnutrition
- Encourage vaccines



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**THANK YOU!**