ACUTE RESPIRATORY INFECTION

TERMINOLOGY

- **Stridor** :A harsh noise when the child breaths in ,it occurs when there is narrowing of the larynx, trachea or epiglottis, it can be due to a croup or a foreign body.

  Wheeze: A soft musical noise when the child breaths out ,it may be caused by a swelling and narrowing of the small airways of the lungs or by a contraction of the smooth muscles surrounding the airways in the lung..

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- **An electrolyte panel** - Is a blood test that measures the levels of electrolytes and carbon dioxide in your blood

DEFINITION:-

Acute respiratory infection is an acute infection of any part of the respiratory tract and related structures including parasinuses, middle ear and pleural cavity

ARI means an infection of any part of respiratory tract of less than 30 days duration except otitis media, which is less than 14 days

INCIDENCE:-

Reason For Starting ARI Programme:

Acute respiratory infections are the leading causes of death in Indian children. High mortality is associated with pneumonia. The reasons of high mortality rate:

- Malnutrition
- Delayed recognition
- Difficult access to care &
- Inappropriate management

- Every year 12 million children are dying in developing countries in the first 5 years of life out of which 19% constitute respiratory infection.

- Nearly 25% of OPD patient visits and 15% of all hospital admissions are due to ARI.

RISK FACTORS IN ARI :

1. Lack of immunization.
2. Malnutrition.
3. Vitamin A deficiency.
4. Low birth weight.
5. Young age.
6. Crowding.
7. Cold weather.
8. Exposure to pollution.
9. Inadequate treatment

CAUSATIVE ORGANISM

A number of different organisms have been implicated including

- Streptococcus Pneumonia,
- Haemophilus Influenza,
- Mycoplasma Pneumonaie,
- Influenza, Rhinoviruses,
- Adenoviruses,
- Respiratory Syncytial Virus

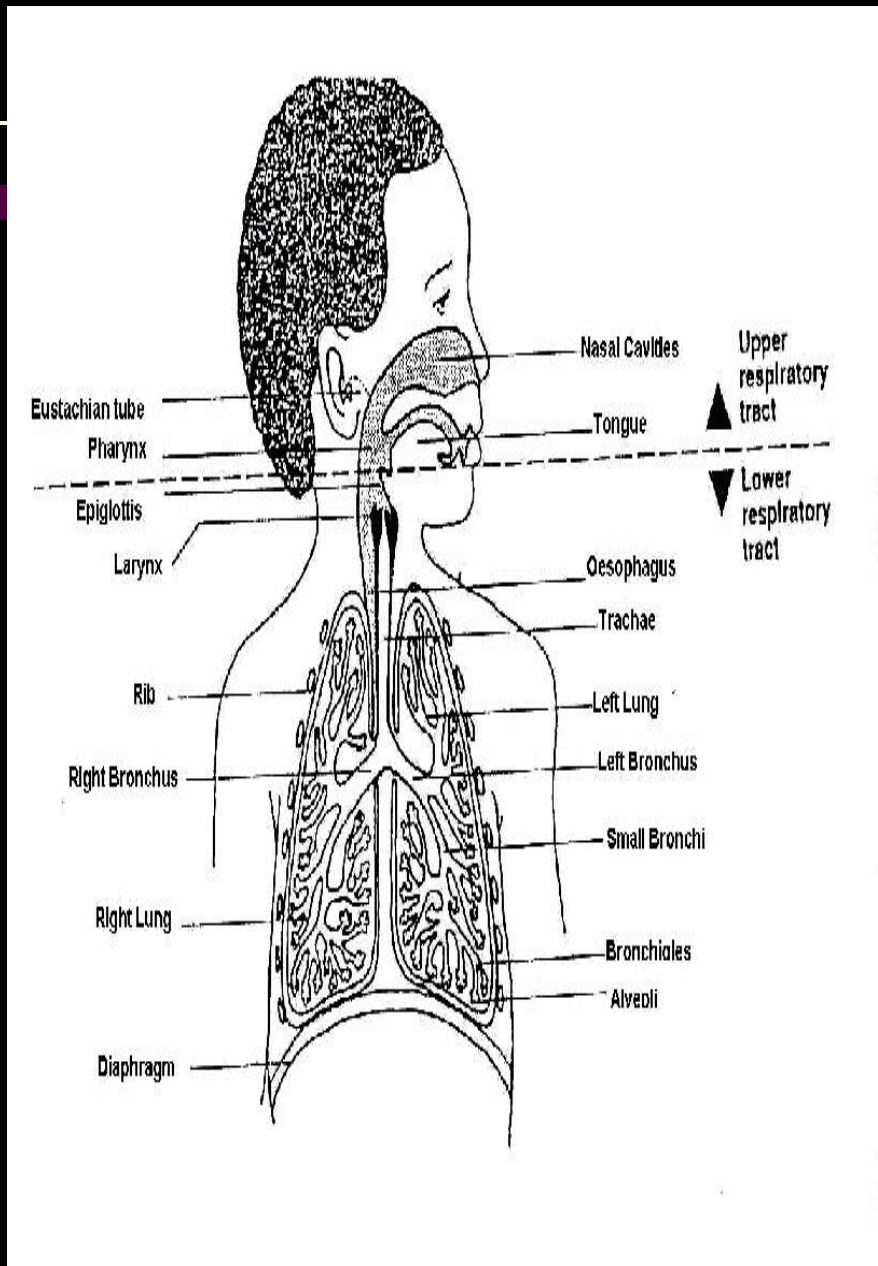
CLASSIFICATION ACUTE RESPIRATORY INFECTION:-

It can broadly divided into –

1. Depending upon the site of infection

a) Acute upper respiratory infection (AURI) includes

- common cold,
- pharyngitis,
- laryngitis,
- epiglottitis
- otitis media,



b) Acute lower respiratory tract infection (ARI) includes

- tracheatitis,
- bronchitis,
- bronchiolitis &
- pneumonia

2. Depending upon the anatomical involvement of the classification include the following

- Bronchopneumonia- patchy involvement of lungs
- Lobar pneumonia- one or more lobes of lungs involved
- Pneumonitis or interstitial pneumonia- alveoli or interstitial tissue between them affected

3. Depending upon the severity of infection, the ARI and pneumonia can be classified as follow s (WHO recommendation)

For children within 2 months to 5 years of age

- No Pneumonia
- Pneumonia (not severe)
- Severe pneumonia
- Very severe disease.

For the infant less than two months of age

- No pneumonia
- Severe pneumonia
- Very severe disease

- **PATHOPHYSIOLOGY**

Respiratory tract infection are those caused by either a virus or bacterium in either the upper or lower respiratory tract

Upper respiratory tract infection affect the trachea and larynx and known as croup or laryngotracheobrochitis.

This infection leads to inflammation and edema of the laryngeal mucosa, followed by epithelial necrosis and shedding.

Narrowing of the subglottic region result in barky cough, harsh voice , stridor and retraction of chest wall.

Edema in these area can lead to asynchronous chest and abdominal movement, fatigue, hypoxia, respiratory failure

- **Lower respiratory tract infections are commonly known as bronchiolitis**

- **Due to etiology**
- **Inflammation of the small bronchi and bronchioles**
- **Edema of the mucous lining the walls of bronchioles**
- **Infiltrates and increased mucus production**
- **Obstruction of bronchioles**
- **hypoxemia**

MODE OF TRANSMISSION

- Age.
- Nutrition
- Socio- economic
- Air pollution
- Climate
- Other infections

INCUBATION PERIOD

- This varies with the organism, but in most cases is 1-3 days

CLINICAL FEATURES

ARI are divided into upper respiratory and lower respiratory

Acute upper respiratory infection

- dry mouth
- inflammation of tonsils, pharynx, and glands
- runny nose
- Sneezing
- headache

Acute bronchitis usually present with

- fever,
- dry cough,
- wheezing and
- mild constitution systems.
- Cough become productive after 5 days

Acute bronchiolities is manifested as severe illness with

- severe dyspnea and prostration.
- Cough is either absent or mild
- mild to moderate fever is usually present
- chest retraction , wheezing, dehydration
- respiratory acidosis
- crepitation and diminish breath sound are detected on ascultation.

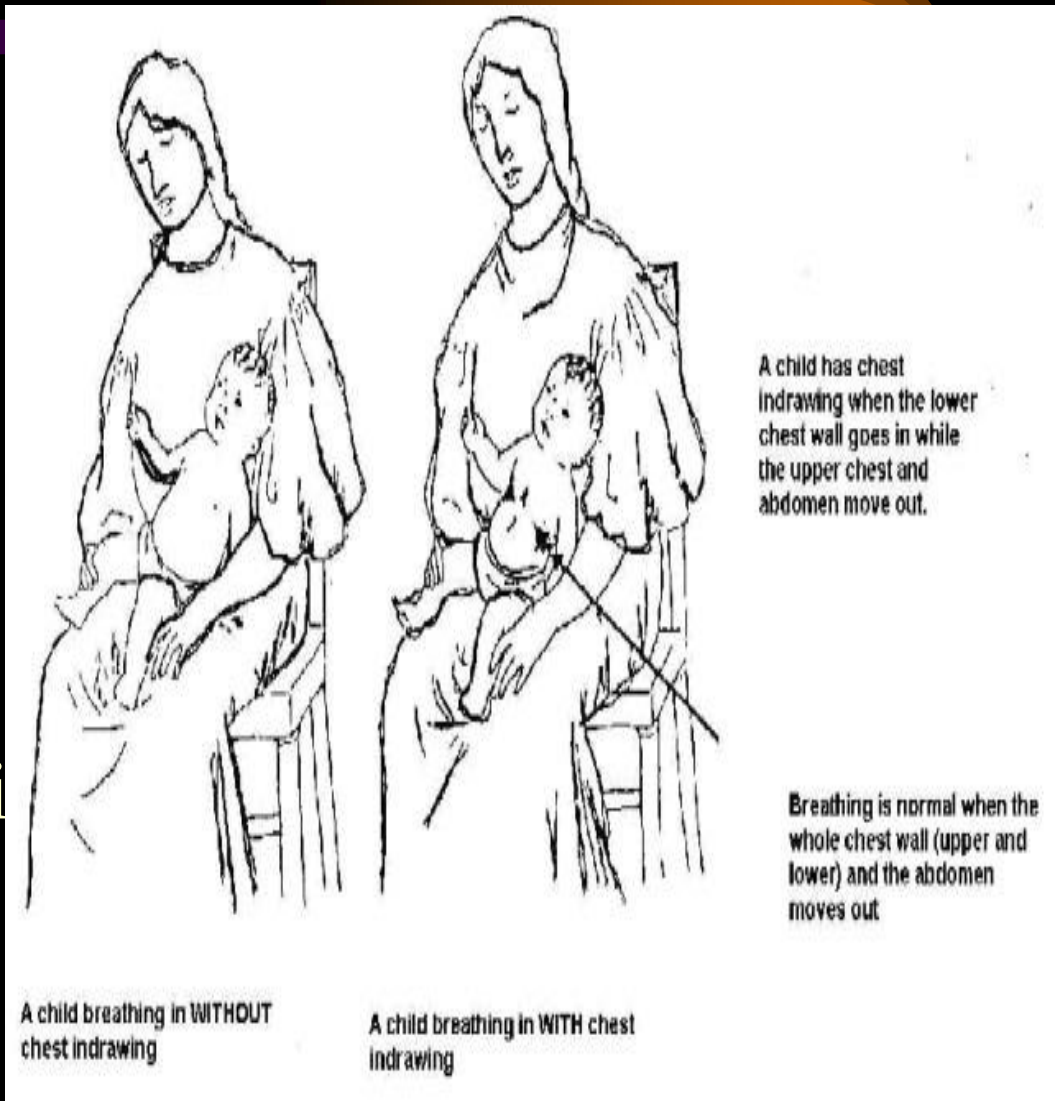
The WHO recommendation, the feature of the lower respiratory infection

- Only cough indicate no pneumonia
- Fast breathing i.e. increased respiratory rate with the presence of cough and cold indicates pneumonia(not severe)
- Fast breathing is diagnosed when the respiratory rate is as follow;
  - 60 or more in a child less than 2 months of age
  - 50 or more in a child of 2-12 months of age
  - 40 or more in a child of 12 months to 5 years

- Chest indrawing with or without fast breathing indicate severe pneumonia

Very severe disease is indicated by the presence of danger like

- Inability to drink
- Excessive drowsiness
- Stridor in calm child,
- Grunting, Wheezing
- Cyanosis
- Fever with hypothermi
- Abdominal distension
- convulsion



DIAGNOSIS

- Detail History Collection
- Physical examination
- X-ray chest is required for the following conditions-
  - ✓ If the patient dose not improved with the initial treatment
  - ✓ Staphylococcus infection
  - ✓ Very severe pneumonia to exclude emphysema and pneumothorax.
  - ✓ Persistence cough more than 30 days
  - ✓ History of foreign body aspiration
  - ✓ To exclude CHF

- Rapid viral diagnostic techniques: enzyme- linked immunosorbent assay or rapid immune fluorescent antibody from direct aspiration, swab, or Sputum culture to identify the organism
- Arterial blood gas value to assess gas exchange
- White blood cell count- normal or mild elevation
- Electrolyte panel- to assess for dehydration

MANAGEMENT

Medical management

- Supportive therapy for mild infections and
- Active administration of antibiotics to the severe case.

In children the respiratory rate and chest indrawing are used to decide management

- **Mild cases** with a respiratory rate of less than 40 breaths/min in children aged 2-12 months and 50 breathe/min in children aged 1-5 years are treated at home with supportive therapy.

- - The mother should encouraged to nurse her child , giving it plenty of fluid

Moderate case with a respiratory rate over 40 breathe/ min inunder1 year olds and 50 breaths/min in children aged 1-5 years, but with no chest indrawing, should be given antibiotics(oral cotrimoxazole 4mg/kg twice daily),

- oral amoxicillin 15mg/kg three times daily)
- or intramuscular penicillin G
- and nursed at home

- **Severe case** with chest indrawing , cyanosis or sick to feed must be admitted as inpatients and given active support as well as treatment with
- antibiotic oxygen therapy,
- antipyretic,
- bronchodilator

NURSING DIAGNOSIS

The common nursing diagnosis are

1) Ineffective airway clearance related to inflammation
2) In effective breathing pattern related to inflammation
3) Fluid volume deficit less than body requirement
4) Imbalance nutrition less than body requirement
5) Fatigue related to increased work of breathing
6) Anxiety related to respiratory distress and hospitalization
7) Parental role conflict related to illness of child
8) Knowledge deficit related treatment regimen
9) Risk for infection related unhygienic practice

NURSING INTERVENTION

- **Nursing diagnosis:**

1. Ineffective airway clearance related to mucous secretion

- **Expected outcome**
- Airway will be maintain and free of secretion

Intervention

- Monitor respiratory status
- Assess vital signs every 2 hours until stable, and then every 2 to 4 hours and as necessary
- Perform cardio respiratory monitoring
- Provide humidity and humidified- oxygen therapy to prevent drying of secretion
- Maintain a clear airway with use of bulb syringe or nasopharyngeal suction catheter
- Administered medications as ordered by physician

2. In effective breathing pattern related to inflammation

- **Expected outcome:**

The child will able to have proper breathing pattern

Intervention

- Assess for and report signs of increased respiratory distress and changes in respiratory status including hypoxia(tachypnea, increased work of breathing, retractions
- Promote respiratory functions
- Monitor oxygen status with pulse oximetery
- Place a semi prone or side lying, avoiding neck hypertension
- Promote opportunities for rest

3. Fluid volume deficit less than body requirement

Expected outcome

Adequate fluid volume and electrolyte will be maintained

Intervention

- Monitor hydration status of the child
- Monitor intake, output and urine specific gravity.
- Monitor weight
- Monitor laboratory values
- Assess for signs of dehydration : dry mucous membranes, decreased skin elasticity, decreased urine output. Increased specific gravity, sunken fontanelle in infant, increased heart rate
- Encourage child to drink prescribed fluid amount if oral fluids are tolerated

4. Imbalance nutrition less than body requirement

Expected outcome;

Optimal caloric intake will be maintain

Intervention

- Obtain nutritional history from primary care giver
- Monitor weight of the child
- Encourage intake of diet high in calories and protein
- Serve favourite foods if possible
- Encourage use of routine feeding practices(feeding times, meals with parents)
- Consult dietician when appropriate
- Encourage exercise as metabolism and utilization of nutrients are enhanced by activity.

5. Fatigue related to increased work of breathing

Expected outcome

- The child will be relieve from fatigue

Intervention

- Promote opportunity for rest
- Encourage coughing and breathing exercise
- Use incentive spirometry to increase lungs expansion
- Limit play activity of the child

- 6. Anxiety related to respiratory distress and hospitalization

Expected outcome

Anxiety will be relieve

Intervention

- Assess level of anxiety
- Reassure child that he or she is safe
- Alleviate or minimize child's and parent's anxiety during hospitalization
- Provide consistent nursing care to promote trust and to alleviate anxiety
- Encourage specific quite play
- Maintain calm and tolerant manner while interacting with the child

7. Parental role conflict related to illness of child

Expected outcome

More effective parenting behaviour will be demonstrated

Intervention

- Assess individual response to child rearing and parental role
- Observe parental stress level
- Encourage expression of feeling
- Encourage acceptance of responsibilities for child
- Provide atmosphere of acceptance

8. Knowledge deficit regarding treatment regimen

Expected Outcome

- The mother will able to gain adequate regarding treatment regimen

Intervention

- Determine understanding of prarent od disease process
- Encourage question
- Provide information to child family in teaching session regarding the need to
- Maintain natural resistance to infection through adequate nutrition, hygiene rest and exercise
- Avoid contact with people with upper respiratory infection
- Explain about supportive and home treatment to care giver
- Planning for discharge from hospitalization and home care,

9. Risk for further infection related unhygienic practice

Intervention

- Assess child for untoward therapeutic response to medications if indicated
- Encourage specific quite play
- Giving tepid sponge to treat fever
- Maintenance of personal hygiene and elimination
- Teach Appropriate handling and disposal of respiratory secretions of respiratory secretions of the infection individuals.

CONTROL AND PREVENTION OF ACUTE RESPIRATORY INFECTION

- Reduce contact
- Good nutrition
- Health education-
- Vaccination of childhood infections
- Advice the mother to give home care

ISSUES FOR IMCI

- Individualized treatment guidelines per country
- Training and supervise first level health worker
- Changing family behaviour regarding care of sick
- Availability and effectiveness of essential drugs

ACTIVITIES FOR ARI CONTROL IN ONGOING MCH PROGRAMMES

- MCH expansion and emphasize breast feeding and maternal nutrition
- Add vit. A to expanded programme of immunization(EPI)

COMPLICATION

- Pulmonary- Atelectasis, apnea, respiratory failure requiring intubation and mechanical ventilation, pneumonia and development of childhood asthma
- Otitis media
- Chronic sinusitis
- Pericardities
- Congestive cardiac failure
- Paralytic eleus
- Weigh loss due to inability to eat and drink owing to increased respiratory effort
- Secondary bacterial infection