Bronchiolitis & Wheezy Infants

1. Bronchiolitis Fundamentals & RSV

- **Definition:** Acute inflammatory injury of the bronchioles, usually viral.
- **Epidemiology:** Most common cause of LRTI in the 1st year of life. Highly contagious (contact/droplets). Seasonal: 93% occurs **Nov - early April**. All kids get RSV by age 2-3.
- **RSV Specifics:** Strain A causes more severe disease. Reinfection is common (no complete immunity). Coinfection with Rhinovirus = extremely severe disease.
- **Risk Factors for Severe Disease:** Age < 3 months, Prematurity/Low Birth Weight, CHD (hemodynamically significant), Chronic Lung Disease (BPD), Immunodeficiency, Parental smoking.

2. Clinical Presentation & Pathophysiology

- **Pathology:** Airway radius decreases to the 4th power -> huge resistance. Debris, edema, and mucus cause obstruction, hyperinflation, atelectasis, and V/Q mismatch.
- **Timeline:** URI symptoms first (congestion, feeding diff). **Peaks around Day 3-4** with LRTI symptoms (cough, wheezing, tachypnea, retractions).
- **MCQ HIGH YIELD:** In infants <6 weeks old, **Apnea** may be the ONLY presenting sign without other features!
- **ICU Risk:** Preterms, apnea, RR >70/min.

> **MCQ TRAP: DIAGNOSTICS (WHAT NOT TO DO)**
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> **Diagnosis is strictly CLINICAL.**
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> - **NO Chest X-Ray:** Leads to misdiagnosing pneumonia. Only do CXR if: focal crackles persist, temp >39°C despite meds, or severe/worsening disease.
> - **NO Routine Labs (CBC/BCx):** SBI is rare. *Exception: 6% of febrile infants <3mo with bronchiolitis have a concurrent UTI, so consider a Urine Culture.
> - **NO ABG/CBG:** Only if severe distress despite O2.

3. Management

- **Supportive Care ONLY:** Oxygen, nasal saline/suction, hydration, antipyretics.
- **Do NOT use:** Routine bronchodilators, Epinephrine, Ribavirin, Antibiotics, or Glucocorticoids.
- **Hypertonic Saline:** Nebulized 3% saline is only for **hospitalized** infants.

4. Prevention: Palivizumab & Vaccines

Palivizumab (RSV Monoclonal Ab) is given monthly (max 5 doses) during RSV season. Indications:

- Preterm **<29 weeks** (if <12 mo at start of season).
- Preterm **<32 weeks** WITH Chronic Lung Disease requiring O2 for 1st 28 days of life.
- Hemodynamically significant **Congenital Heart Disease (CHD)** (<12 mo).
- Age >12 months ONLY IF they have CLD requiring O2, diuretics, or steroids.

> **MEMORY AID: PALIVIZUMAB INDICATIONS**
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> Think **"29 - 32 - Heart"**
> **<29w** gets it automatically (if <1yr). **<32w** has to "earn it" with CLD. **Hearts** get it if significant (<1yr).

New Vaccines (2023): *Nirsevimab* (1 dose for infants <8 mo, or 8-19 mo high risk). *Abrysvo/Arexvy* (Adults >60y, Abrysvo for 3rd trimester pregnancy to protect newborn).

5. Recurrent Wheezing (Tucson Children's Respiratory Study)

33% of kids wheeze before age 3. By age 6, they are grouped into phenotypes:

Phenotype	Characteristics & Prognosis
Transient Early Wheezers (20%)	Wheeze <3 yrs, but STOP by age 6. Associated with **Maternal Smoking** (NOT maternal asthma). Normal IgE. Diminished airway function at birth.
Late-Onset Wheezers (15%)	No wheeze before 3, starts by age 6.
Persistent Wheezers (14%)	Wheeze <3 yrs AND at age 6. Associated with **Maternal Asthma**, high IgE, normal lung function at birth but drops by age 6.

Treatment for Recurrent Wheeze: SABA (albuterol) for acute. Inhaled Corticosteroids (ICS) for persistent/late-onset (not effective for transient). Montelukast is safe for viral wheeze.

6. Asthma Predictive Index (API)

Calculated for children with **≥4 wheezing episodes** (>24h) in past 12 mo (at least 1 physician-confirmed). Positive API requires 1 Major OR 2 Minor criteria.

> **MEMORY AID: API CRITERIA**
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> **Major (The Big 3):** 1. Parent with Asthma | 2. Atopic Dermatitis | 3. Sensitization to Aeroallergens (Dust, pollen, dog/cat).
> **Minor (The Small 3):** 1. Wheezing APART from colds | 2. Eosinophilia ≥4% | 3. Sensitization to Food (Milk, egg, peanut).
>
> *Mnemonic:* Major = **Genetics & Air**. Minor = **Blood, Food & Random Wheeze**.