MEDICAL EDUCATION RESOURCE

Vaccination of Respiratory Infections

? Vaccination of Respiratory Infections ? COMPLETE REVISION

? 1. Tuberculosis (TB)

Vaccine

- **BCG (Bacillus Calmette–Guérin)**

Type

- **Live attenuated vaccine**

Mechanism of Action (MOA)

- Induces **cell-mediated immunity (T-cell response)**
- Prevents **severe forms (meningitis, miliary TB)**

Age Group

- **At birth** (UIP schedule)

Dose & Route

- **0.05 mL (infant), 0.1 mL (older child)**
- **Intradermal (left upper arm)**

Storage / Stability

- Store at **2–8°C**
- **Light-sensitive**
- Reconstituted vaccine ? use within **4–6 hours**

Effectiveness

- Protects against **severe childhood TB**
- Variable efficacy for pulmonary TB

? 2. Diphtheria

Vaccine

- **DPT / Pentavalent vaccine**

Type

- **Toxoid vaccine**

MOA

- Induces **antitoxin antibodies**

- Neutralizes diphtheria toxin

Age Group

- **6, 10, 14 weeks**
- Booster ? **16–24 months, 5 years**

Dose & Route

- **0.5 mL IM**

Storage

- **2–8°C**
- Do NOT freeze

Effectiveness

- Highly effective
- Requires **booster doses**

? 3. Pertussis

Vaccine

- **DPT (whole-cell or acellular)**

Type

- **Killed (whole-cell) / Subunit (acellular)**

MOA

- Induces antibodies against:
  - Pertussis toxin
  - Adhesion factors

Age Group

- Same as Diphtheria (UIP schedule)

Dose & Route

- **0.5 mL IM**

Storage

- **2–8°C**

Effectiveness

- Good protection
- Immunity **wanes over time** ? boosters needed

? 4. Measles

Vaccine

- **Measles / MR / MMR**

Type

- **Live attenuated vaccine**

MOA

- Induces **humoral + cellular immunity**

Age Group

- **9 months** (first dose)
- Booster later

Dose & Route

- **0.5 mL SC**

Storage

- **2–8°C**
- Highly **heat & light sensitive**
- Reconstituted ? use within **4–6 hours**

Effectiveness

- **~95% effective after 1 dose**
- Nearly 100% after booster

? 5. Influenza

Vaccine

- **Influenza vaccine (Trivalent/Quadrivalent)**

Type

- **Killed (inactivated)**

MOA

- Induces antibodies against **hemagglutinin (HA)**

Age Group

- **>6 months of age**
- Annual vaccination

Dose & Route

- **0.5 mL IM**

Storage

- **2–8°C**
- Do NOT freeze

Effectiveness

- Variable (~40–60%)
- Depends on strain match

? 6. COVID-19

Vaccine

- Examples:
    - Covishield
    - Covaxin
    - mRNA vaccines

Type

- **Viral vector / Inactivated / mRNA**

MOA

- Induces antibodies against **spike protein**
- Activates **cellular immunity**

Age Group

- Adults & children (as per guidelines)

Dose & Route

- **0.5 mL IM**

Storage

- **2–8°C (most vaccines)**
- mRNA vaccines may require **ultra-cold storage**

Effectiveness

- Prevents **severe disease & mortality**
- Booster doses required

? 7. Pneumococcal Vaccine

Vaccine

- **PCV (Pneumococcal Conjugate Vaccine)**

Type

- **Conjugate vaccine**

MOA

- Converts **T-independent ? T-dependent response**
- Strong immunity in children

Age Group

- Infants (UIP)

Dose & Route

- **0.5 mL IM**

Storage

- **2–8°C**

Effectiveness

- Prevents:
    - Pneumonia
    - Meningitis

? 8. Rotavirus (Respiratory relevance via child mortality overlap)

Type

- **Live attenuated (oral)**

MOA

- Induces mucosal immunity

Dose

- Oral drops

Storage

- **2–8°C**

? SUPER REVISION TABLE (VERY IMPORTANT)

DISEASE	VACCINE TYPE	ROUTE	AGE	KEY POINT
TB	Live	ID	Birth	Severe TB prevention
Diphtheria	Toxoid	IM	6–14 weeks	Antitoxin
Pertussis	Killed/Subunit	IM	6–14 weeks	Whooping cough
Measles	Live	SC	9 months	Highly contagious
Influenza	Killed	IM	>6 months	Annual vaccine
COVID-19	mRNA/Inactivated	IM	All age groups	Spike protein

DISEASE	VACCINE TYPE	ROUTE	AGE	KEY POINT
Pneumococcal	Conjugate	IM	Infants	Severe infections

? ULTRA HIGH-YIELD EXAM POINTS

- Live vaccines ? **strong immunity, contraindicated in pregnancy**
- Toxoid ? **diphtheria, tetanus**
- Conjugate ? **better in infants**
- BCG ? **ID route (unique)**
- OPV ? **oral (unique)**
- Cold chain ? **2–8°C (universal rule)**