**RESPIRATORY EXAM**

1. **INTORDUCTION AND CONSENT**

* Might be to parents depending on age of the child

1. **ADEQUATE EXPOSURE**

* Correct exposure may be difficult especially if the child is in the parent’s arm
* DO NOT take the child from the parent in the case of a small child
* Best to exam small children in the position that you find them (<7)
* Sitting up is actually ideal
* Tell the patient what you are going to do. Don’t ask patient to ‘do’, you do!
* >7 years can place in anatomical position

1. **INSPECTION**

* Walk from foot of the bed to top of the bed and look/observe
* Affect and state of wellness
* **Supportive therapy** – O2 (how many litres) via facemask, nasal cannula, O2 tanks, IV, wheelchair
* **Nutritional status** – skin and hair changes, muscle (wasting) and fat
  + Must ask for patient’s age, weight, height
  + Appears small for age
* Degree of **Cardio-Respiratory Distress**
  + RR, Flaring Alae Nasi, Subcostal Recession, Intercostal Recession, Use of accessory muscles, Tracheal Tugging
  + Normal respiratory Rates:
    - Neonates <60
    - 1-12 months <50
    - 1-5 years <40
    - 6-8 years<30
    - > 8 years <20
* Comment on noisy respiration if present
  + Wheeze (could suggest cardiac failure), Stridor, Stertor, Cough
* **Type and pattern of breathing** (thoracic, thoracoabdominal or abdominal-mainly)
* Depth of Respiration
* Ask patient to take a deep breath (in older children >8 years) – may have to show them what to do (so do it too). Look for symmetry of chest (must stoop at foot of bed)
  + Compare movement Upper vs. Lower Chest
  + Compare movement Left Side vs. Right
  + Side that moves less, is likely the side with the pathology. Side that looks higher initially but doesn’t move on inspiration may be as a result of hyperinflation as it is unable to accommodate anymore air
* Inspiration (normally x2 longer) vs. Expiration (prolonged – obstruction of small airway 🡪 Asthma and bronchiolitis <2years)
* Kussmaul breathing (deep laboured breathing) = Acidotic
* Look for splinting especially in Sicklers
* Physique- Deformities and proportions and Scars
* Chest wall abnormalities:
  + **Barrel shaped** – Increased AP diameter of the chest Asthma🡪intrathoracic obstruction (alveoli)
  + **Harrison’s Sulcus** (Harrison’s groove) – horizontal grove along the lower border of the thorax corresponding to the costal insertion of the diaphragm.

Intrathoracic obstruction 🡪 large alveoli – compliant chest wall along with a tense diaphragm tugging on the chest wall 🡪 Chronic lung disease of infancy. Look for a depression in the rib cage. May also see in Ricketts as patient lacks the mineralized calcium in their bones necessary to harden them; thus the diaphragm which is always tense pulls the softened none inward

* Dysmorphic features
* Head Shape, Back, Skin-striae (long term corticosteroid use), Tanner Stage, Abnormal movements, Gait, Posture, Wasting, Puffy face (oedema), Joints (MS)

1. **PALPATION**

* Start with peripheries: **Hands** (warm or not)
  + Pallor/Plethora/Pink – capillary refill RED
  + Cyanosis - peripheral cyanosis WHITE
  + Icterus (Jaundice) YELLOW
* Clubbing: loss of the nail bed angle and fluctuance
  + Interstitial fibrosis🡪 cystic fibrosis and bronchiectasis

Don’t have to assess pulses

* Leave eyes, mouth and trachea till last if necessary (may need to do auscultation first with patient in parent’s arms – make use of crying to listen and palpate). If child is cooperative palpate first!
* **Lymph Nodes**
  + Don’t forget epitrochlear, axillary (can leave for last, ensure you say it to consultant)
  + Examine anterior nodes from the back, Posterior nodes from the front
* **Oedema** – not important for OSCE (can asses for cardiac failure)
* **Trachea**
  + Displaced: Fibrosis or collapse pulls trachea to affected side
  + Both trachea and apex beat: Effusion, pneumothorax, mediastinal tumors push away from affected side
* **Apex Beat**
  + Tapping. Thrusting, Normal
  + Normally in left 5th ICS in MCL, attained by age 8 years (starts at age 5 years)
  + Displaced: Cardiomegaly, scoliosis, depression of sternum
* **Chest Expansion**
  + Rest your hand on the chest, don’t hug chest wall, feel movement
  + Assess upper, mid and lower zones
  + Use palms flat on chest to feel movements- thumbs should meet
* **Tactile Vocal Fremitus**
  + Normally should go in the same direction as vocal resonance
  + Younger children may not say ‘99’
  + Can say ‘Joy’ or ‘Paul’
  + Listening for clarity of sound- NOT loudness
* Swellings
* Pain and tenderness

1. **PERCUSSION**

* *MIDDLE FINGER ONLY ON CHEST WALL, LIFT TAPPING FINGER (PLEXOR)*
* When comparing sides decide which side has the pathology
  + Christmas tree pattern at all times comparing signs, ensure this is done in the correct sequence (for auscultation as well)
* **Hyper-resonant** – hyperinflation secondary to asthma and air trapping or a pneumothorax
* **Resonant** – Normal
* **Dull** – due to consolidation from a pneumonia
* **Stony dull** – due to pleural effusion
* Do not have to percuss clavicle in young children as this can be painful (can in older children)

1. **AUSCULTATION**

* **Breath sounds**
  + Caused by turbulence in the upper airway; not total story; some sound generated in lung parenchyma. Therefore it is incorrect to say air entry
  + 2-3cm from midline sounds directly from larynx and bronchi. Therefore listen 2-3cm away form the midline
  + Timing during respiratory cycle
  + Pitch or frequency: high vs. low
  + Intensity or amplitude: loud vs. soft
  + Timbre: harsh, tubular, amphoric vs. rustling

1. **Vesicular** – more alveoli, occurs at age 8 years
   1. Low pitch, soft and rustic - more alveoli acts as a filter for high frequency sounds
   2. Alveoli formed by age 8 years
2. **Bronchovesicular** –in between; normal in children <8 years
3. **Bronchial** – expiratory phase >/= inspiratory phase with a gap in between
   1. High pitched, tubular, loud, tubular or amphoric, similar sound can be heard when you auscultate over the bronchus

* Vesicular with prolonged expiration 🡪 Asthma
* **Vocal Resonance** = clarity of sound NOT loudness
  1. Should go in the same direction as Tactile Vocal Fremitus, if not something is Wrong!
* Whispering Pectoriloqy, Aegophony (a sounds like e) are signs of consolidation
* Added sounds – Wheeze, Crackles (fine or coarse), Pleural Rubs

**Must percuss and auscultate sides (axilla). Always start from Top to Bottom – Christmas Tree pattern**