Respiratory System Examination: The Basics

Major Symptoms (Talley & O Connor pp 100)
Some of the major symptoms that your patient may present include:

- Cough & Sputum, Dyspnoea, Wheeze, Chest Pain (diff^{n} to cardiac)
    - Fever at night, drenching sweating at night, hoarseness, obstructive sleep apnoea, central sleep apnoea (cessation of inspiratory muscle activity).

Respiratory History (Talley & O Connor pp 100)

- Presenting complaint (see above – refer to Talley & O Connor pp 100)
- Treatment: what drugs at present, how often, how much, inhaled/swallowed? Past drug history? Including over the counter drugs?, Cocaine and other drug use?
- Past History: Previous respiratory illness?, abnormalities in chest x ray previously reported to patient?, HIV?
- Occupational History: exposure to dusts (now/previously), asbestos/silica/coal/iron oxide/cotton/silver/NO_2 etc?, exposure to animals (birds, cats etc) → Q fever, exposure to air conditioners/hay/ fumes etc
    - Ask specifically about duration of exposure, if any? Anyone else in family exposed (washing clothes etc), protective devices?
    - Improvement in symptoms over the weekend (clue to occupational cause)
- Social History: smoking history ((cigs/20)*years), passive smoking?, alcohol consumption?, IV drug users?
- Family History: family history of respiratory illness (eg: asthma, TB etc), family history of any major illness?

THE RESPIRATORY EXAMINATION (Talley & O Connor pp 106)

Positioning the patient
If not acutely ill, then patient sitting on edge of bed. 45º angle also helps with JVP. Take your pick.

General Appearance
Watch for the following signs before beginning the examination:

- Dyspnoea at rest:
    - Respiration (not more than 14 bpm)
    - Accessory muscles of respiration used? (SCM, platysma, strap muscles of neck → elevation of shoulders!)
- Cyanosis:
    - central cyanosis (bluish discolouration of tongue): PE, pneumonia, chronic airflow limitation
- Cough:
    - Patient coughs (explosive ↓ → vocal chord paralysis → bovine cough), (wheezy → airflow limitation), productive cough (bronchial secretions → chronic bronchitis, bronchiectasis, pneumonia), dry cough (chest inf., asthma, carcinoma of bronchus, ACE inhibitors).

- Sputum:
    - Volume, type (purulent, mucoid etc), blood?
- Stridor (croaking noise):
    - Obstruction of larynx, trachea or large airways
- Hoarseness:
    - Recurrent laryngeal nerve palsy, laryngeal carcinoma, laryngitis (commonest)

Hands

- Nails → clubbing (loss of angle/rhomboid shape) → HPO (hypertrophic pulmonary arthropathy → tenderness in wrist, metacarpals?
- Staining: tar? (cig smoking)
- Wasting/weakness: small muscles of hand (thenar, hypothenar eminences?) → T1 affected due to lung tumour compressing lower brachial plexus
- Pulse: tachycardia, pulsus paradoxus?
- Flapping tremor (asterixis): severe CO_2 retention → chronic airflow limitation

Face

- Eyes: Horners syndrome (partial ptosis?, constricted pupil?) → lung tumor
- Scleroderma/connective tissue disease: changes in skin texture
- Polyps (tilt head back, asthma!), deviated septum
- Tongue: central cyanosis?
- Pharynx (reddened), enlarged tonsils → upper respiratory tract infection
- Dentition: rotten/broken? → lung abscess or pneumonia
- Sinusitis: tenderness over frontal and maxillary sinuses?
- Facial plethora (excess blood → redness) & cyanosis → SVC obstruction

Trachea (uncomfortable for patient!)

- Fingers lateral to middle finger placed on edges of jugular notch. Middle finger pushed up and backwards until trachea felt.
- Space indicates tracheal displacement: significant displacement → disease of apical lung lobes
- Tracheal tug: inferior movement of trachea during inspiration

Chest (Anterior and Posterior)

- **Inspection:**
  - Shape and symmetry of chest:
    - ↑ AP diameter (hyperinflation → asthma, emphysema)
    - *Pigeon's chest* (localised bowing of sternum and costal cartilages), *pectus excavatum (*depression of lower sternum), *Harrison's sulcus* (sulcus above costal margin)
    - Lesions, scars? (operations, drains), radiotherapy? (erythema, thickened skin over area), swelling of chest wall/neck? (subcut emphysema), prominent veins? (SVC obstruction → alternative pathway)
    - Movement of chest wall: asymmetry, upper lobe expansion (posterior inspection at clavicles), lower lobe expansion (done posteriorly). ↓ movement → pulmonary fibrosis, consolidation, pleural effusion
    - Paradoxical inward motion of abdomen during inspiration → diaphragmatic paralysis
- **Palpation**
  - Chest expansion
    - Hands firmly placed around sides of chest, thumbs opposing, off skin!, symmetrical movement of thumb? (4-5cms)
    - Examine all lobes anteriorly/posteriorly
  - Apex beat:
    - Direction of displacement of apex beat might lead to diagnosis of lesion of that side, cardiac illness?
  - Vocal fremitus:
    - Palpate chest wall → repeat '99' → compare each side of cheat (perform anteriorly and posteriorly).
  - Ribs (optional):

        - Gently compress ribs antero-posteriorly + laterally → ribs fracture etc

- **Percussion**
    - Percuss anterior areas, posterior areas (rotate scapula out of way → move elbow towards front of chest), and lateral areas (midaxillary line).
    - Liver → dull, fluid filled area → extremely dull, normal → resonant, pneumothorax/bowel → hyper-resonant
    - Liver dullness:
        - Percuss along anterior midclavicular line, liver dullness should occur at 5th rib level → if not → hyperinflation of lung (liver pushed down), find liver tip → count cms of liver
    - Cardiac dullness:
        - Area may be decreased in emphysema or asthma

- **Auscultation**
    - Breath sounds (Fig 4.7.2):
        - Listen to following lobes:
            - Anterior: upper, middle (right), upper (left)
            - Posterior: upper, lower (right & left)
            - Right axilla: upper, middle, lower
            - Left axilla: upper, lower
    - Quality of breath sounds:
        - Normal sounds → vesicular breathing, no gap between insp and exp (insp louder)
    - Bronchial breath sounds:
        - Lobar pneumonia (louder on exp than insp, gap present)
    - Intensity of breath sounds:
        - ↓ intensity → chronic airflow limitation?, pleural effusion?, pneumothorax?, pneumonia?, neoplasm?
    - Added (adventitious) sounds:
        - Wheeze?, continuous (insp or exp, pitch of wheeze?) → chronic airflow limitation due to bronchial spasm, excessive secretions, mucosal oedema etc.
        - Crackles? Interrupted sounds. Due to instability in peripheral airways (rapid opening and/or closing). Timing: early → smaller airways, late/pan-inspiratory → alveoli.
    - Pleural friction rub:
        - Continuous/intermittent grating sound due to pleurisy
    - Vocal resonance:
        - Say '99' while auscultating over different parts of chest (anterior/posterior?). normal → muffled, consolidated lung → clearly audible.

Heart

- JVP → right heart failure, pulmonary component of S_2 (2nd left intercostal) → compare to 2nd right intercostal → louder → pulmonary hypertension (cor pulmonale).

Abdomen

- Liver ptosis (displaced?) → emphysema

Other

- Pemberton's sign:

    - Lift both arms → facial plethora, cyanosis, JVP ↑, inspiratory stridor → SVC obstruction
- Feet:
    - Swelling?, cyanosis?, DVT? (→ suggestive of possible PE), clubbing?
- Temperature:
    - Fever → 2nd to chronic chest infection

Beside assessment of lung function

- FE time: exhale forcefully after maximal inspiration (not > 4 secs) → estimation. ↑FET → airway obstruction. Peak flow meter or spirometer will be more accurate.
- Peak flow meter: rapid puff after maximal expiration → PEFR → airway obstruction or asthma.
- Spirometry: FEV_1 measured vs FVC → ratio → FEV_1 / FVC * 100 =80%. < indicates **obstructive defect,** >= indicates **restrictive defect** (both values below normal though!)
- Chest X Ray: consolidation?, pleural effusion?, pneumothorax?, neoplasms?