Tripod Breathing:
Patients with advanced lung disease (in this case COPD) will often assume a tripod position (leaning forward, hands on knees) when breathing difficulties occur. This provides a position that optimizes respiratory mechanics.
1-Introduce yourself
2-Identity of patient – confirm.
3-Permission (consent and explain examination)
4-Expose chest fully after taking a general look.
General look and inspection of respiratory system:

-Patient

Well or unwell?

-Alert or orientated or drowsy and confused?

-Comfortable at rest or in pain?

-Body habitus? Cachectic or obese?

-Signs of respiratory distress:
  -Dyspnoea/ tachypnoea
  -Tripod posture
  -Use of accessory muscles
  -Pursed lip breathing
  -Flared nostrils, intercostal/ subcostal recession, tracheal tug (children)
  -Chest shape
  -Breathing pattern
  -Added breath sounds by inspection? (Stridor, audible wheeze?)
  -Colour? (Pale and shocked or peripherally cyanosed?)
  -Obvious scars
First start with (Hands) - signs of respiratory pathology:

Inspect
Clubbing - perform Shamoroth’s window test and consider respiratory causes:
Abscess of lung
Bronchiectasis
Cancer of the lung / Cystic fibrosis
Empyema
Fibrosis
Cigarette tar staining (not nicotine!)
Peripheral cyanosis
Wasting of small muscles of hand
Especially dorsal interossei and thenar eminence
Can be caused by a C8/T1 lesion e.g. Pancoast’s tumour
Hand signs of rheumatological conditions or steroid use that can have respiratory pathology
Ask if the patient has any pain before you begin (this is a general principle).

Be alert - Young patients – more likely asthma or cystic fibrosis (CF)
Older patients – more likely COPD/interstitial lung disease (ILD)/malignancy

Be alert of treatments or adjuncts around bed – O2 (ILD, COPD) / inhalers or nebulisers (asthma, COPD) / sputum pots (COPD, bronchiectasis)
Be alert - does patient look short of breath? – tripod position / nasal flaring / pursed lips / use of accessory muscles / intercostal muscle recession

Be alert - is the patient able to speak in full sentences?

Be alert - Cyanosis – bluish/purple discolouration – (<85% oxygen saturation)

Be alert chest wall – note any abnormalities or asymmetry – e.g. barrel chest (COPD)

Be alert about cachexia – very thin patient with muscle wasting (malignancy, cystic fibrosis, COPD)
Be alert of cough:
Productive (bronchiectasis / COPD if older / CF if younger)
Dry (asthma if younger / ILD if older)
Wheeze (expiratory) – asthma / COPD / bronchiectasis
.Stridor (inspiratory) – upper airway obstruction
.Be alert that tar staining on fingers (or nicotine patches on body)- smoker – increased risk of COPD / lung cancer
.Clubbing – lung cancer / interstitial lung disease / bronchiectasis
.Peripheral cyanosis – bluish discolouration of nails – O2 saturation <85%
.Features of rheumatological disease (e.g. joint swelling/tenderness) – rheumatological diseases (e.g. rheumatoid arthritis) can be associated with pleural effusions and pulmonary fibrosis
.Skin changes – bruising and thinning of the skin are associated with long-term steroid use (ILD / asthma / COPD)

.Be alert In Assess temperature – ↓ temperature suggests peripheral vasoconstriction / poor perfusion
Palpate pulse – rate and rhythm

Assess respiratory rate – normal adult range = 12-20 breaths per minute

Pulsus paradoxus – pulse wave volume decreases with inspiration – asthma / COPD

Fine tremor – can be a side effect of beta 2 agonist use (e.g. salbutamol)

Flapping tremor – CO2 retention – type 2 respiratory failure – e.g. COPD
Inspect for peripheral cyanosis

. Head and neck
Conjunctival pallor – ask patient to lower an eyelid to allow inspection – anaemia is associated with pallor

. Horner’s syndrome – ptosis / constricted pupil (miosis) / anhidrosis on affected side / enophthalmos

. Central cyanosis – bluish discolouration of the lips / inferior aspect of tongue
Jugular venous pressure (JVP) – a raised JVP may indicate pulmonary hypertension / fluid overload

Ensure the patient is positioned at 45°
Ask patient to turn their head away from you
Observe the neck for the JVP – located inline with the sternocleidomastoid
Measure the JVP – number of centimetres measured vertically from the sternal angle to the upper border of pulsation
jugular venous pressure (JVP)
Inspect for central cyanosis
conjunctival pallor
Inspect for conjunctival pallor

Inspect the mouth
Close inspection of thorax
Scars:
Small mid-axillary scars (e.g. chest drains)
Horizontal postero-lateral scars (thoracotomy from e.g. lobectomy/pneumonectomy)
Skin changes – may indicate recent or previous radiotherapy
- erythema / thickened skin

Deformities – barrel chest (COPD) / pectus excavatum and carinatum
Palpation

Tracheal position:

Ensure patient’s neck musculature is relaxed – chin slightly downwards
Dip index finger into the thorax beside the trachea
Then gently apply side pressure to locate the trachea
Compare this space to the other side of the trachea using the same process
A difference in the amount of space between the sides suggests deviation
The trachea deviates away from pneumothorax and large pleural effusions
The trachea deviates towards lobar collapse and pneumonectomy.
Palpate apex beat:

Normal position is left 5th intercostal space – mid-clavicular line

Right ventricular heave is noted in cor-pulmonale (right heart failure secondary to chronic hypoxic lung diseases such as COPD or ILD)
Chest expansion:
Reduced expansion can be caused by lung collapse / pneumonia

Types of percussion note
Resonant – this is a normal finding

Dullness – this suggests increased tissue density – consolidation / fluid / tumour / collapse

Stony dullness – this suggests the presence of a pleural effusion

Hyper-resonance – the opposite of dullness, suggestive of decreased tissue density – e.g. pneumothorax

Auscultation
Assess quality:

Vesicular (normal)
Bronchial (harsh sounding – similar to auscultating over the trachea – inspiration and expiration are equal and there is a pause between) – associated with consolidation

Assess breathing volume:

Quiet breath sounds suggest reduced air entry – consolidation / collapse / pleural effusion
State reduced breath sounds rather than reduced air entry when presenting
Added sounds:

Wheeze – asthma / COPD
Coarse crackles – pneumonia / bronchiectasis / fluid overload
Fine crackles – pulmonary fibrosis
Types of percussion note
Resonant – this is a normal finding
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Hyper-resonance – the opposite of dullness, suggestive of decreased tissue density – e.g. pneumothorax
Ask patient to sit forwards then palpate for -
Lymph nodes
Palpate the following areas:
Anterior and posterior triangles
Supraclavicular region
Axillary region
Lymphadenopathy may indicate infective/malignant pathology
- lung cancer / tuberculosis / sarcoidosis
Examine the sacrum for oedema (fluid overload in cor pulmonale)

Examine the legs:

Pitting oedema (fluid overload in cor pulmonale)
Assess the calves for signs of deep vein thrombosis
Inspect for evidence of erythema nodosum (associated with sarcoidosis)
Have an idea about English classical teaching:
Chest: anterior
Examine anterior chest as quickly and efficiently as possible as most signs will be best detected on the posterior chest.

Inspect (ask patient to put hands on hips)

Chest wall deformity

Pectus excavatum (‘funnel chest’ e.g. Marfan’s syndrome)
Pectus carinatum (‘pigeon chest’ e.g. severe childhood asthma)
Harrison’s sulcus (severe childhood asthma)
Barrel chest (asthma, COPD)

Breathing pattern

Seesaw breathing (diaphragm in, abdomen out on inspiration; severe airway obstruction)
Fail chest/ paradoxical breathing (fracture of 2 or more ribs anteriorly and posteriorly)
Kussmaul breathing (DKA)
Cheynes-Stokes/periodic breathing (comatose patient)

Missing ribs
Scars
Thoracotomy – pneumonectomy or lobectomy
Thoracoplasty – rib removal (commonly old TB)
Small scars in axillae (previous chest drains)
Radiotherapy tattoos
Palpate
Apex beat (may be impalpable in COPD, pleural effusion)
RV heave (cor pulmonale)
Expansion:
Lateral: symmetry, >5cm increase...!
AP: symmetry
Percuss
Auscultate
Same places as percussion
Vocal resonance
If an area of dullness is found, vocal resonance can be used to distinguish between consolidation (increased) and effusion (decreased).
It is not necessary to also perform tactile vocal fremitus, but it is important to be aware of them.
Chest: posterior

It is often easier to detect pathology when examining the posterior chest so be thorough!
Inspect again
Scars
Radiotherapy tattoos
Deformity – particularly kyphosis or scoliosis
Breathing pattern
Palpate
Expansion- repeat lateral expansion
Lymph nodes
Cervical
Supraclavicular
Sacral oedema (cor pulmonale)
Percuss
Percuss the upper, middle and lower zones
Auscultate
Same as percussion
Vocal resonance
Short notes on classical English teaching:
CVS summary exam:
General Inspection:
Surroundings
Monitoring
pulse oximeter
ECG monitoring
Daily weights/ fluid restriction chart
Treatments
Oxygen therapy: type (e.g. venturi) and rate (e.g. 25% or 5L) of delivery
GTN spray
Warfarin INR card
Insulin pen
IV infusions
Wheelchair, walking aids
Cigarettes, nicotine patches.
Patient
General look-
Well or unwell; short of breath; alert and orientated or drowsy and confused; comfortable at rest or in pain?
Syndromic features (e.g. Down’s or Marfanoid)
Colour
  Pale (anaemia); malar flush (mitral stenosis); cyanosis (low sats – consider lung disease and cor pulmonale).
Systemic examination

Chest
Inspect
Scars
Lateral thoracotomy (mitral valve)
Midline sternotomy (CABG or valve)
Left subclavicular (pacemaker, AED)
Back (coarctation or ballic-torso shunt)
Deformity (e.g. pectus escavatum in Marfan’s syndrome)
Pacemaker or AED
Ticking of metallic heart valve? (stop to think about this or you may miss it)
Face
Inspect
Malar flush (mitral stenosis)
Eyes:
Corneal arcus (elderly, hyperlipidaemia in young)
Conjunctival pallor (anaemia)
Petechial haemorrhages (endocarditis)
Xanthelasma (hyperlipidaemia)
Mouth
Hydration status
Dentition (risk of endocarditis)
Central cyanosis (under tongue)
High-arched palate (Marfan’s syndrome)
Neck
Inspect and palpate
Carotid pulse (character and volume)
Collapsing: aortic regurgitation
Slow-rising: aortic stenosis
Thready: shock
Bounding: CO2 retention
JVP can be differentiated from carotid by:
Hepatojugular reflux; occludable; not pulsatile; double waveform
JVP is raised if vertical height is >3cm above sternal notch
.Auscultate
Carotid bruits
Arms
Inspect
Scars from forearm vein harvesting
IV access
Track marks (IV drug use is an endocarditis risk factor)
Bruising
Anticoagulation therapy
Palpate
Offer to measure BP
Pulse pressure
Narrow (aortic stenosis)
Wide (aortic regurgitation)
Unequal arm BPs
Aortic dissection
Subclavian artery stenosis: BP reduced on side of stenosis
Hands
Inspect
Temperature
Capillary refill (at level of heart)
Colour (peripheral cyanosis)
Clubbing – perform Shamroth’s window test and consider cardiac causes
Congenital cyanotic heart disease; endocarditis; atrial myxoma
Cigarette tar staining (not nicotine!)
Tendon xanthomata (hyperlipidaemia)
Janeway lesions (endocarditis)
Osler nodes (endocarditis)
Splinter haemorrhages
trauma, vasculitis, endocarditis
Pale palmar creases (anaemia)
Palmar erythema
Hyperthyroidism; pregnancy, polycythaemia
Arachnodactyly (Marfan’s syndrome)
Quincke’s sign (aortic regurgitation)
Palpate:
Radial pulse (rate, rhythm)
Weak left pulse post-Fontan procedure
Radio-radial delay
Aortic dissection
Aortic coarctation (delayed on left depending on level of coarctation)
Subclavian artery stenosis
Radio-femoral delay
Aortic coarctation
Collapsing pulse (aortic regurgitation)
Ask about pain in shoulder first
Palpate
Apex beat
Normal: 5th intercostal space, mid-clavicular line
Forceful: LVH, aortic stenosis
Heaving/thrusting: cardiomegaly (chamber/s enlargement or ventricular hypertrophy)
Tapping: mitral stenosis
Double: HOCM
LV and RV heave (ventricular hypertrophy)
Thrills (palpable murmur)
Auscultate
Listen to heart sounds in four areas with diaphragm whilst feeling carotid pulse
If a systolic murmur is heard.
Listen in the axilla for radiation (mitral regurgitation)
Listen over the carotids for radiation (aortic stenosis)
Always perform the reinforcement manoeuvres to detect diastolic murmurs:
Bell on apex, roll on left side, hold breath in expiration (mitral stenosis)
Sit forwards, left lower sternal edge with diaphragm, hold breath in expiration (aortic regurgitation)
With patient sat forward, auscultate lung bases
Reduced air entry, bilateral crepitations (pulmonary oedema)
Sacrum
Sacral oedema (heart failure, fluid overload)
Legs
Check for pain in ankles first
If present find upper limit of peripheral oedema and feel for pulsatile liver (tricuspid regurgitation)
Scars (medial calf for saphenous vein harvesting in CABG)
Peripheral oedema (heart failure, fluid overload)
Closure in CVS exam:

Thank patient
Patient comfortable?
Help getting dressed?
Wash hands
Turn to examiner, hands behind back, holding stethoscope (try not to fidget! يتمنمل) before saying: “To complete my examination, I would like to…”

Further examinations:
Perform a peripheral arterial examination
Perform fundoscopy (hypertensive retinopathy, Roth spots in endocarditis)
Bedside investigations:
Obs: resp rate, pulse, BP, O2 sats, temperature
Measure lying and standing BP
12-lead ECG
Urine dip
Blood glucose
Further investigations
Bloods: consider BNP (heart failure) and troponin (ischaemia or myocarditis)
Echo
Closure in respiratory system exam:

Thank patient
Patient comfortable?
Help getting dressed?
Turn to examiner, hands behind back, holding stethoscope (try not to fidget!) before saying: “To complete my examination, I would like to…”

Bedside investigations:
Look at obs chart and repeat set of obs (pulse, BP, SATs, temp.)
Measure peak flow
Inspect any sputum pots and send for MCS
Further investigations as needed:
Bloods
Lung function tests
CXR