

# Differential Diagnosis of Acute Shortness of Breath

Cause grouping	Differentials	Classical history	Classic examination findings	Investigation findings (Initial test, diagnostic test)	Definitive management (remember ABCDE first)
Respiratory	Pulmonary embolism	<ul style="list-style-type: none"> <li>•Pleuritic chest pain</li> <li>•Haemoptysis &amp; SOB</li> <li>•Risk factors (long haul flight, recent surgery, immobility)</li> </ul>	<ul style="list-style-type: none"> <li>•CVS: tachycardia, JVP distension, RV heave, loud P2, right S4</li> <li>•RS: tachypnoea, clear chest</li> <li>•CALVES: look for DVT</li> <li>•SBP&lt;90/pulselessness/persistent bradycardia = "massive PE"</li> </ul>	<ul style="list-style-type: none"> <li>•<u>D-Dimer</u> (if low Wells score): raised</li> <li>•<u>CT pulmonary angiogram</u></li> <li>•ECG: tachycardia, RV strain (T wave inversion in right chest and inferior leads), RBBB, right axis deviation, S1Q3T3 pattern rare</li> <li>•ABG: hypoxia, hypocapnia</li> <li>•CXR: may be wedge opacity, regional oligoemia, enlarged pulmonary artery, effusion</li> </ul>	<ul style="list-style-type: none"> <li>•Treatment dose LMWH</li> <li>•Thrombolysis if massive PE</li> </ul>
	Pneumonia	<ul style="list-style-type: none"> <li>•Fever</li> <li>•Shortness of breath</li> <li>•Productive cough</li> <li>•Pleuritic chest pain</li> <li>•Confusion</li> </ul>	<ul style="list-style-type: none"> <li>•Tachypnoea, cyanosis</li> <li>•Coarse crepitations and bronchial breathing</li> <li>•Dullness to percussion</li> <li>•Increased vocal resonance/tactile vocal fremitus</li> </ul>	<ul style="list-style-type: none"> <li>•<u>CXR</u>: consolidation, air bronchogram</li> <li>•Inflammatory markers: raised</li> <li>•<u>Identify cause</u></li> <li>•Sputum culture</li> <li>•Urinary pneumococcal and legionella antigens</li> <li>•Blood culture</li> </ul>	<ul style="list-style-type: none"> <li>•Antibiotics</li> </ul>
	Pneumothorax	<ul style="list-style-type: none"> <li>•Sudden onset pleuritic chest pain</li> <li>•May be SOB if large</li> <li>•Risk factors e.g. Marfan's appearance, COPD/asthma</li> </ul>	<ul style="list-style-type: none"> <li>•<u>Ipsilateral</u></li> <li>•Reduced chest expansion</li> <li>•Absent breath sounds</li> <li>•Hyperresonance</li> <li>•<u>Tension pneumothorax</u></li> <li>•JVP distension, hypotension</li> <li>•Tracheal deviation (away from affected side)</li> </ul>	<ul style="list-style-type: none"> <li>•<u>CXR</u>: air in pleural space</li> </ul>	<ul style="list-style-type: none"> <li>•<u>Primary</u></li> <li>•&lt;2cm → CXR monitoring</li> <li>•&gt;2cm or Sx → aspirate</li> <li>•<u>Secondary</u></li> <li>•&lt;1cm → observe for 24h</li> <li>•1-2cm → aspirate</li> <li>•&gt;2cm or Sx → chest drain</li> </ul>
	Asthma exacerbation	<ul style="list-style-type: none"> <li>•Dyspnoea</li> <li>•Wheeze</li> <li>•Asthmatic</li> </ul>	<ul style="list-style-type: none"> <li>•Cyanosis, tachypnoea</li> <li>•Use of accessory muscles</li> <li>•Polyphonic wheeze</li> <li>•Reduced air entry</li> <li>•Reduced PEFR</li> </ul>	<ul style="list-style-type: none"> <li>•<u>Clinical diagnosis</u></li> <li>•CXR: exclude infection and pneumothorax</li> <li>•ABG: usually normal P<sub>a</sub>O<sub>2</sub> and low P<sub>a</sub>CO<sub>2</sub> (hyperventilation), if ↓ P<sub>a</sub>O<sub>2</sub> or ↑ P<sub>a</sub>CO<sub>2</sub>, patient is tiring</li> <li>•Blood and sputum cultures if evidence of infection</li> </ul>	<ul style="list-style-type: none"> <li>•Salbutamol nebs</li> <li>•Ipratropium nebs</li> <li>•Steroids</li> <li>•Magnesium IV</li> <li>•Antibiotics if evidence of infection</li> </ul>
	COPD exacerbation	<ul style="list-style-type: none"> <li>•Dyspnoea</li> <li>•Wheeze</li> <li>•Change in sputum</li> <li>•Known COPD or lifelong smoker</li> </ul>	<ul style="list-style-type: none"> <li>•Cyanosis, tachypnoea</li> <li>•Use of accessory muscles</li> <li>•Polyphonic wheeze</li> <li>•Reduced air entry</li> </ul>	<ul style="list-style-type: none"> <li>•<u>Clinical diagnosis</u></li> <li>•CXR: exclude infection and pneumothorax</li> <li>•ABG: hypoxia, hypercapnoea</li> </ul>	<ul style="list-style-type: none"> <li>•Salbutamol nebs</li> <li>•Ipratropium nebs</li> <li>•Steroids</li> <li>•Antibiotics</li> <li>•BiPAP if required</li> </ul>
	<b>Other respiratory differentials</b>	Extrinsic allergic alveolitis; laryngitis; bronchitis; pneumonitis; bronchiectasis; LRTI			

Cardiac	ACS	<ul style="list-style-type: none"> <li>•Crushing central chest pain</li> <li>•Radiates to neck/left arm</li> <li>•Associated nausea/SOB/sweatiness</li> <li>•Cardiovascular risk factors</li> </ul>	<ul style="list-style-type: none"> <li>•May be normal</li> <li>•General: sweaty, SOB, in pain</li> <li>•CVS: S4 gallop, JVP distension, signs of heart failure, brady/tachycardic</li> </ul>	<ul style="list-style-type: none"> <li>•ECG: ST elevation (or new LBBB), inverted T waves, Q waves</li> <li>•Troponin: increased (but normal in unstable angina)</li> <li>•CXR: normal or signs of heart failure</li> <li>•<u>Coronary angiography</u></li> </ul>	<ul style="list-style-type: none"> <li>•MONAC</li> <li>•Primary coronary intervention</li> </ul>
	Acute LVF	<ul style="list-style-type: none"> <li>•SOB, orthopnoea, PND</li> <li>•Pink frothy sputum</li> <li>•Peripheral oedema</li> <li>•Cardiac history</li> </ul>	<ul style="list-style-type: none"> <li>•Tachycardia, tachypnoea</li> <li>•Raised JVP</li> <li>•Fine bi-basal crepitations</li> <li>•S3 gallop rhythm</li> <li>•Peripheral oedema</li> </ul>	<ul style="list-style-type: none"> <li>•CXR: Alveolar shadowing, B – lines, Cardiomegaly, Diversion of blood to upper lobe, Effusion</li> <li>•<u>Echocardiogram</u></li> <li>•BNP</li> <li>•ECG: look for MI</li> </ul>	<ul style="list-style-type: none"> <li>•Furosemide</li> <li>•GTN infusion</li> <li>•CPAP if required</li> <li>•Treat cause (if any)</li> </ul>
	<b>Other cardiac differentials</b>	Cardiomyopathy; myocarditis; acute valvular disease; pulmonary hypertension			

Other	Hyperventilation in anxiety	<ul style="list-style-type: none"> <li>•Tight chest pain, SOB, sweating, dizziness, palpitations, feeling of impending doom</li> <li>•Anxious personality &amp; other symptoms of generalised anxiety disorder</li> <li>•Recurrent episodes triggered by a stimulus (e.g. crowds)</li> </ul>	<ul style="list-style-type: none"> <li>•Usually normal</li> <li>•Hyperventilation</li> </ul>	<ul style="list-style-type: none"> <li>•<u>Clinical diagnosis</u></li> <li>•ECG: exclude MI</li> <li>•Troponin: exclude MI</li> <li>•CXR: exclude infection</li> <li>•ABG: respiratory alkalosis</li> </ul>	<ul style="list-style-type: none"> <li>•Reassurance</li> <li>•CBT</li> </ul>
	<b>Other differentials</b>	DKA; overdoses; metabolic acidosis; sepsis/SIRS; foreign body; anaphylaxis			