Respiratory System History and Examination

History
Respiratory problems may be caused by disorders of other symptoms and so it may be appropriate to refer also to the separate Cardiovascular History and Examination and Ear, Nose and Throat Examination articles.

History of presenting complaint
The main respiratory symptoms are:

- Dyspnoea (see the separate Breathlessness article).
- Cough and sputum (see the separate Chronic Persistent Cough in Adults and Chronic Cough in Children articles).
- Haemoptysis.
- Chest pain.
- Wheeze (see the separate Bronchial Asthma and Wheezing in Children articles). NB: severe asthma may cause a silent chest with no wheeze.

Other systems
- Loss of appetite is a common feature whenever people are unwell. It suggests that the disease is having a significant effect on well-being.
- Significant loss of weight may well be indicative of serious illness - eg, malignancy or tuberculosis.
- Upper gastrointestinal symptoms: gastro-oesophageal reflux is a common cause of chronic cough.
- Heart disease may cause respiratory symptoms. Establish whether there are any indications of heart failure or coronary heart disease.
- Severe anaemia may cause breathlessness.
- Rheumatoid arthritis and other connective tissue diseases may cause respiratory symptoms.
- Neuromuscular diseases may cause respiratory symptoms, particularly dyspnoea.

Past medical history
- Use of inhalers (assess compliance and technique).
- Use of steroids (some measure of severity in asthma).
- Other drugs which may have relevance in respiratory disease - eg, angiotensin-converting enzyme (ACE) inhibitors (cough).

Allergies
Ask about all allergies including, for example, food, inhaled allergens and drugs.

Occupational and social history
- An occupational history may be very important in respiratory disease. See the separate Occupational Asthma, Industrial Dust Diseases, Asbestos-related Diseases, Extrinsic Allergic Alveolitis and Sick Building Syndrome articles.
- Hobbies and pets may also be responsible for respiratory disease (refer to the article on extrinsic allergic alveolitis).
- Lifestyle and alcohol consumption are also very relevant to respiratory diseases. Ask about illicit drugs.
- Smoking history should detail, for example, the type and number of cigarettes smoked currently and in the past. Ask also about passive smoking.
- Sexual history may be relevant to risk of HIV and AIDS.

Family history
- Respiratory diseases with a genetic component - eg, cystic fibrosis, emphysema (alpha-1-antitrypsin deficiency).
- Infectious diseases such as tuberculosis (remember high-risk groups).
- Atopic diseases such as asthma, hay fever and eczema.

Examination
Inspection
- General inspection:
  - Evidence of respiratory distress at rest or when walking - eg, obvious breathlessness, talking in short phrases rather than full sentences, use of accessory muscles, exhalation with pursed lips.
  - Evidence of other respiratory symptoms - eg, cough, audible wheeze.
  - Note whether the patient appears to be pyrexial (check their temperature).
  - Note whether there are any indicators of recent weight loss - eg, sunken cheeks.
Hands:
- Finger clubbing.
- Cyanosis.
- Tobacco staining.
- Radial pulse: tachycardia suggests significant respiratory difficulty or marked overuse of a beta agonist. Lung cancer can cause atrial fibrillation. A large pneumothorax or a tension pneumothorax can cause pulsus paradoxus.
- A tremor may indicate carbon dioxide retention.
- Hypertrophic pulmonary osteoarthropathy.

Face:
- General appearance - eg, Cushingoid as a result of long-term use of steroids.
- Central cyanosis.
- Anaemia (conjunctivae).
- Horner's syndrome (possible apical lung cancer).

Neck:
- Jugular venous pressure - eg, cor pulmonale.
- Goitre (any possible tracheal obstruction).
- Lymphadenopathy.
- Evidence of superior vena cava obstruction (may be caused by lung cancer).

Chest:
- Chest shape:
  - Overinflated (may indicate chronic obstructive pulmonary disease or severe acute asthma).
  - Asymmetry (the abnormality is on the side that moves less - eg, pneumothorax, collapse, consolidation or effusion).
  - Other abnormalities include pigeon chest (pectus carinatum), funnel chest (pectus excavatum), kyphosis and/or scoliosis (see the separate Chest Deformity article).
- Respiratory rate (normal for an adult is about 14/minute).
- Note any indication of respiratory distress.
- Nature of breathing, including:
  - Kussmaul's breathing: deep and laboured breathing, often associated with severe metabolic acidosis.
  - Cheyne-Stokes' breathing: progressively deeper breathing followed by temporary apnoea, which may occur with heart failure, cerebrovascular disease, head injury, carbon monoxide poisoning or brain tumours, or be a normal variant during sleep or at high altitude.
- Operation scars.
- Paradoxical chest movement may indicate a fractured rib.

Abdomen and lower limbs:
- Hepatomegaly may indicate right heart failure.
- Swollen calf (possible deep vein thrombosis).
- Peripheral oedema may be noted (lower legs if ambulant or sacral if bed-bound).

Palpation
- Use the index finger to feel the trachea and to determine whether the trachea feels central or is deviated:
  - The trachea is deviated away from pneumothorax and effusion and towards collapse and consolidation.
  - The trachea may also be deviated by a mass - eg, enlarged lymph nodes.
- Chest expansion:
  - Usual chest expansion in an adult is 4-5 cm and should be symmetrical.
  - Symmetrical reduction: overinflated lungs (eg, bronchial asthma, emphysema), stiff lungs (eg, pulmonary fibrosis), ankylosing spondylitis.
  - Asymmetrical reduction of chest wall expansion: absent expansion (eg, empyema and pleural effusion) or reduced expansion (eg, pulmonary consolidation and collapse).
- Tactile vocal fremitus:
  - To assess tactile vocal fremitus, use the ulnar side of the hand, by the hypothenar eminence with the palms facing upwards. Place it at various levels over the back, each time asking the patient to say "ninety-nine". Note how the sound is transmitted to the hand.
  - Tactile vocal fremitus is increased over areas of consolidation and decreased or absent over areas of effusion or collapse.
- Feel for the apex beat of the heart; it will be displaced if the mediastinum is displaced or distorted.

Percussion
- For percussion of the chest, it is usual to use the middle finger of the dominant hand to do this.
- The clavicle is percussed directly, usually about a third of the way between the sternum and the acromium. The rest of the chest is percussed by placing the non-dominant hand on the chest and using the dominant middle finger to tap the other middle finger over the middle phalanx.
• Percuss over all the lobes of the lung, front and back except that the middle lobe does not have surface anatomy on the back.
• Percuss over the heart. In hyperinflation of the chest, there is loss of cardiac dullness.
• A hyper-resonant sound suggests hyperinflation or a pneumothorax.
• A dull sound is easier to distinguish from normal. It may suggest collapse or consolidation, or a pleural effusion.

Auscultation

• Heart auscultation mainly to detect heart abnormalities but severe lung disease may cause pulmonary hypertension and a loud P2. See the separate Heart Auscultation article.
• Place the stethoscope over each of the five lobes of the lungs in turn, on the front and back of the chest. Ask the patient to take deep breaths in and out with their mouth open.
• Normal breath sounds are called vesicular. They are described as quiet and gentle. There is usually no gap between the inspiratory and expiratory phase sounds.
• Rhonchi (wheezes):
  • Musical sound heard on expiration. In severe cases they may be both inspiratory and expiratory. Implies narrowing of the airways.
  • The loudness of rhonchi gives no indication of the severity of the condition.
• Rales (sometimes called crackles):
  • Probably represent opening of small airways and alveoli.
  • They may be normal at the lung bases if they clear on coughing or after taking a few deep breaths.
  • Basal rales are a classical feature of pulmonary congestion with left ventricular failure. They may be more diffuse in pulmonary fibrosis.
• Bronchial breathing:
  • The sounds of bronchial breathing are generated by turbulent air flow in large airways (similar sounds can be heard in healthy patients by listening over the trachea).
  • Sounds are harsh and poor in nature. Unlike normal vesicular breath sounds, there is a gap between the inspiratory and expiratory phase sounds.
  • Bronchial breathing suggests consolidation or fibrosis, which permits the sound to be conducted more effectively to the chest wall.
• Pleural rub: a creaking sound caused by stiff pleural membranes such as with pleurisy.
• Stridor: harsh inspiratory sound caused by partial obstruction of a large airway.
• Vocal resonance:
  • Place the stethoscope at various levels over the back and ask the patient to whisper “ninety-nine” each time. Note how well the sound is transmitted.
  • The sound is muffled over a normal lung, increased if there is consolidation and decreased or absent if there is effusion or collapse.
• Whispering pectoriloquy:
  • Is elicited as for vocal fremitus but ask the patient to whisper “one, two, three”.
  • Whispering pectoriloquy is the increased quality and loudness of whispers that are heard with a stethoscope over an area of lung consolidation.

Initial investigations
See the separate Peak Flow Recording, Spirometry and Chest X-ray - Systematic Approach articles.

Further reading & references

- Mosby's guide to physical examination; by Henry M. Seidel, MD, Rosalyn W. Stewart, MD, MS, MBA, Jane W. Ball, RN, DrPH, CPNP, DPNAP, Joyce E. Dains, DrPH, JD, RN, FNP, BC, DPNAP, John A. Flynn, MD, MBA, Barry S. Solomon, MD, MPH and Rosalyn W. Stewart, Elsevier 7th Edition

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