



Blood in sputum (hemoptysis)

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Rationale

Expectoration of blood can range from blood streaking of sputum to massive hemoptysis (greater than 200 mL/d) that may be acutely life-threatening. Bleeding usually starts and stops unpredictably, but under certain circumstances, it may require immediate control measures and airway establishment.

Causal Conditions

(list not exhaustive)

- Airway disease
 - a. Inflammatory (e.g., bronchiectasis, bronchitis)
 - b. Neoplasms (e.g., bronchogenic carcinoma)
 - c. Other (e.g., foreign body, trauma)
- Pulmonary parenchymal disease
 - a. Infectious (e.g., tuberculosis, necrotizing pneumonia)
 - b. Inflammatory/immune (e.g., vasculitis)
 - c. Other (e.g., coagulopathy)
- Cardiac/vascular
 - a. Pulmonary embolism (with infarction)
 - b. Elevated capillary pressure (e.g., mitral stenosis, left ventricular failure)
 - c. Arteriovenous malformation

Key Objectives

Given a patient with hemoptysis, the candidate will diagnose the cause, severity, and complications and will initiate an appropriate management plan. In particular, the candidate must determine if the patient requires urgent intervention and stabilization or if further investigation is needed to rule out serious underlying disease.

Enabling Objectives

Given a patient with hemoptysis, the candidate will

- list and interpret critical clinical findings, including
 - a. potential risk factors for causes of hemoptysis (e.g., smoking, asbestos exposure, anticoagulants); and
 - b. results of an appropriate history and physical examination aimed at determining the stability of the patient's condition and the underlying cause and excluding alternative diagnoses (e.g., hematemesis, epistaxis);
- list and interpret critical investigations, including
 - a. chest x-ray and other imaging, including computed chest tomography;
 - b. complete blood count and coagulation screen; and
 - c. tests for systemic disease; and
- construct an effective initial management plan, including
 - a. resuscitating and stabilizing the patient in case of massive hemoptysis;
 - b. outlining the treatment of causes that are not life-threatening and do not require immediate referral to a specialist;
 - c. determining whether the patient requires specialized care; and
 - d. determining whether there is an underlying trigger (e.g., smoking, work-related exposure) and outlining preventive measures.