

PULMONARY EMBOLUS

All perioperative patients are at risk of venous thromboembolism. Patients at increased risk include **trauma victims or those undergoing orthopedic or prostate surgery**. Patients with the **highest** risk for development of venous thromboembolism are those with **cancer, immobile patients, obese patients, smokers; and those taking oral birth control, hormone replacement therapy, or antipsychotics.**

Development of acute pulmonary embolism (APE) is life-threatening. The **most frequent source of pulmonary embolism is iliofemoral deep venous thrombosis.**

Preventive Measures

- Heparin
- Intermittent pneumatic compression device
- Aspirin
- Oral anticoagulants
- Statins
- Neuraxial blockade - Reduces mediator release and increases venous flow

Presentation Under Anesthesia

- Tachycardia
- Arrhythmias (often atrial fibrillation)
- Specific EKG changes including right heart strain or the rare but classic "S1, Q3, T3" pattern
- Hypotension
- Hypoxemia
- Decreased end-tidal CO₂

Loss of cardiac output occurs if a massive pulmonary embolus impedes ejection of the right ventricle. The right ventricle dilates restricting the left ventricle function secondary to inability to compensate for a sudden rise in the pulmonary vascular resistance.

Focus of Care

Immediate restoration of pulmonary blood flow

Norepinephrine - Vasopressor of choice for resuscitation pending definitive treatment

Nitric oxide - Lowers pulmonary vascular resistance

Impending circulatory collapse: **fibrinolysis is lifesaving**

ECMO: should be considered if fibrinolysis is contraindicated, pending interventional or surgical pulmonary thrombectomy.

Hemodynamic Goals

Support RV filling/contractility

Minimize pulmonary vascular resistance

Maintain preload

High risk of cardiac collapse upon initiation of PPV

Thrombolysis

Thrombectomy

Inotropes

Pulmonary vasodilators

Perioperative bridging of anticoagulation, always consider IVC filter