

# Pulmonary Embolism: Prevention and Treatment

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# Maternal Mortality in Palestine

- 23 deaths
- Second leading cause of death (after MI)
- All deaths occurred in the hospital
- 53% were between 20-29 years
- Highest maternal mortality rate in women >40 (143.74/100,000)
- 65% deaths occurred in postpartum period
  - 6 occurred within 24 hours
  - 10 occurred within 1 week

# Maternal Mortality in Palestine

- 9 cases (64%) – cesarean section
- 6 cases (35%) – vaginal delivery
- 8 cases – died of direct causes
  - 5 PE
  - 1 Hemorrhage
  - 1 Eclampsia
  - 1 Ectopic
- 11 cases – died of indirect causes
  - 7 from H1N1/pneumonia

# Maternal Mortality in Gaza

- 30 deaths in 2008-2009
  - 6 PE (20%)
  - 6 Heart disease (20%)
  - 5 Hemorrhage (16.7%)
  - 5 Sepsis (16.7%)
  - 3 PIH (10%)

# Pulmonary Emboli

- Deep venous thrombosis and PE are often preventable
- Pregnancy and postpartum are risk factors for venous thromboembolism (VTE)
- Industrialized nations – decline in MMR
- Incidence of VTE: 85/100,000
- DVT 3x more common than PE
- But VTE 5x more likely in postpartum period
- PE 15X more likely to occur in postpartum period
- DVT twice as high after C/S than VD

# Risk factors

- Cesarean section, premature delivery, h/o cardiac disease and multiple gestation
- High risk patients have deficiencies in:
  - Antithrombin
  - Protein C
  - Protein S
- Mutations in genes:
  - Factor V Leiden
  - Prothombin
- Presence of antiphospholipid antibodies

# Diagnosis DVT

- Symptoms: calf/thigh pain
- Signs: Leg calf >2cm than other
- Doppler ultrasound (venous color)
- MRI – if suspect pelvic thrombosis
- Ascending contrast venography considered gold standard, but rarely used because invasive
- **If positive – treat immediately**

# Diagnosis of PE

- Could do doppler to evaluate DVT, if positive treat. But <30% PE have a DVT diagnosed by u/s
- V/Q scan if CXR normal (131 mcgy)
- CT angiogram if CXR abnormal (370 mcgy)
- **If positive, admit and treat.**



# Treatment

- Heparin: pts with elevated risk of bleeding, hypotension or renal failure
  - For PE: treat IV first then switch to sc
  - For DVT: 5,000 IU bid
- Low-molecular weight heparin
  - Enoxaparin 1 mg/kg q 12 hours (anti-Xa level 1-2 IU/mL)
  - Switch to sc heparin at **36 weeks**
- Consider an inferior vena cava filter
  - Patient bleeding after surgery or has stroke
  - Anticoagulation ineffective or complications
  - Patient suffered a massive PE

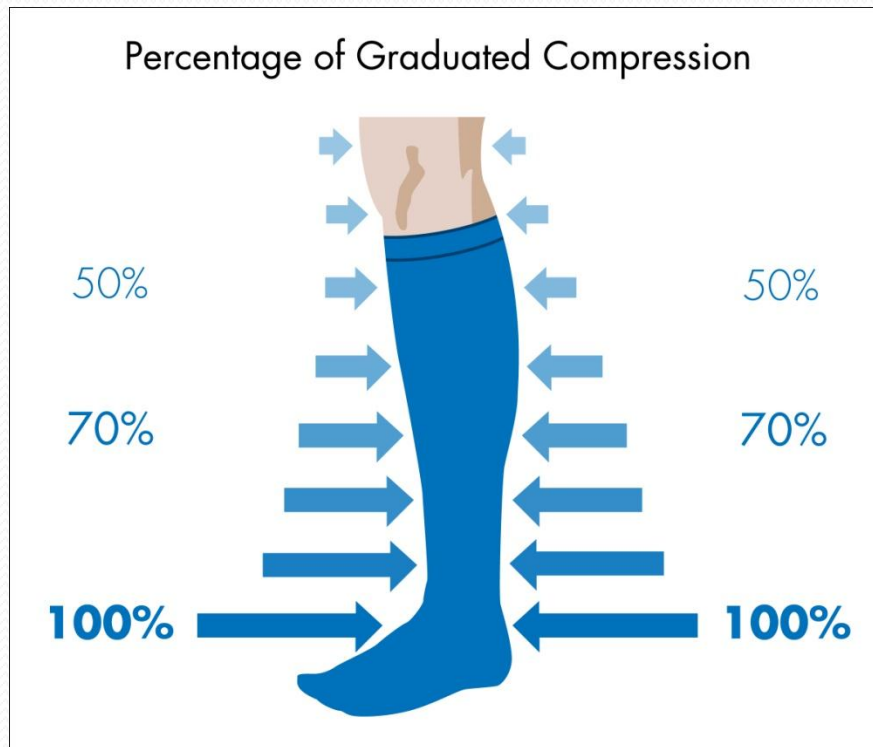
# Prevention

- Check family history of PE, if positive, consider testing for thrombophilia and mutations
- Check for patient history of DVT or PE
- Take patient's complaints about calf pain seriously
- American College of Chest Physicians guidelines for **thromboprophylaxis**
  - Prior episode VTE (DVT or PE)
  - Antithrombin deficiency

# Prevention

- Case-by-case basis for thromboprophylaxis
  - One episode of VTE with pregnancy or contraception
  - One episode of idiopathic VTE
  - One episode of VTE with thrombophilia
- What to do **during** a cesarean section?
  - One risk factor - pneumatic compression
  - ALL patients should either have compression stockings or pneumatic compression

# Compression vs Pneumatic boots



# Prevention/Treatment

- What to do after a delivery?
  - With risk factors:
    - Heparin restart **12 hours after cesarean section**
    - Heparin restart **6 hours after vaginal birth**
- 6 months of anticoagulation therapy

# Summary

- PE is a serious contributor of maternal mortality in Palestine
- Many PE's are preventable now that we are aware of the situation
- Obtain family history and patient's history
- **Use compression stockings on every patient who is having a cesarean section**
- Encourage early ambulation after delivery