Deep Vein Thrombosis
Treatment Options
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Who
More than 2 million suffer from venous thromboembolism each year.
Over half are hospital acquired and are within 30 days post hospitalization.

Deep Vein Thrombosis
1 in 10 of the more than 2 million Americans developing DVT’s goes on to perish from Pulmonary Embolus.
The incremental LOS and costs of treating a case of a preventative VTE are substantial.

Inpatient Costs:
- $10,000 per DVT
- $20,000 per PE

The Centers for Medicare and Medicaid Services is currently considering inclusion of hospital-acquired DVT and P.E. in the list of events for which hospitals will no longer be reimbursed.

Risk Factors
- Age: > 40 years
- Surgery / Especially Spine
- Heart Failure
- Malignancy
- Prior history of DVT/PE
- Immobility/paralysis
- Inflammatory disorders
- Obesity
- Varicose Veins
- Respiratory Failure
- Infections
- Active Collagen Vascular disorders
- Multi-trauma
- Chronic lung disease
- Thrombophilia
- Estrogen use
- Ischemic stroke
- Smoking

Thromboprophylaxis for Spine Surgery Patients
- Traditional Measures:
  - SCIW/early ambulation

Anticoagulation/Antiplatelet Medications
- Long-term anticoagulation medications
  - Enoxaparin (Lovenox)
  - Enoxaparin (Liquiparin)
  - Arka (Arka
desuxim)
  - Eglibs: (Eglibl)

- Non-barcoumbl
  - Lovenox
  - Lovenox
  - Inrix (Rivaroxaban)
  - Xarelto (Rivaroxaban)

Antiplatelets
- Aspirin
- Plavix (Clopidogrel)

Mechanical
- DVT Filters
  - Retrievable vs. permanent
Devastation to the Patient

- Increased Hospital Stay
  - 5–7 days after diagnosis
- Potential Bleeding Issues
- Frequent Lab Draw’s
- Costs

Complications of Thromboprophylaxis in Spine Patients

- Bleeding
  - Epidural Hematomas
  - Neurological Deficits
  - Gastric Bleeding/Ulcers
  - Thrombocytopenia
  - Wound Hematomas

Not only do patients with VTE suffer a 30% cumulative risk recurrence
Also at risk for potentially disabling Post-Thrombotic Syndrome
- Chronic disabling condition
- Peripheral edema
- Chronic pain
- Venous eczema
- Skin infection issues

Significant loss in Quality of Life
Indications for Placement of Inferior Vena Cava Filters

- History of Thromboembolism
- Diagnosed Thrombophilia
- Malignancy
- Bedridden > 2 weeks prior to surgery
- Staged Procedures or multiple levels
- Combined anterior/posterior approaches
- Expected need for significant iliocaval manipulation
- Single-stage anesthetic time > 8 hours.

IVC Filter Complications

- Issues with Implantation
- Retrieval
- Long term use

- Complications
  - Filter migration
  - Filter fracture
  - Filter perforations
  - Filter has tilted
  - Filter cannot be retrieved
  - Pulmonary embolism
  - Inferior vena cava syndrome
  - Death
VTE Prophylaxis Protocol for Spine Patients

- Pre-operatively (same day as surgery) and continues throughout hospitalization.
- 5000 Units heparin administered subcutaneously TID

- Except in patients older than 75 years or weigh less than 50 kg
  - These patients receive a dose BID

Our Protocol for DVT prophylaxis

- 5000 Units Heparin subcutaneously BID with 81 mg. E.C. ASA P.O.
- Started no longer than 12 hours after surgery and continued throughout hospitalization.
Incidence of DVT’s

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<tr>
<td>Total cases</td>
<td>710</td>
<td>256</td>
<td>437</td>
<td>165</td>
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<td># DVT</td>
<td>6</td>
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<td>Rate %</td>
<td>1.13%</td>
<td>2.33%</td>
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THANK YOU
Alternative Approaches to DVT prophylaxis in Spine Surgery

Recommendation for Prophylaxis of DVT

- Mechanical
  - Early ambulation
  - Sequential compression device

- Chemical
  - Medication

- DVT Filters
  - Permanent
  - Retrievable