A good number of patients die each year directly as a consequence of acute PE.

A substantial number of patients die from PE within one hour of presentation.

3 Month mortality in acute PE is 15%.
In 1856, Virchow proposed his triad of factors leading to intra-vascular coagulation.
Stasis

Vessel Wall Injury

Hyper-Coagulability

VTE

Deep Venous Thrombosis

Pulmonary Embolism

Clinical Awareness

Diagnostic Imaging Modalities

Therapeutic Interventions
Good News

Treatable

Preventable

PE/VTE
Potential Preventive Measures

1\textsuperscript{st} Prevention Measures

2\textsuperscript{nd} Prevention Measures

Potential Preventive Measures

Pharmacologic

Non-pharmacologic
I- Primary Prevention Measures

For patients at high risk to develop VTE

Acquired risk factors

A- Medical risk factors:
- Age older than 40 y.
- History of venous thromboembolism.
- Prior major surgical procedure.
- Varicose veins.
- Congestive heart failure.
- Myocardial infarction.
- Obesity.
- Pregnancy or postpartum period.
- Oral contraceptive therapy.
- Hormone replacement therapy.
- Cerebrovascular accident.
- Malignancy.
- Severe thrombocytemia.
- Antiphospholipid antibody syndrome
- (including lupus anticoagulant).

B- Surgical risk factors:
- Trauma (L.L.fractures).
- Orthopedic surgery (hip&knee replacement).
- Pelvi-abdominal surgery.
- Spinal surgery.
- Breast surgery.

Inherited risk factors

- Antithrombin III deficiency.
- Factor V leiden (activated protein C resistance).
- Prothrombin gene (C20210A) defect.
- Protein C deficiency.
- Protein S deficiency.
- Dysfibrinogenemia.
- Disorders of plasminogen.
- Hyperhomocysteinemia.
Pharmacologic Preventive Measures

- UFH.
- LMWH (Enoxaprine).
- Fondaparinux (Arixtra).
- Warfarin.
- NOACS.

Non-pharmacologic Preventive Measures

**Mechanical Measures**
- IPC.
- GCS.
- IVC filter.

**Life Style Measures**
- Early ambulation after surgery.
- Avoid sitting for long periods.
- Wear compressive stockings on long travels.
- Drink plenty of water.
- Avoid dehydration.
- Avoid mis-match between leg span and vehicle cabin space.
- Take foods which prevent b. clotting:
  - Sip grape juice.
  - Go for Garlic.
  - Enjoy virgin olive oil.
  - Eat kiwi.
  - Make leafy Greens a routine.
  - Limit animal fats in diet.
Prevention of pulmonary embolism is tailored to pre-existing co-morbidities.

<table>
<thead>
<tr>
<th>Patient Characteristics</th>
<th>Risk Factors</th>
<th>Type of Surgery</th>
<th>Prophylactic Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>↓ 40 years</td>
<td>-Ve</td>
<td>Minor</td>
<td>Only early rehabilitation</td>
</tr>
<tr>
<td>↑ 40 years</td>
<td>- Ve</td>
<td>Major</td>
<td>UFH /12HR Or LMWH Or Fondaparinux Or IPC</td>
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<tr>
<td>↑ 40 years</td>
<td>+ Ve</td>
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</tr>
<tr>
<td>↑ 40 year +</td>
<td>+ Ve</td>
<td>Major</td>
<td>Mechanical Measures</td>
</tr>
<tr>
<td>↑ Bleeding risk</td>
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</tbody>
</table>
II- Secondary prevention Measures for DVT or PE

For Those Who Experienced DVT or PE

Pharmacologic Measures

- Anticoagulation
  - 6-12 m if 1st Event
  - Long – life if Recurrent

Non-Pharmacologic Measures

- IVC Filter if Contraindication to Anti-coagulation
- Lifestyle Measures

Take Home Messages

- A good number of patients die yearly with acute pulmonary embolism and a substantial number die within one hour of presentation.
- Blood stasis, vessel wall injury and hyper coagulable states play the major scenario of venous thromboembolism.
- Frequently more than one risk factor for VTE is present.
- Patients hospitalized for medical problems face a thromboembolic risk similar to that of their surgical counterparts.
With the advances in clinical awareness, diagnostic imaging modalities and therapeutic interventions dramatic improvement in preventive and therapeutic measures are now available.

Knowledge of risk factors for VTE provides the rationale for both clinical suspicion and prophylaxis.

Ideal prophylactic measures should be effective, safe, cost-effective as well as well tailored to pre-existing co-morbidities.