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Stop the Clot! – Making Sense of the Thrombosis Clinic Model and Protocols
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What is Vascular Medicine?

- Niche specialty with emphasis is on clinical approaches to vascular disorders by physicians with special expertise and training in treating vascular disease
- Includes the non-invasive treatment of medical issues involving the circulatory system outside the heart including arterial, venous, and lymphatic disorders
- Entails a collegial interaction with a community of vascular professionals including Vascular Surgery, IC, IR, Vascular Ultrasound, Primary Care Physicians and other disciplines

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What is Vascular Medicine?

- Increased awareness last 20 years, ? Vascular Renaissance?
- Lead Public and Professional Educational Programs through the Society for Vascular Medicine
- Pioneer bench to bedside medical advances
- Educate health professionals about Vascular Medicine
- Team Based Vascular Care
- History of the Field/History of Interest

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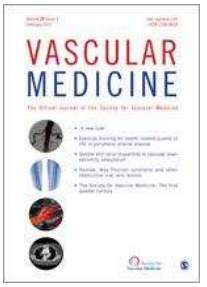
What is Vascular Medicine?

- **Society of Vascular Medicine**

Society for Vascular Medicine
formerly the Society for Vascular Medicine & Biology (SVMB)



- **American Board of Vascular Medicine**

American Board of Vascular Medicine
ABVM
Promoting the Highest Standards of Patient Care in Vascular Medicine Through Physician Certification

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What Makes Vascular Medicine Unique?

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We Have A Unique Skill Set!

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So What Do We Do?

- **The goal of the Vascular Medicine specialist is to improve the care of the patient with undiagnosed or complicated vascular disease**
- **Non-operative specialty, not a lot of us out there**
- **We specifically try to manage vascular disease "comprehensively", including before and after interventions**

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So What Do We Do?

- Medical Treatment of Vascular Disorders
- Follow Aneurysms and Stenosis
- Follow patients with unusual vascular disorders
- Focus on Primary/Secondary Prevention
- Optimize and prepare patients for vascular intervention procedures

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So What Do We Do?

- Vasculitis and CTD
- Venous Thromboembolism and Thrombophilias
- Upper and Lower Extremity Venous and Arterial Disease
- Perioperative Management of Vascular Surgery
- Arterial and Venous Testing in the Vascular Lab
- Wound Care
- Atherosclerosis –Early Detection, Standardized Therapies, Surveillance and Outcomes

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Common Vascular Medicine Consultations

- Carotid Artery Disease
- Peripheral Artery Disease
- Aneurysms
- The Swollen Limb
- VTE and Chronic Venous Insuffiency
- Thrombophilias
- Risk Factor Modification in Vascular Patients
- Diagnostic Testing Abnormalities
- Unusual Vascular Disorders

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Unusual Vascular Disorders

- Hypercoagulable States/Thrombophilias
- Thermal Disorders including Frostbite, Pernio, Cryoglobinemia, Raynauds, Erythromelalgia
- Non-Atherosclerotic Vascular Disorders such as Fibromuscular Dysplasia, Popliteal Artery Entrapment Syndrome, Cystic Adventitial Disease, External Iliac Artery Endofibrosis, TAO/Buerger's disease (think of these disorders in young patients with no risk factors for ASO)
- Uncommon arteriopathies such as Vasculitis

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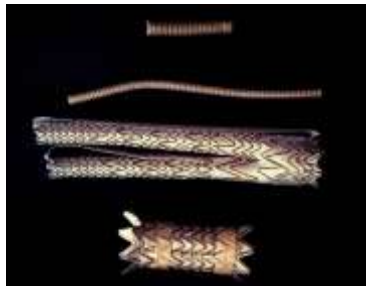
What We Don't Do!



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Vascular Medicine at the UPMC Heart and Vascular Institute

- Comprehensive Program and Model
- Eclectic Outpatient Consultative Services
- Inpatient Consultations
- Multidisciplinary Comprehensive ASO Clinic
- Thrombosis Clinic and Coagulation Clinic
- Stroke Bridge Clinic/Post Stroke Risk Factor Management Clinic
- Centralized Outpatient Vascular Lab
- Screening Programs/Pilot Programs

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UPMC Hamot Vascular Program

- Multidisciplinary
- Team Approach with Resources/Support
- Center of Excellence
- Vascular Medicine as the Front Door
- Complementary and Cooperative
- Screening
- Atherosclerosis Clinic Model
- RFM Model and Report Cards

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Multidisciplinary Comprehensive Atherosclerosis Clinic

- Early Detection/Treatment
- Surveillance and Outcomes
- Screening Programs and Expos
- Data Mining Excursions with EMRs (Epic)
- Medical Nutrition/Smoking Cessation/NA
- Exercise Programs/Walking Programs
- Patient Education and Branded Handouts
- Report Cards/Outcomes

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Vascular Lab

- Centralized Outpatient Lab at the HHVI
- ICAVL Accredited
- SVU Signature Lab
- Reading Panel
- Expectations and Oversight
- Potential for Core Lab Research

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Thrombosis Clinic

- VTE Usual and Unusual
- Low Risk DVT Disposition Program with Admit/Readmit Prevention
- PERT Program with CDT and mechanical thrombectomy
- Vascular Services Council and HHVI Leadership
- System Wide Anticoagulation Committees and Pathways
- Anticoagulation Clinic Model

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The Burden of Vascular Disease

- Greater than 25 million people living in the US suffer from non coronary vascular disease
- Represents the single most important cause of death and disability in our nation and will remain so for decades ahead. Examples include:
  - PAD - affects 1 in 5 males, 1 in 6 females age greater than 65, > 8-11 million Americans
  - DVT/PE – most preventable cause of hospital death
  - Aneurysms
  - CVA - Unusual Vascular Disorders
  - "Orphan Disorders" – Lymphedema/CVI

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Venous Thromboembolism (VTE)

- Deep Venous Thrombosis
- Pulmonary Embolism
- VTE in Unusual Sites

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Venous Thromboembolism

- Pathophysiology
- Risk Factors
- Diagnosis/Clinical Prediction Rules
- Treatment and Recurrence Risk
- New and Emerging Therapies
- Updated ACCP Guidelines
- Outpatient VTE Therapies
- Hospital Outcomes

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Virchow's Triad
Rudolf Virchow c. 19th Century

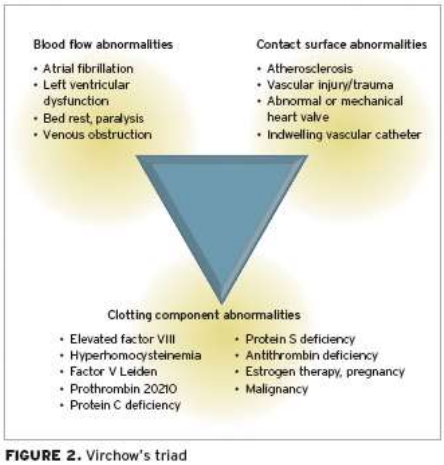

FIGURE 2. Virchow's triad

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Virchow's Triad

- **Damage to the Lining of Vein**
  - **Permits clots to attaches themselves to the damaged portion (e.g. hip/knee surgery, CHF)**
- **Slowing of Blood Flow**
  - **Allows clumping of blood coagulation factors that would normally be washed away (e.g. bedrest)**
- **Increased Tendency to Clot**
  - **Encourages rapid clot formation (e.g. cancer/ID)**

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Epidemiology of DVT/PE

- **At least 600,000 Americans suffer PE and over 1 million suffer DVT annually, some estimates 3X higher**
- **100,000-180,000 US deaths per year, kills more people than traffic accidents, HIV and breast cancer per year**
- **PE is the #1 preventable cause of death among hospitalized patients**
- **Negative impact on QOL of survivors: CTEPH and PTS**
- **Health care costs over 10 billion dollars in 2011**

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Prevention

- Significant medical/financial impact of VTE
- System wide approach to Prevention
- Over 2 million people develop DVT annually
- DVT progress to PE in 600,000 cases with 60,000 fatalities
- Morbidity of the debilitating post thrombotic syndrome can arise in 1/3, esp. in patients with extensive or recurrent DVT

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My Approach to VTE

- First Event or Recurrent
- Location Usual or Unusual
- Provoked or Unprovoked/Idiopathic
- Unusual Historical Features or Factors
- Site Confirmation – Distal/Proximal/Iliacs
- Massive/Submasssive/Low Risk for PE
- Pick Treatment
- Pick Duration
- Prevent Complications

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My Approach to VTE

- Provoked vs Unprovoked Recurrence Risk
- DVT Cephalad Propagation Risk
- Renal/Hepatic Function
- Access to Laboratory Monitoring
- Patient Compliance
- Compression Regimens
- ACCP/CHEST 2016

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DVT

- Deep Veins of the arms and legs most common
- Legs
  - Proximal
  - Distal
- Definition
  - Venous thrombi typically form along the valve cusps
  - Propensity to embolize greatest in the first 7 days

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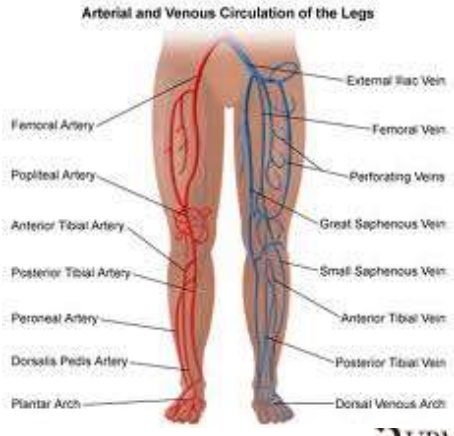
LE Venous Anatomy



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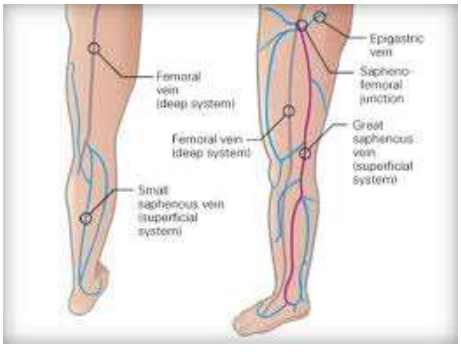
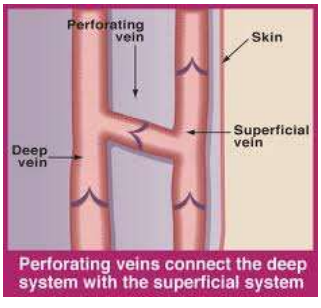
Venous Anatomy





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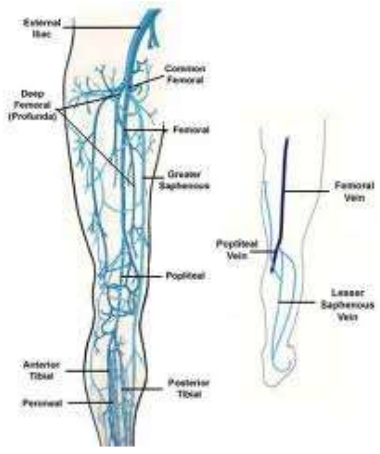
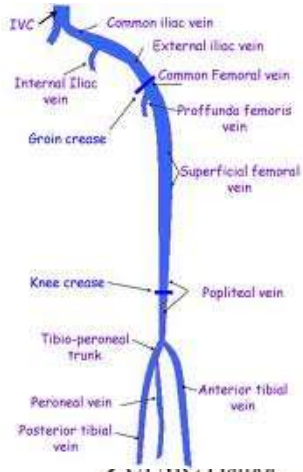
LE Venous Nomenclature





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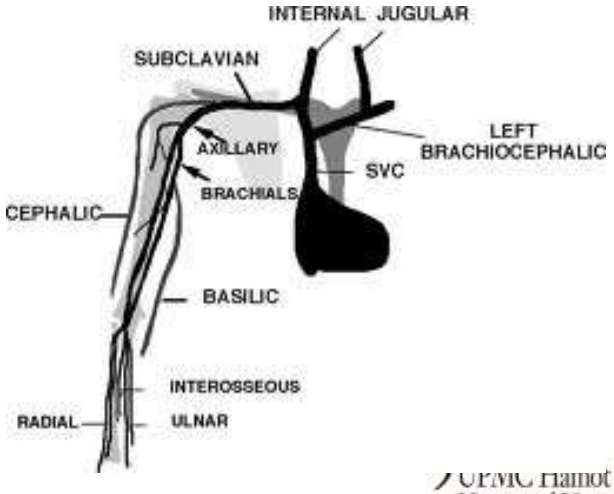
UE Venous Anatomy



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Definitions of Pulmonary Embolism via Guidelines

- Massive PE (5-10%): Sustained hypotension, pulselessness, or persistent bradycardia
- Submassive PE (20-25%): RV dysfunction or myocardial necrosis, without hypotension
- Low Risk PE (70%): no markers of adverse prognosis
  - (Circulation 2011; 123: 1788-1830)

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Risk Stratification in PE Essential for Management

- Anticoagulation alone versus anticoagulation plus thrombolysis/pharmacomechanical catheter directed therapy/surgical embolectomy/IVC filter
- Triage ICU monitoring vs other
- Low Risk get A/C alone, High Risk get A/C plus lysis or embolectomy
- Submassive is the grey area

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Risk Factors for VTE

- Surgery/Trauma/Acute Medical Illness
- Immobility /LE paresis/ Stroke
- Cancer/Cancer Therapy/PNH/Myeloprolif d/o
- Previous VTE
- Increasing age/Obesity/Smoking
- Estrogens/Inherited/Acquired Thrombophilias
- Nephrotic Syndrome /Inflammatory Bowel Dis
- Central Venous Catheters
- Rheumatoid Arthritis
- Chronic Liver Disease (up to 1%)

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Risk Factors for VTE

- Strong – Odds Ratio > 10
  - Fracture – hip/leg
  - Hip or knee replacement
  - Major general surgery
  - Major trauma
  - Spinal cord injury

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Risk Factors for VTE

- **Moderate – Odds Ratio 2-9**
  - **Arthroscopic knee surgery**
  - **CVL**
  - **Chemotherapy/Malignancy**
  - **CHF/Respiratory Failure**
  - **HRT/BCP/Pregnancy/Post Partum**
  - **Paralytic stroke**
  - **Thrombophilia/Previous VTE**

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Risk Factors for VTE

- **Weak – Odds Ratio < 2**
  - **Bedrest > 3 days**
  - **Immobility due to sitting e.g. prolonged car or air travel**
  - **Increasing age**
  - **Laparoscopic surgery**
  - **Obesity**
  - **Varicose Veins**

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Aggressive Thrombophilias

- Homozygous/Double Heterozygous Mutations
  - Factor V Leiden
  - Prothrombin 20210A
- Antiphospholipid Antibody Syndrome
  - LA + - Confirm/Repeat
- Deficiencies:
  - Antithrombin
  - Protein C
  - Protein S

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Clinical Features - DVT

- Non specific
- Clinical findings not reliable
- Pain/redness/warmth common symptoms
- Swelling and tenderness are common signs
- Venous distension/palpable cords not specific
- Homan's sign not often found
- About a 42% chance of making diagnosis on physical exam
- About half of DVT patients are asymptomatic

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Clinical Features - PE

- Unexplained shortness of breath
- Pleuritic chest pain
- Hemoptysis
- Tachycardia
- Hypotension
- Syncope
- Anxiety

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Clinical DVT

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Phlegmasia Cerulea Dolens

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Differential Diagnosis - DVT

- Muscle Strain or Tear
- Bakers Cyst
- Lymphangitis/Lymphatic Obstruction
- Venous Reflux
- Cellulitis
- Internal abnormality of the knee

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Clinical Prediction Rules

- Integrate the results of a clinical index with the results of an ultrasound examination
- Enhance the predictive accuracy of a positive ultrasound to 100%, 96%, and 63% in high, moderate, and low probability groups
- Wells' Prediction Index
- DVT and PE

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Wells DVT Criteria

Symptom	Score
Active cancer (treatment ongoing or within previous 6 months or palliative)	1
Paralysis, paresis or recent plaster immobilization of the lower extremities	1
Recently bedridden > 3 days or major surgery within 4 weeks	1
Localized tenderness along the distribution of the deep venous system	1
Entire leg swollen	1
Calf swelling 3 cm > asymptomatic side (measured 10 cm below tibial tuberosity)	1
Pitting oedema confined to the symptomatic leg	1
Collateral superficial veins (non-varicose)	1
Alternative diagnosis as likely or greater than that of DVT	2

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Wells DVT Criteria

- Score of 3 or greater represents high probability
- Score of 1-2 represents moderate probability
- Score of less than or equal to 0 represents low probability
- Think “Low or Non-Low”

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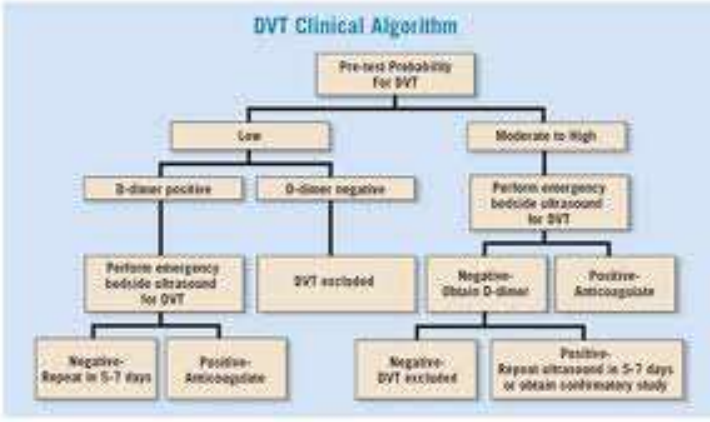
DVT Clinical Algorithm



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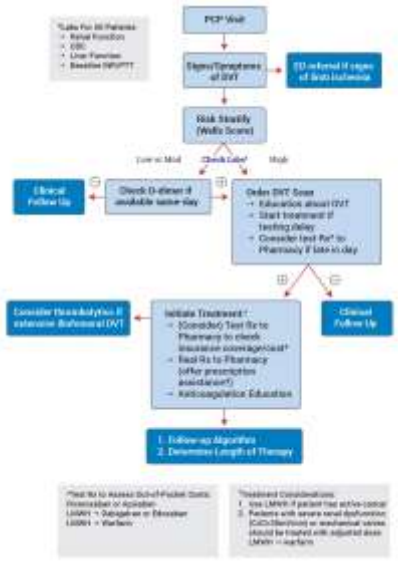
DVT Flow Chart



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The Vascular Lab

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The Vascular Lab and Testing/Diagnosis

- **Venous Testing – Venous Thrombosis**
  - **Venous Duplex Testing with DVT Protocol**

- **CTA Chest protocol for PE**

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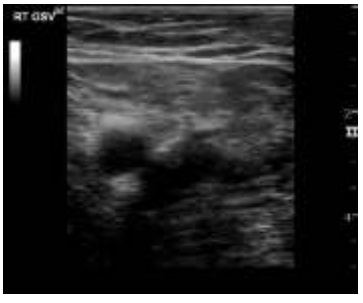
Venous Compression Images



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DVT CFV

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Jugular Vein VTE

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Treatment of VTE

- ACCP Guidelines Updated 2016
- UFH (1B)
  - Weight=based nomograms/HIT incidence 5-7%
- LMWH (1A)
  - Weight based/Avoid in RF/Preferred IA Rx
  - HIT incidence less than 1%
- Fondaparinux (1A)
  - Acceptable Rx/Avoid in RF/One case of HIT
- VKA/Warfarin/New Agents and New Recommendations
  - Acceptable Rx/Avoid in Pregnancy

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Recurrence Rates after Anticoagulation Discontinuation

Risk Factor	Recurrence Rate 1/5 yr	
Surgery	1%	3%
Nonsurgical Reversible/Transient Risk Factor	5%	15%
Unprovoked	10%	30%

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Treatment of DVT

- **Provoked**
  - **3 months**
- **Recurrent/Unprovoked**
  - **3 months then shared medical decision making discussion regarding recurrence risks, bleeding risks, etc.**
- **Thrombophilia-Related**
  - **Probably based on clinical factors, patients with APLAS should receive anticoagulation indefinitely**

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Unprovoked/Idiopathic DVT

- **Occurs without a clearly identified risk factor i.e. surgery or transient risk factor**
- **Recurrent risk accumulates once anticoagulation is stopped**
- **Three historical strategies to identify high risk:**
  - **D-dimer testing**
  - **Evaluation for residual vein thrombosis**
  - **Clinical prediction rules**

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Treatment of DVT

- **Idiopathic VTE**
  - 3 month duration or more
  - Risk of recurrence 7-10% per year and 30-42% at 5 years
  - D-dimer predictor 3% negative and 10%/yr. +
- **Cancer**
  - Recurrence rate up to 30% per year
  - LWMH preferred treatment for at least 6 months or until cancer is no longer “active” (CLOT trial)

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Who Get’s Secondary Prevention?

- **First unprovoked VTE with low-moderate bleeding risk (2B)**
- **Second unprovoked VTE with low-moderate bleeding risk (1B)**
- **Therapy should be re-assessed annually!**

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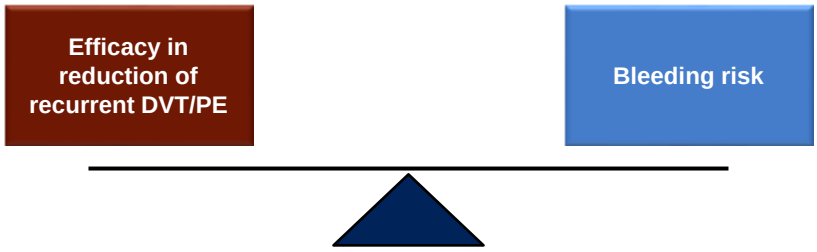
Extended Treatment for DVT and PE: Finding the Balance



- Clinicians must often balance the long-term risks of recurrent VTE if anticoagulation is stopped against the burden and risks of ongoing therapy

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ABC's of Bleeding Risk Assessment

- Age > 65, Antiplatelet Therapy, Alcoholism
- Bleed History
- Cancer
- Diabetes
- Anemia
- Falls
- GFR Decrease
- Hepatic Disease
- Stroke
- Surgery (recent)
- Thrombocytopenia

Low 0 RF
Mod 1 RF
High 2 or more RF

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Bleeding Risk Assessment

Risk Category	Bleeding Rate
Low	2.4/100 pt. years (3fatal)
Moderate	4.9/100 pt. years (5fatal)
High	9.8 /100 pt. year(11fatal)

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HAS-BLED Score

- Hypertension
- Abnormal Liver/Renal Function
- Stroke History
- Bleeding Presentation/History
- Labile INRs
- “Elderly” Age 65 or greater
- Drugs/Alcohol Use

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HAS-BLED Score

- Score of 0 is 0.9% risk of bleeding in one validation study and 1.3 bleeds per 100 patient/years in another validation study
- Score of 5 is 9.1% risk of bleeding in one validation study and 12.5 bleeds per 100 patient/years in another validation study

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MEN and HERDOO2

- Risk Factors for Recurrent VTE
- MEN and signs of post thrombotic syndrome:
- Hyperpigmentation of the lower extremities
- Erythema or Redness of the LE
- D-dimer level greater than 250 mcg/L
- Obesity with BMI greater than 30 kg/m2
- Older age > 65 years
- Two or more risk factors at higher risk
- Recent paper regarding women with scores of 0 and 1

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ACCP 2016 Updates

- For VTE and no cancer, DOACs over VKA, and VKA over LMWH
- For VTE and cancer, LMWH or VKA and DOACs
- No changes in duration
- Recommend against IVC filters if on A/C
- Recommend thrombolytic therapy with PE and hypotension, and systemic therapy over CDT
- For recurrent VTE on a non-LMWH anticoagulant, recommend LMWH, if on LMWH, then increase dose

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Preventing Post thrombotic Syndrome

- Chronic burdensome consequence of DVT that occurs despite anticoagulation therapy
- 23-50% of patients and manifests typically in first 2 years
- Leg pain, heaviness, swelling, and cramping
- Severe cases include venous ulcers
- Villalta scale categorizes into mild, moderate or severe – wait 3 months to attribute the diagnosis

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Post thrombotic Syndrome

- Compression stockings may reduce risk (of any severity) from 43% to 20% and severe post thrombotic syndrome from 15% to 7%
- 30-40 mmHg and consider continuing for a minimum of two years if patient has swelling or discomfort
- Start as soon as possible after starting anticoagulation therapy

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Anticoagulants and Antiplatelets

- Aspirin - Oral
- Warfarin - Oral
- UFH/LMWH - Parenteral
- Fondaparinux - Parenteral
- NOAC/NOAC/TSOAC/DOAC - Oral
- Dabigatran –Direct Thrombin Inhibitor
- Rivaroxaban – Xa Inhibitor
- Apixiban – Xa Inhibitor
- Edoxaban – Xa Inhibitor

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Treatment of VTE

- Initial anticoagulation used to require overlap "bridging" of a parenteral anticoagulant (UFH, LMWH or fondaparinux) with VKA for a minimum of 5 days and until INR above 2 for at least 24-48 hours
- New agents are now a recommended option
- Determine length of anticoagulation
- Prevent post thrombotic syndrome
- Appropriate screening for occult malignancy prn

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Treatment of VTE

- Idiopathic/Unprovoked VTE
  - 3 month duration, then decide on more
  - Risk of recurrence 6-10% per year
  - D-dimer predictor 3% negative and 10%/yr +
- Cancer
  - Recurrence rate up to 30% per year
  - LWMH preferred treatment for at least 6 months or until cancer is no longer "active" (CLOT trial)

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Treatment of VTE

- Rapid initiation of anticoagulation prevents thrombus extension and PE
- Extended anticoagulation reduces the risk of recurrent VTE
- Don't forget compression stockings if indicated for discomfort and ? prevention of post thrombotic syndrome
  - 30-40 mmHg for at least 2 years

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Direct Oral Anticoagulants (aka NOACs/DOACs)

- Non-Bridged
  - Rivaroxaban/Xarelto
    - Once a day dosing
    - Starter Pack Available with Free Voucher
  - Apixiban/Eliquis
    - Twice a day dosing
- Bridged with LMWH or UFH
  - Edoxaban/Savaysa
  - Dabigatran/Pradaxa

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Practical Management Issues with Anticoagulants including New Oral Anticoagulants (DOACs)

- Starting
- Switching
- Monitoring
- Stopping/Reversal/Procedural Considerations

ASA for Preventing VTE Recurrence WARFASA

- **VTE Recurrence**
  - **ASA 6.6% per year vs.**
  - **Placebo 11.2% per year**
- **Major bleeding (100 mg/d)**
  - **One patient per group**

ASA more effective than placebo for decreasing the risk of recurrent VTE in patients after VKA therapy following first idiopathic VTE

NEJM 2012:366:1959

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Aspirin for VTE Recurrence Prevention - ASPIRE

- 100 mg dose of ASA reduced by one third the rate of recurrent major vascular events for patients inc VTE, MI, stroke or CV death
- Enrolled patients who had one acute unprovoked VTE and were switched after 3 months of anticoagulant therapy to either ASA or placebo
- Low numbers and power for prediction
- Reasonable "intermediate option"

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SVM/ABIM Choosing Wisely Campaign

- Don't do a work up for a clotting disorder for patients who develop first episode of DVT in the setting of a known cause
  - Increased testing with no proven benefit
- Don't reimage DVT in the absence of a clinical change
  - Repeat ultrasound images to evaluate the "response" of a venous clot to therapy does not alter treatment

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Vena Cava Filters

- Two primary indications
  - Absolute contraindication to anticoagulation
  - Failed anticoagulation – i.e. recurrent thromboembolism while receiving therapeutic doses of anticoagulation
- Do not afford protection from further DVT, rather increase the risk of secondary DVT
- Permanent vs Retrievable

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New/Emerging Therapies

- Catheter Directed Thrombolysis
- Mechanical Thrombectomy
- Treatment of Ilio-Femoral DVT
- Anticoagulants and Antiplatelets
  - –DOACs/NOACs
  - –Reversal Agents

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Catheter Directed Thrombolysis

- Delivers thrombolytic agent locally into thrombus using infusion catheters
- Accelerates thrombolysis, reduces dose/duration and decreased bleeding complications as compared to systemic thrombolysis
- EKOS program
- Urokinase and rt-PA have been studied
- Ileofemoral segment DVT results promising for lysis, preservation of valve function and decreased post thrombotic syndrome

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Percutaneous Mechanical Thrombectomy

- Can be used in combination with CDT
- AngioJet System directs saline jets to macerate and remove thrombus
- Trellis device uses occlusive balloons and dispersion wire to remove thrombus
- Combined with CDT has potential to remove more clot as well as decrease the dose and duration of thrombolytic therapy

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VTE Prophylaxis in Hospitalized Medical Patients

- MEDENOX
- PREVENT
- ARTEMIS

All q day dosing

- Once daily injected low-dose anticoagulant prophylaxis placebo-controlled trials
  - Reduced DVT greater than 50% without increasing major bleeding

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VTE as the First Manifestation of Cancer

- Strong consideration should be given regarding cancer screening for an idiopathic VTE event
- Patients with idiopathic VTE have a significant risk of occult cancer within the first year after diagnosis
- History/Physical
- Up to date with general health maintenance issues

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Outpatient Treatment of DVT and PE

- **ACCP Guidelines 1B for Acute DVT**
  - Initial therapy at home over treatment in the hospital
- **ACCP Guidelines 2B for Low-Risk PE**
  - Initial treatment at home or early discharge over standard discharge (PE is a tougher call due to litigious culture)
- **Contingent on adequate home circumstances**
  - Well maintained living conditions/phone access
  - Strong support network/patient feels well enough
  - Patient has ability to promptly hospitalized if necessary

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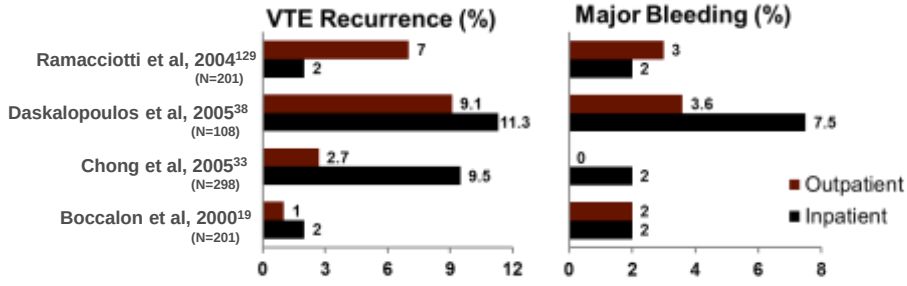
Acute DVT May Be Managed in the Outpatient Setting

- Controlled clinical trials suggest that outpatient management is at least as effective as inpatient management for acute DVT



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Considerations for Patient Selection for Outpatient Therapy

- 60%-95% of patients with acute, proximal DVT may be eligible for outpatient therapy
- Exclusion criteria on institutional protocols include:
  - Comorbid illness requiring hospitalization
  - Active or high risk for bleeding
  - Severe hypertension
  - Catheter-associated DVT
  - Recent surgery
  - Morbid obesity
  - Hypercoagulable state
  - Pregnancy

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Considerations for Identifying Patients With Low-Risk PE

- Risk stratification tools may help to identify patients with low-risk PE who may be candidates for outpatient therapy
- Potential candidates include patients with acute PE who are:
  - Clinically stable with good cardiopulmonary reserve
  - No recent bleeding
  - No severe thrombocytopenia (ie, platelet count ≥70,000/mm^3)
  - No severe liver or renal disease
  - Expected to be compliant with treatment
  - Feeling well enough to be treated at home

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The PESI and Simplified PESI Are Validated Tools Used to Identify Low-Risk Patients

Variable	Score	
	PESI	sPESI
Age >80 years	Age in years	1
Male sex	10	0
History of cancer	30	1
History of heart failure	10	1*
History of chronic lung disease	10	
Pulse ≥110 bpm	20	1
Systolic BP <100 mm Hg	30	1
Respiratory rate ≥30 breaths/min	20	0
Temperature <36° C	20	0
Altered mental status†	60	0
SaO_2 <90%‡	20	1

Classification by Total Score		
PESI		sPESI
Class I	≤65	Low risk=0
Class II	66-85	
Class III	86-105	High risk≥1
Class IV	106-125	
Class V	>125	

*Heart failure or history of chronic lung disease combined into a single category of chronic cardiopulmonary disease.
†Disorientation, lethargy, stupor, or coma. ‡With or without the administration of supplemental oxygen.

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Who May Be Candidates for Outpatient Therapy?

- The decision to treat a patient with DVT or low-risk PE in the outpatient setting is based on numerous factors:
  - Adequate home circumstances
  - Risk factors for recurrence and/or bleeding
- Risk stratification tools may aid in patient selection
- The actual decision depends on the clinical judgment of the treating clinician

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Outpatient Treatment of VTE

- Despite outpatient options for DVT and low-risk PE, hospital admissions for VTE remain high
- Average cost in 2005 for admitted DVT was $10K and for PE about $15K
- If you aren't admitted, you can't be readmitted!
- Hospital admissions can lead to complications
- New oral drugs can decrease LOS, in one study with Xarelto resulted in 3 day decrease in LOS

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UPMC System Wide Approach

- System Wide Anticoagulation Committee
- System Wide P&T Committee
- Pilot Programs including Xarelto To Go
- Trifold Handouts for Clinicians
- Xa level (rather than aPTT) monitoring for UFH
- HIT protocols

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The Real Value of Vascular Medicine?

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Thank You!

If Women Ran the World

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