Acute DVT
Who do we treat?
How do we do it?
When should patient be seen?

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Disclosures

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Case 1: 55M with HTN

- Post hospital follow up
  - Admitted for 3 days with COVID after travel outside the country
  - Improving, but still weak, sedentary since discharge

- Meds: lisinopril
- Review of systems: negative
- Vitals: unremarkable

- Physical exam
  - 2+ pitting edema along right shin/ankle
  - Mild calf tenderness, erythema
  - ~3cm larger than left
  - Normal left leg
  - No other findings

You suspect?

A. Cellulitis
B. Gastrocnemius muscle rupture
C. Deep Vein Thrombosis
D. None of the above

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Next Step?

A. Risk stratify
B. Obtain D-dimer
C. Obtain DVT ultrasound
D. Start anticoagulation

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Wells Score for DVT Risk Stratification

Clinical Characteristic	Points
Active cancer (chemotherapy within 6 months or current palliative care)	1
Paralysis, paresis, or recent plaster cast immobilization of the lower extremity	1
Recently bedridden for 3+ days, or major surgery within prior 12 weeks requiring general or regional anesthesia	1
Localized tenderness along deep vein distribution	1
Entire leg swollen	1
Calf swelling ≥3cm more than asymptomatic leg (measure 10cm below tibial tuberosity)	1
Pitting edema confined to symptomatic leg	1
Collateral superficial veins visible (non-varicose)	1
Previously documented DVT	1
Alternative diagnosis at least as likely as DVT	-2

Pretest Probability

- **Score ≥ 3:** high (≥ 50% prevalence)
  - DVT Ultrasound
- **Score 1 to 2:** intermediate (~25%)
  - D-dimer
- **Score 0 or lower:** low (≤ 10%)
  - D-dimer
- CBC, CMP, INR/PTT

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N Engl J Med 2003;349(13):1227-35

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Right Leg Venous Ultrasound

- Acute thrombus in
  - Soleal
  - Gastrocnemius
- Calf vein thrombosis??
- What do you do??
  - Minimal symptoms

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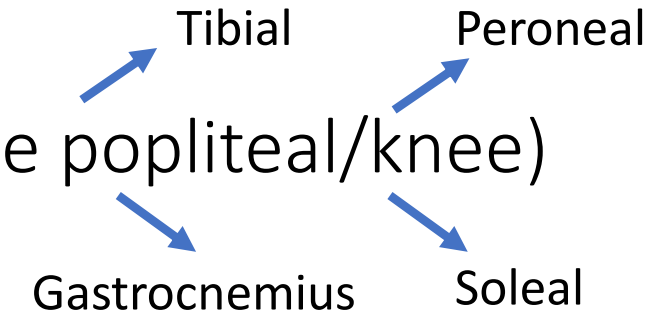
Acute Isolated Distal DVT (below the popliteal/knee)



- Positive D-dimer (w/o other reason)
- >5cm in length, >7mm diameter
- Multiple veins
- Unprovoked
- Prior history of VTE
- Associated with COVID
- Severe symptoms
  - Low bleeding risk

YES ➢Anticoagulation

NO ➢Serial Imaging x2 weeks

- Extension
  - Anticoagulation
- No extension
  - Nothing to do

Robert-Ebadi, Thromb Res 2016;149:48
Stevens, et al. Antithrombotic Therapy for VTE Disease. CHEST. 2021

Assess Bleeding Risk

- Active Bleeding
- Recent significant bleed
- Surgery w/in 2 weeks
- Neurosurgery w/in 4 weeks
- Major trauma w/in 4 weeks
- Stroke w/in 4 Weeks
- Thrombocytopenia
- High fall risk
- High HAS-BLED score

Hypertension Uncontrolled, >160 mmHg systolic	No 0	Yes +1
Renal disease Dialysis, transplant, Cr >2.26 mg/dL or >200 µmol/L	No 0	Yes +1
Liver disease Cirrhosis or bilirubin >2x normal with AST/ALT/AP >3x normal	No 0	Yes +1
Stroke history	No 0	Yes +1
Prior major bleeding or predisposition to bleeding	No 0	Yes +1
Labile INR Unstable/high INRs, time in therapeutic range <60%	No 0	Yes +1
Age >65	No 0	Yes +1
Medication usage predisposing to bleeding Aspirin, clopidogrel, NSAIDs	No 0	Yes +1
Alcohol use ≥8 drinks/week	No 0	Yes +1

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- Prior history of VTE
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- Severe symptoms
  - Low bleeding risk

YES ➢Anticoagulation

Same duration as proximal DVT

- Popliteal vein and above

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Outpatient vs Inpatient

Outpatient

- Uncomplicated
- More convenient
- Less expensive

Inpatient

- Limb threatening
- High bleeding risk
- Significant pain
- Medication access issues
- Adherence issues
- Limited/no support at home

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Anticoagulation Options

Direct Oral Anticoagulant (DOAC)

- Do not require monitoring
- Easy Administration
  - Require loading/lead-in therapy
- Drug-Drug interactions
- Renal and liver dysfunction
- Reduced absorption
  - Gastrointestinal bypass/resection
- Lower bleeding risk
  - ❖Gastrointestinal/Genitourinary cancer
- Lower recurrent thrombosis
  - ❖Antiphospholipid antibody syndrome
- Weight >120 kg → Apixaban/ Rivaroxaban

Vitamin K Antagonist (VKA)

- Regular INR monitoring
  - Goal INR 2-3
- Require lead-in parenteral AC
- Drug-Drug interactions
- Renal and liver dysfunction
- Dietary restrictions

- Higher bleeding risk in general
  - ❖Intracranial
- Higher recurrent thrombosis
  - ❖Cancer

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DOAC Considerations

Renal Impairment

- Apixaban
  - No dosage adjustment
- Dabigatran not recommended
  - CrCl ≤30 ml/min or dialysis
- Edoxaban
  - CrCl 15-50 ml/min → 30mg daily
  - CrCl <15, HD → Not recommended
- Rivaroxaban not recommended
  - CrCl <30 ml/min, dialysis

Hepatic Impairment

- Apixaban
  - Avoid in Child-Pugh class C
- Dabigatran
  - No dosage adjustment
- Edoxaban
  - Child-Pugh class B/C → Not recommended
- Rivaroxaban
  - Child-Pugh B → Avoid, use with caution
  - Child-Pugh C → Not recommended

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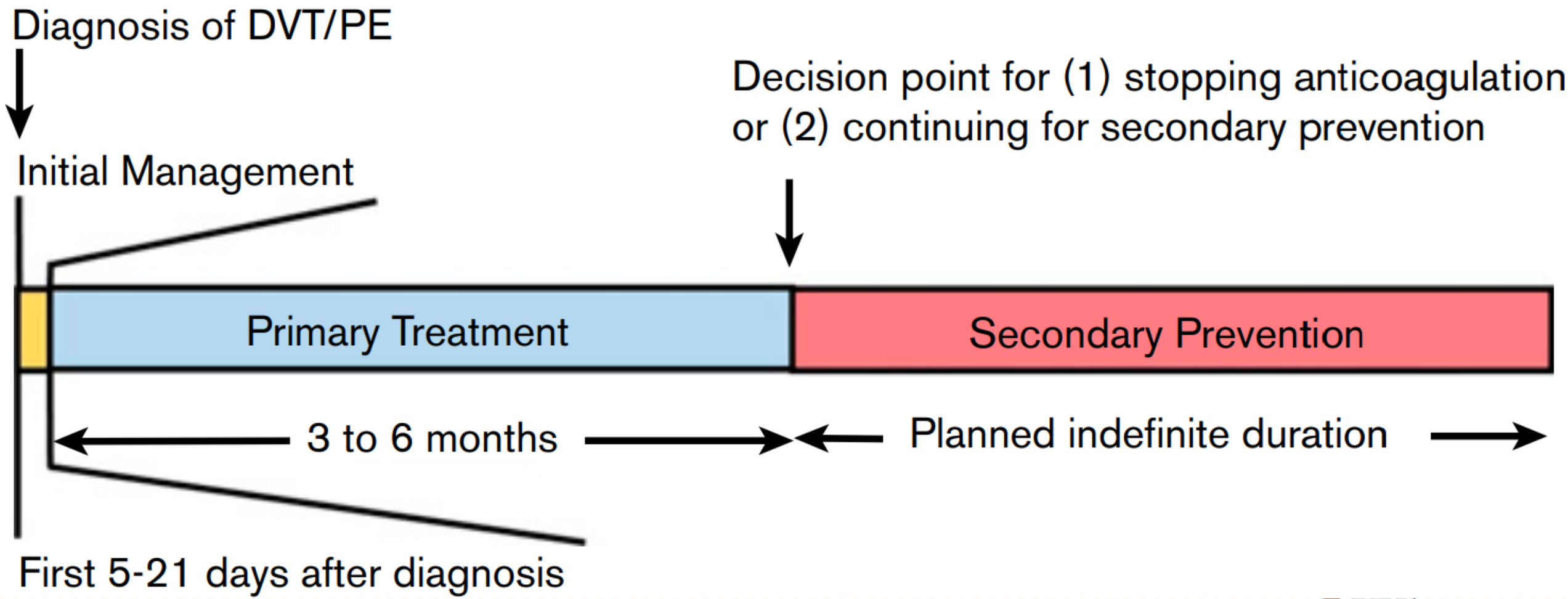

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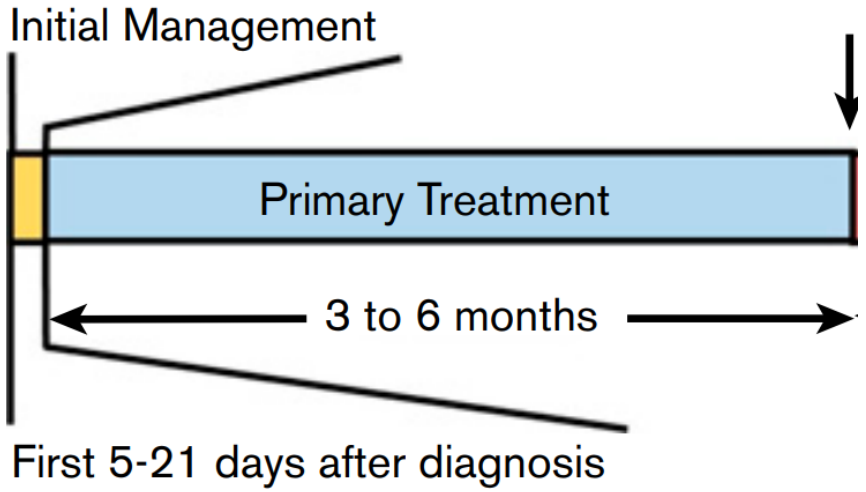

Initial Management

- Apixaban
  - 10mg twice/day x 7 days
- Rivaroxaban
  - 15mg twice/day x 21 days
    - With food
- Edoxaban
  - UFH or LMWH x 5-10 days
- Dabigatran
  - UFH or LMWH x 5-10 days

Primary Treatment

- Apixaban
  - 5mg twice/day
- Rivaroxaban
  - 20mg daily
    - With food
- Edoxaban
  - >60kg → 60mg daily
  - ≤60Kg → 30mg daily
- Dabigatran
  - 150mg twice/day

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Case 1: 55M with Isolated Distal DVT

- Patient preferred to start anticoagulation
  - Preferred DOAC
  - Apixaban based on insurance

- 3 months of AC in setting of strongly provoking transient risk factor

- Resolution of symptoms without recurrence

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Case 2: 47F HTN, HLD, Obesity s/p gastric sleeve

- 16 days ago: sleeve gastrectomy
- 8 days ago went to ER
  - Right calf pain/swelling
  - Acute non-occlusive left femoral to popliteal DVT
  - Rivaroxaban loading and DC home
- Now: worsening pain, swelling, discoloration, difficulty walking
- ROS:
  - Nausea, emesis, decreased PO

- Vitals: unremarkable
- Physical exam
  - 3+ edema ankle to thigh
  - Very tender
  - Bluish discoloration
  - Distal pulses weak

This presentation is concerning for?

A. Cellulitis
B. Anticoagulation Failure
C. DVT extension
D. Limb ischemia
E. B, C, D

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E. C, D

- **Symptoms now involve entire leg**
- **Significant pain, discoloration**
- **Present but weak distal pulses**
- Unable to take rivaroxaban with food
  - 700 calorie meal w/ 15mg & 20mg

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What is the next step?

A. Change anticoagulation
B. Tell patient to try to eat more
C. Advise on leg elevation
D. Compression Stockings
E. Send to ER

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Phlegmasia Cerulean Dolens

Extensive Thrombosis → Venous Hypertension → Arterial Compromise → Ischemia Gangrene → Compartment Syndrome → Shock, Limb Loss, Death

Epidemiology

- Rare
- Most often age 40-50s
- Slight more in males

Risk Factors

- Malignancy
- Hypercoagulable state
- Venous stasis
- Contraception/Pregnancy
- IVC filter, May-Thurner Syndrome
- Previous DVT
- Trauma

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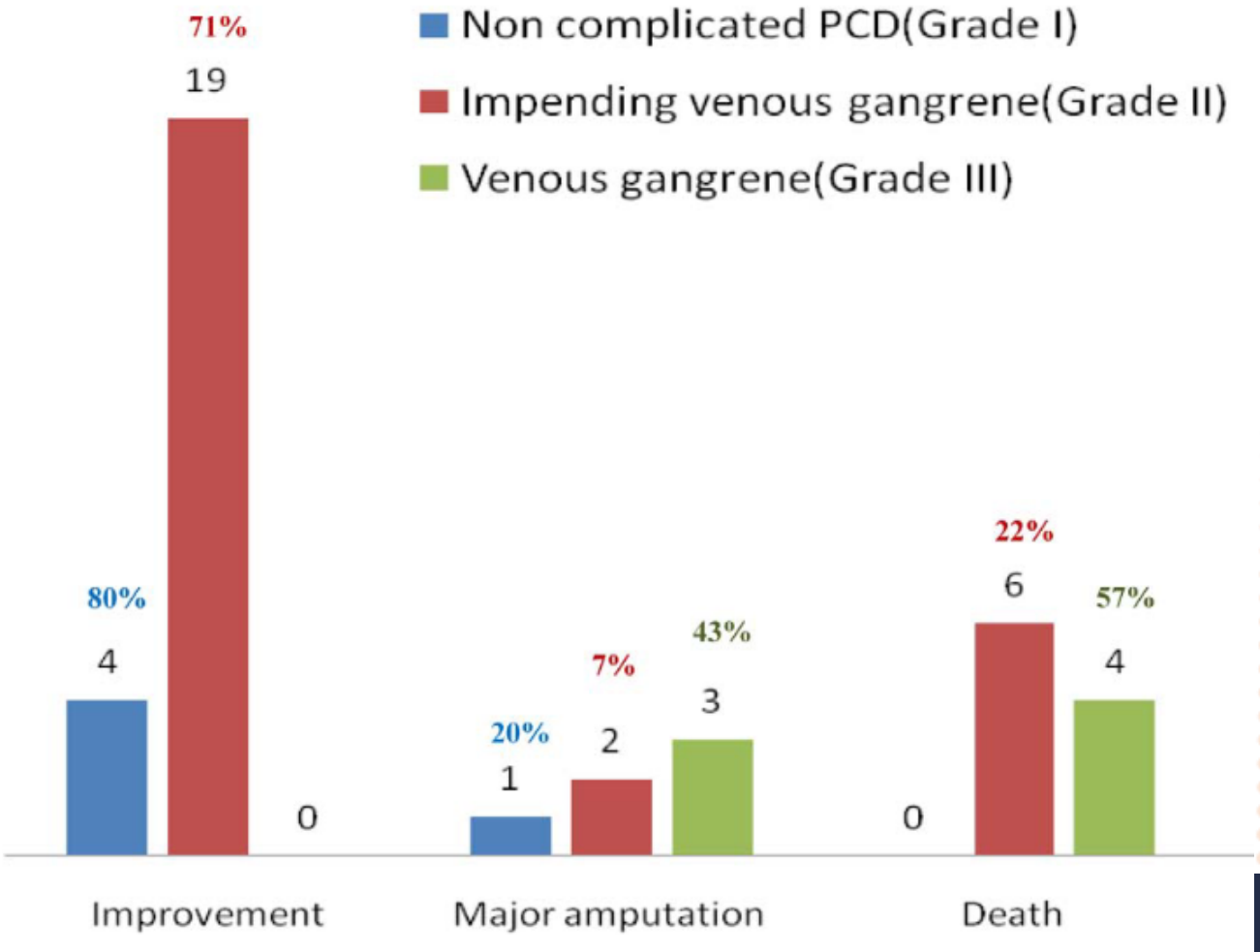
Severity	Cyanosis	Blistering Skin	Gangrene	Sensory-Motor Function	Palpable Distal Pulses
1 Noncomplicated PCD	Y	N	N	++	++
2 Impending venous gangrene	Y	Y	N	+	+
3 Venous gangrene					
A Toes or forefoot	Y	Y/N	Y	++/+/−	++/+/−
B Above ankle	Y	Y/N	Y	−	−



Medical Emergency

- Prompt anticoagulation
- Close monitoring
- Additional imaging/workup
- Catheter directed therapy
  - Lysis
  - Thrombectomy
- Fasciotomy

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Chinsakchai et al. Vasc Endovascular Surg. 2011;45(1):5-14

Case 1: 47F with Phlegmasia Cerulea Dolens

- Went straight to ER
- Started on therapeutic LMWH
- Venous duplex
  - Occlusive common femoral to posterior tibial/peroneal DVT
  - Significant soft tissue edema
- CT Venogram
  - Thrombus extension into left external iliac vein
  - May-Thurner Syndrome
- Consult for catheter based therapy
- Catheter directed lysis
- Stent in left common iliac vein
- Significant improvement in
  - Pain, swelling, color, mobility
- Discharged on LMWH --> VKA

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Society of Interventional Radiology Clinical Practice Guideline for Inferior Vena Cava Filters in the Treatment of Patients with Venous Thromboembolic Disease

Factors in favor

Acute proximal DVT :

- Contraindication to AC
- Poor cardiopulm status/reserve
- High risk procedure related PE
- VTE recurrence w/o issue related to AC

Factors against

- Small thrombus or distal DVT
- Short term AC contraindication
- Unknown clot acuity
- Received majority of the duration of AC before developing contraindication

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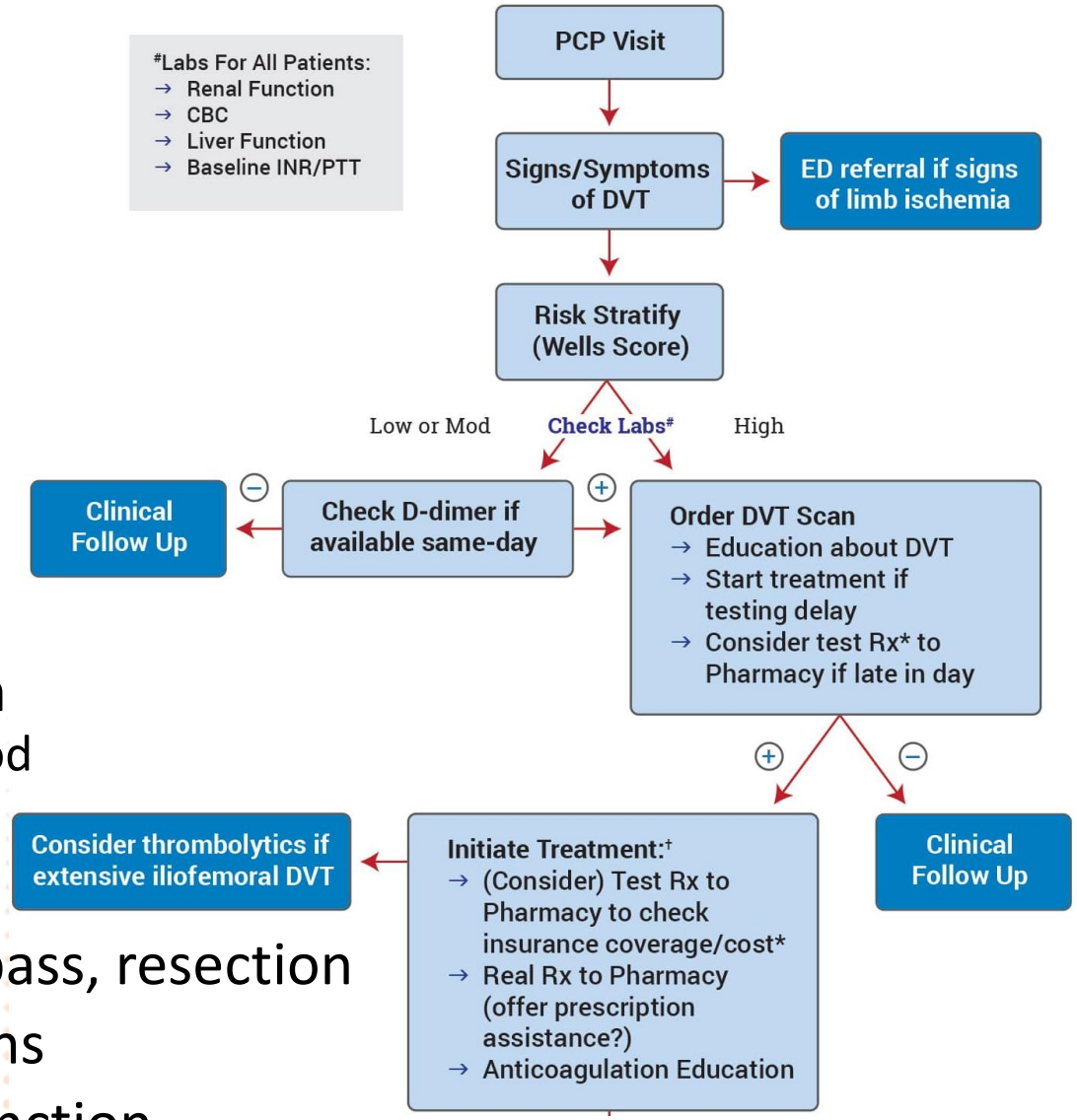
DOAC Considerations

- Cost
- Easier administration
- No monitoring
- No dietary restriction
  - ❖Rivaroxaban with food
- Lower bleeding risk
  - ❖GI/GU cancer
- ↓ absorption: GI bypass, resection
- Drug-Drug interactions
- Renal and liver dysfunction



Inpatient Management

- Limb threatened
  - Bluish discoloration/pallor
  - Pain
  - Motor or sensory deficits
  - Weak/absent pulse
- High bleeding risk
- Medication access issues
- Adherence issues
- Limited support at home

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https://mydeepveinthrombosis.com/