



Venous Thromboembolic Treatment Guidelines

About the NYU Venous Thromboembolic Center (VTEC)

- The center's mission is to deliver advanced screening, detection, care, and management services for patients experiencing a VTE in a fully integrated fashion.
- Multidisciplinary teams of clinicians and scientists from across the medical center are working together to streamline high-quality patient care, conduct innovative research, and become a premier resource of VTE education.
- The VTEC will help create evidenced-based practices and protocols for screening, preventing, diagnosing, and treating VTE to be used throughout the medical center to standardize superior patient care.

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Anticoagulation Guidelines for Lower Extremity DVTs

With the introduction of new oral anticoagulants (NOAC) there are now two pharmacologic pathways to treatment:

- LMWH or Fondaparinux recommended for initial anticoagulation (AC)
 - Continue for 5 days
 - Overlap with warfarin until INR 2.0-3.0
- Start warfarin on Day 1 of anticoagulation.
- New Oral Anticoagulants approved to treat acute DVT:
 - Apixaban (Eliquis)
 - Rivaroxaban (Xarelto)
- Dabigatran (Pradaxa) approved for use after 5-10 days of parenteral therapy.

Choice of therapy should be individualized based on risk/ benefit consideration

Distal Leg DVT (below knee)

- If Moderate- Severe Symptoms (pain, edema, warmth):
 - First occurrence: AC for **3 months**.
 - Recurrent: AC for **longer than 3 months (indefinite)**
 - If No (or very mild) symptoms present:
 - Generally recommend AC for **3 months**
 - Acceptable to forgo AC treatment if
 - NO risk factors for extension re present
- AND**
- Able to obtain serial dopplers over the course of 2 weeks.
 - Risk factors for extension include:
 - Positive D-dimer
 - DVT that is close to the proximal veins
 - Active malignancy
 - Previous blood clots
 - Inpatient status

Proximal Leg or IVC DVT

Should be treated with anticoagulants

- Thrombolysis or thrombectomy not routinely recommended (however, may consider catheter directed thrombolysis in extreme settings i.e. phlegmasia, or caval thrombosis)
- Outpatient treatment if feasible
- Treatment duration dependent on cause

Duration of AC:

- DVT triggered by surgery: **3 months**
- DVT due non-surgical risk factors (estrogen, long-distance travel, non-surgical hospitalization): **3 months**
- Unprovoked (idiopathic) DVT: **Long-term** (dependent on bleeding risk) Re-evaluation q 6 months. Consider hematology consult.

Upper Extremity DVT

- Similar recommendations regarding initiation of therapy as DVT (see slide 2)
 - First occurrence: **3 months**.
 - Recurrent: **Indefinite duration**
- Upper extremity DVT associated with a central venous catheter:
 - Continue catheter use if clinically indicated
 - AC as long as catheter in place.
 - AC for 3 months after catheter removed

Pulmonary Embolism Treatment

- *Anticoagulation* recommended (Guidelines on next series of slides)
- *Thrombolysis* recommended if:
 - PE and hemodynamic instability OR
 - Those with a PE, normotensive, but with the expectation to become hypotensive with subsequent PE (i.e. right heart strain on echo, poor pulmonary reserve)
- *Catheter thrombectomy or surgical embolectomy* recommended if:
 - Thrombolysis contraindicated
 - Failed thrombolytic
 - Clinically in shock

Anticoagulation Guidelines for PE

Initial therapy:

- AC with LMWH, Fondaparinux , IV Heparin, or SC Heparin
 - Minimum 5 days
 - Until INR is therapeutic at 2.0-3.0 for 24 hours
 - LMWH or Fondaparinux recommended over Heparin for treatment of PE in hemodynamically stable patients without renal failure.

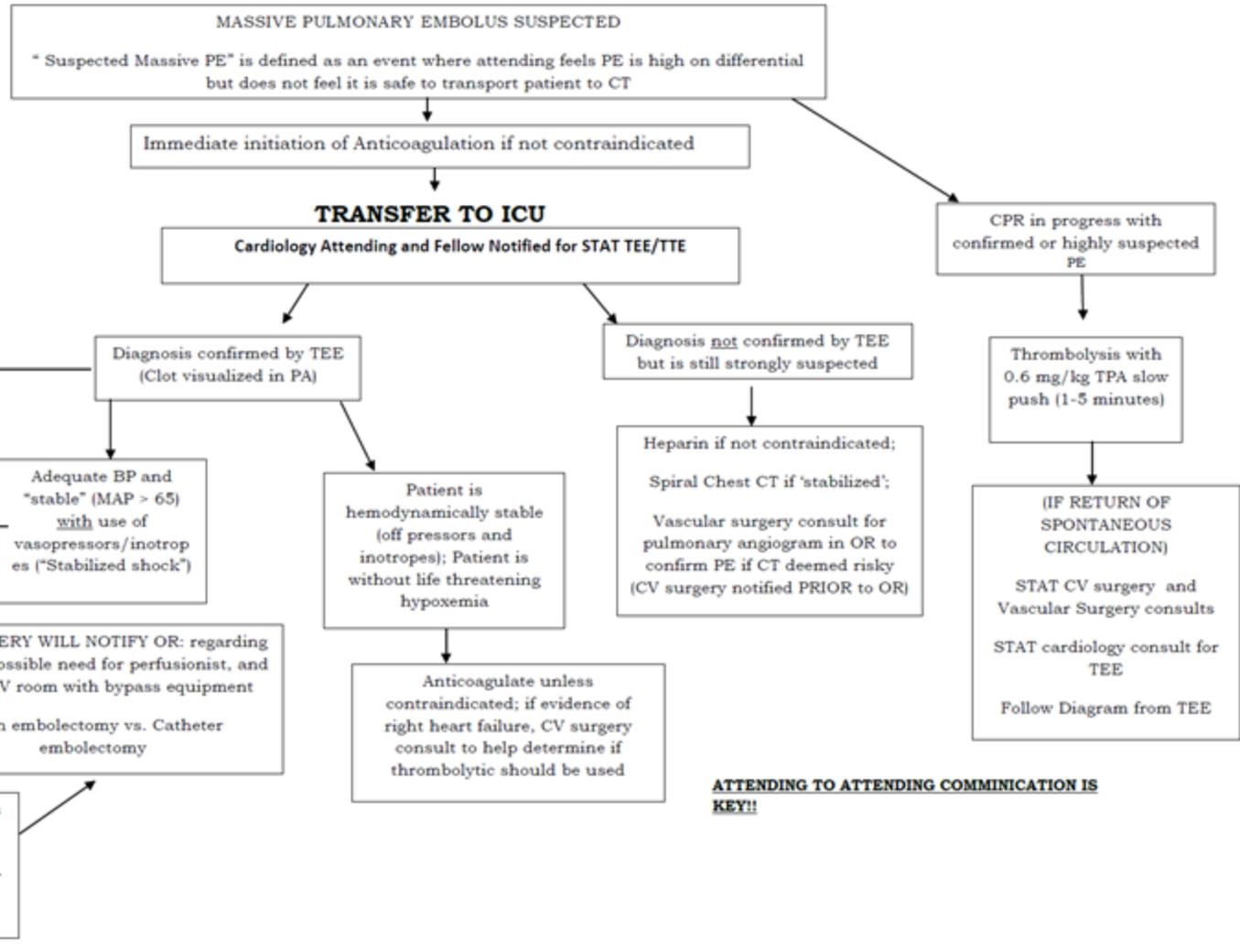
Start warfarin on Day 1 of anticoagulation.

- New Oral Anticoagulants approved to treat acute PE:
Apixaban (Eliquis)
Rivaroxaban (Xarelto)
- Dabigatran (Pradaxa) approved for use after 5-10 days of parenteral therapy.

AC treatment duration (similar principles to DVT):

- PE triggered by surgery: **3 months minimum (6 months if low bleeding risk)**
- PE due to a mild risk factor (I.e. non-surgical risk factors such as estrogen therapy, long-distance travel, non-surgical hospital stay, etc): **3 months minimum (6 months if low bleeding risk)**
- Unprovoked (idiopathic) PE: **long-term**, Reevaluate q 6 months. Consider hematology consult.

Massive PE guidelines



Incidentally Discovered DVT or PE

- Acute DVT (of the leg, arm, pelvis, or abdominal/splanchnic) or PE that was asymptomatic and incidentally discovered:
 - *Acute Asymptomatic* DVT of the Proximal Leg, Pelvis, or IVC : **AC as described previously**
 - *Asymptomatic* DVT in Abdomen (portal, splenic, mesenteric or hepatic vein thrombosis): *These DVT are often of unknown chronicity thus: AC only if clinically relevant*
 - *Acute Asymptomatic* PE:
 - Review CT to confirm PE - If uncertain confirm with other diagnostic modalities
 - If confirmed: **AC as described previously.**

Special Considerations

Bleeding Risk

- Consideration must be given to each individual's bleeding risk, especially for those needing long term AC. Risk factors for increased bleeding include:
 - Increased age (>75)
 - High Fall Risk
 - Uncontrolled hypertension
 - Polypharmacy- concomitant use of antiplatelet medications or NSAIDs
 - History of Bleeding

Cancer related DVT or PE

- Treat for at least 3 months and preferably long-term, unless bleeding risk is very high.
- Low molecular weight heparin is the preferred treatment, rather than warfarin.

Superficial Thrombophlebitis

- Superficial thrombophlebitis of the leg \geq 5cm
- AC recommended: Fondaparinux (preferred) or LMWH for 45 days

IVC Filters

- Can be used for those who cannot tolerate AC due to:
 - Active bleeding
 - High bleeding risk (including High Fall Risk)
 - Failed AC therapy
- Permanent IVC filter alone is not indication for AC
- Consider filter retrieval when feasible.

Prevention of Post-thrombotic Syndrome

- Post-thrombotic Syndrome can occur after a DVT and result in symptoms such as: chronic swelling, discomfort, discoloration, varicose veins, venous ulcerations, or cellulitis.

Prevention/ Treatment:

- Encourage ambulation/ exercise when feasible.
- Compression Stockings
 - Recommend use for 2 years post DVT to prevent or minimize the occurrence of post thrombotic syndrome.
- Venous interventions if necessary
 - Catheter directed thrombolysis may play a role in prevention

When to call a Hematology Consult

Indications for inpatient hematology consult

- AC in patients with active malignancy
- Pregnant patients
- Suspected Antiphospholipid Syndrome
- AC failure
- R/o Heparin induced thrombocytopenia
- Bridging AC prior to surgery or other invasive procedures.
- Significant blood count abnormalities
- Major bleeding complication

Outpatient

- Thrombophilia testing
- Long term AC management/duration
- Bridging AC prior to surgery or other invasive procedures.

References

- Ageno W., Gallus A., Wittkowsky A., Crowther M., Hylek E., Palareti G. (2012) *Oral anticoagulant therapy: antithrombotic therapy and prevention of thrombosis, 9th ed: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines*. Chest 141(Suppl. 2): e44S–e88S.
- Yeh, C., Gross, P., Weitz, J. (2014) *Evolving use of new oral anticoagulants for treatment of venous thromboembolism*. Blood 124 (7) 1020-128
- Valentine, K., Hull, R. (2014) *Anticoagulation in Acute Pulmonary Embolism*. Post TW (Ed), UpToDate, Waltham, MA. (Accessed on 22 September 2014).
- Lip, G., Hull, R. (2014) *Treatment of Lower Extremity Deep Vein Thrombosis*. Post TW (Ed), UpToDate, Waltham, MA. (Accessed on 22 September 2014).



VTE Treatment Guidelines in Pregnancy

Prenatal Treatment

- **For Acute VTE that occur during pregnancy:**
 - Recommend initiating treatment with therapeutic LMWH Enoxaparin (Lovenox)- 1mg/kg every 12 hours SC
- **For patients being treated for an Acute VTE who become pregnant:**
 - Recommend switching to LMWH once pregnancy confirmed
- **Retrievable IVC filters may be an option in pregnancy for women who have:**
 - Developed a VTE despite anticoagulation
 - Developed a complication of anticoagulation (ie significant bleeding)
- **Consider a Hematology consult for:**
 - Allergy to LMWH
 - Blood count abnormalities
 - Inherited or acquired thrombophilia

Considerations During Labor and Delivery

- UFH SC can be initiated as an alternative to LMWH at 36 weeks gestational age to facilitate labor/ delivery process (requires close monitoring)
- Hold LMWH 24 hours prior to scheduled delivery if feasible
- Therapeutic anticoagulation should be reinitiated 6 hours after vaginal delivery or 12 hours after cesarean section:
 - For this reason, neuraxial or epidural catheters should be discontinued not more than **two hours after vaginal delivery** and not more than **eight hours after cesarean delivery**, and alternative methods of pain control should be initiated.
 - *See Dept. of Anesthesia Anticoagulation Guidelines for Neuraxial or Peripheral Nerve Procedures for further advisement.*

Post-Partum Regimens:

- Treatment should last at least 6 weeks postpartum (and at least 3 months total)
 - Total treatment duration based on risk factors
- Warfarin or LMWH may be used postpartum and during lactation
 - During initiation of warfarin, LMWH should be used for at least the first five days and until INR reaches therapeutic level

Dosing guidelines for anticoagulant agents can be found at pharmacy.med.nyu.edu



Resources

- ACCP 2012 Chest Guidelines on Antithrombotic Therapy and Prevention of Thrombosis
- ACOG Guidelines (2011)
- UptoDate: DVT and PE in Pregnancy:Treatment (2014)