# CLINICAL PRACTICE GUIDELINES: MANAGEMENT OF VENOUS THROMBOEMBOLIC DISEASE AND INDICATIONS FOR VASCULAR SURGERY CONSULTATION

**Scope:**

The intent of these Clinical Practice Guidelines is to provide a concise summary of the principles regarding comprehensive management of deep venous thrombosis (DVT) and pulmonary embolism (PE). Most management recommendations are based on information in the Executive Summary of the 9th edition American College of Chest Physicians (ACCP) Evidence-Based Clinical Practice Guidelines for Antithrombotic Therapy and Prevention of Thrombosis [Chest 2012;141(2)(suppl):7S-47S], and in Antithrombotic Therapy for VTE Disease [Chest 2016; 149(2):315-352]. In addition to management recommendations, we have included recommendations for vascular surgery consultation.

These guidelines are intended for physicians and advance practice practitioners in both the outpatient and inpatient settings.

**Special Instructions:**

Treatment should be initiated within 2 hours of a positive DVT diagnosis.

## Initial Management of Acute DVT of the Lower Extremity:

Principles of management include early anticoagulation, compression stockings, elevation and early ambulation.

Anticoagulation: 3 primary options

1. Initial treatment with parenteral anticoagulation (low-molecular-weight heparin [LMWH], fondaparinux, IV unfractionated heparin [UFH] followed by vitamin K antagonist (VKA) therapy.
2. New guidelines suggest use of Novel Oral Anticoagulants (NOACs) over VKA for treatment of VTE without cancer. NOACs include Xarelto, Eliquis, and Pradaxa and all are approved by the FDA for treatment of VTE.
3. LMWH is recommended for VTE in patients with cancer and who fail standard treatment.

Compression Stockings:

1. Graduated compression stockings are not routinely recommended for patients with acute symptomatic DVT of the lower extremity.

2. Graduated compression stockings can be prescribed by any licensed healthcare provider. Because most Post-Thrombotic Syndrome (PTS) symptoms occur distal to the knee, most patients are prescribed knee-high stockings with 20-30 mm Hg compression. The only contraindication to compression stockings is severe peripheral arterial disease.
3. Thrombo-embolic deterrent (TED) hose are designed to prevent the development of DVT in immobile patients, and are not equivalent to graduated compression stockings.

Early Ambulation:

1. Early ambulation is recommended over bed rest in patients with acute DVT of the lower extremity.
2. Ambulation may be delayed in patients with severe edema and pain.

**Management of Isolated Distal DVT:**

1. Isolated Distal DVT (IDDVT) refers to DVTs of the deep veins distal to the popliteal veins and includes DVTs of the tibial veins and the intramuscular soleal and gastrocnemius veins. IDDVTs are more commonly diagnosed secondary to detail provided by contemporary ultrasound technology.
2. IDDVTs have up to 15% risk of propagation into the popliteal veins. Guidelines recommend either systemic anticoagulation for 3 months OR serial imaging at 1 and 2 weeks with duplex to rule out propagation into proximal veins. The guidelines specifically state that it is not acceptable to neither anticoagulate nor perform surveillance on patient's with IDDVT.
3. The decision for treatment or surveillance is based on clinical evaluation and the patient's ability to take anticoagulant medication or follow-up for surveillance ultrasound. Please see the aforementioned guidelines for more detail.

## Initial Management of Pulmonary Embolism:

Established pulmonary embolism: Immediate treatment with parenteral anticoagulation. Acute treatment with LMWH or fondaparinux is preferred over IV UFH.

High or intermediate clinical suspicion: Immediate treatment with parenteral anticoagulation while awaiting diagnostic tests.

Low clinical suspicion: Do not initiate anticoagulation until diagnostic tests are available, provided tests are expected within 24 hours.

Patients with shock or severe PE may benefit from thrombolytic therapy or thrombectomy (see below)

## Initial Management of Upper Extremity DVT:

Upper extremity DVT (UEDVT) is defined as deep venous thrombosis of the axillary vein or more proximal veins.

Anticoagulation: Acute treatment with LMWH or fondaparinux over IV UFH with transition to VKA or NOAC without LMWH.

## Upper Extremity DVT and Associated Central Venous Catheter:

A central venous catheter can be left in place in patients with an associated UEDVT if the catheter is functional and there is an ongoing need for the catheter. Otherwise, the catheter should be removed.

Risk of shearing clot from the end of the catheter is low and removal of a catheter with an associated UEDVT does not require specific precautions provided the patient is on therapeutic anticoagulation.

## Management of Greater Saphenous Vein (GSV) or Small Saphenous Vein (SSV) Thrombosis:

The American College of Chest Physicians recommends either anticoagulation or surveillance duplex within 72 hours in patients with superficial thrombophlebitis of the GSV or SSV if the thrombus is "near" (5 cm) the saphenofemoral junction (SFJ) or saphenopopliteal junction (SPJ), respectively. The definition of "near" is not clarified in the guidelines, but the most conservative definition is within 5cm of the respective junction with the underlying deep veins.

Thrombophlebitis that abuts the SFJ or SPJ should be treated with anticoagulation.

Standard thrombophlebitis treatment (activity, compression and NSAIDs) is recommended if anticoagulation is not initiated.

## Indications for Thrombolytic Therapy and Interventional Management for DVT and PE:

The intent of a successful thrombus removal strategy in patients with DVT is to improve quality of life by decreasing the risk of PTS and the risk of recurrent DVT. Patients with iliofemoral DVT (referred to as "proximal DVT" in the ACCP

Guidelines) are at highest risk for PTS. Some patients with common femoral vein and profunda femoris vein occlusion will have symptoms that warrant consideration of a thrombus removal strategy. Thrombus removal strategies have the advantage of decreased complications from systemically administered thrombolysis and decreased length of stay. The major disadvantage is cost.

Risk assessment for contraindications to thrombolysis is a critical component of the evaluation in candidates for thrombus removal. Well-accepted contraindications include: recent surgery (1-2 weeks), pregnancy, previous GI bleed, severe hypertension, and stroke within 2 months.

Strategies include:

1. Intrathrombus catheter-directed thrombolysis (CDT): Technique involves placement of a catheter into the thrombus and a slow infusion (1-2mg/hour) of thrombolytics over a 12-24 hours period. This technique requires an ICU environment for monitoring for bleeding complications.

2. Pharmacomechanical thrombectomy (PMT): Technique involves removal of thrombus with catheters. This technique often involves infusion of thrombolytics into the thrombus. The thrombolytic is allowed to infuse for 13-30 minutes before removal. This technique may be preferred when patients have contraindications for prolonged thrombolytic infusion, and the technique is often combined with CDT to maximize thrombus clearance.

3. Operative thrombectomy

<u>Lower Extremity DVT:</u>

The ACCP guidelines recommend anticoagulation therapy alone over CDT or systemic thrombolytics.

The guidelines state that patients who are most likely to benefit from CDT are likely to choose a thrombus removal strategy if they place a high value on the prevention of PTS.

Patient who are most likely to benefit from systemic thrombolytics are likely to choose this technique if they do not have access to CDT and they place a high value on the prevention of PTS.

Patients with severe symptoms and outflow occlusion of the venous system should be considered for either PMT or CDT by a provider experienced in these techniques.

Pulmonary Embolism:

ACCP guideline summary:

1. The ACCP Guidelines recommend against systemic thrombolysis in patients with acute PE not associated with hypotension.
2. The ACCP Guidelines suggest systemic thrombolysis in patients with acute PE and hypotension (SBP < 90 mm Hg). The guidelines suggest short infusion times (2 hours) through a peripheral IV over a pulmonary artery catheter.
3. In patients with shock that is likely to cause death before thrombolysis can take effect, the guidelines suggest PMT or surgical embolectomy as the initial treatment of PE.

Treatment of PE with thrombolytics and thrombus removal strategies is a controversial and evolving concept.

PEs can be broadly classified into 3 groups:

1. No hemodynamic instability or evidence of right heart strain on Echo.
2. Submassive PE: central thromboembolic perfusion with right ventricular strain without hypotension.
3. Massive PE: systemic hypotension (<90 mm Hg), drop in systolic pressure > 40 mm Hg, syncope, or cardiac arrest.

There is a growing body of literature on how to best treat the patient with submassive PE. The goal of treatment is to decrease mortality and the long-term morbidity of chronic thromboembolic pulmonary hypertension. These complications are higher in submassive PE than in patients without right heart strain. Please see Care Guideline for Recommendations for the Management of Massive and Submassive Pulmonary Embolism in Adult Patients.

Most facilities that employ an aggressive treatment strategy for submassive PEs use echocardiogram or CT Angio as the test to determine if there is evidence of right heart strain.

We believe the best approach to the submassive PE is a multidisciplinary approach between a pulmonologist and a provider experienced in the aforementioned thrombus removal techniques. Please see Care Guideline for Recommendations for the Management of Massive and Submassive Pulmonary Embolism in Adult Patients.

Upper extremity DVT (UEDVT):

The ACCP guidelines suggest anticoagulant therapy alone over thrombolysis in patients with UEDVT that involves the axillary or more proximal veins.

The guidelines state that patients who are most likely to benefit from thrombolysis with access to DVT and who attach a high value to the prevention of PTS are likely to choose thrombolysis over anticoagulation alone.

As with LEDVT and PE, the clinical evaluation by someone experienced in interventional management is a critical component of the decision to initiate CDT or PMT.

## Vena Cava Filters for Management of DVT and PE:

Evidence-based guidelines exist for Vena Cava filter placement in the following situations:

- Documented VTE with contraindication to anticoagulation
- Documented VTE with complications of anticoagulation
- Recurrent PE despite therapeutic anticoagulation
- Documented VTE with inability to achieve therapeutic anticoagulation

Relative expanded indications with inconclusive supportive evidence include:

- Poor compliance with anticoagulation
- Free-floating iliocaval thrombus
- Documented PE with limited cardiopulmonary reserve
- Recurrent PE documented by pulmonary hypertension
- Documented VTE in:
  - Cancer patients
  - Burn patients
  - Pregnancy
- VTE prophylaxis in:
  - High-risk surgical (including trauma) patients
  - High-risk medical patients

A permanent IVC filter, of itself, is not an indication for extended anticoagulation.

New guidelines discourage IVC filter use in anticoagulated patients.

## Length of Anticoagulation Treatment:

The ACCP guidelines recommend systemic anticoagulation for 3 months for the majority of provoked DVTs and PEs. The major exception is in patients with cancer.

Unprovoked DVTs with low to moderate bleeding risk should be considered for extended therapy.

Unprovoked DVTs with high bleeding risk should be treated with 3 months of anticoagulation therapy unless that patient has cancer.

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| | Patients with LMWH with cancer should be considered for extended anticoagulant therapy.<br><br>Decision to work-up for hypercoagulable states should be in patients with unprovoked VTE and patients with VTE and family history of thrombophilic states. Subspecialty consultation is appropriate prior to ordering this work-up, which can result in costly and unnecessary tests if done without such consultation.<br><br>**There is limited to no role of surveillance of DVT with ultrasound in determining length of treatment. The primary role of ultrasound is in the initial diagnosis of DVT and for worsening or recurrent symptoms. The majority of post-DVT ultrasounds is persistently abnormal and has no influence on the decision to continue or discontinue therapeutic anticoagulation.**<br><br>## Role of Vascular Surgery Consultation:<br><br>These clinical practice guidelines are provided as a resource to facilitate efficient patient care for the majority of patients with venous thromboembolism.<br><br>The Vascular Surgery Service has an on call physician available 24/7 to provide clarification on these issues.<br><br>The primary role for formal vascular surgery consultation is in patients whom the referring provider believes may be a candidate for interventional management. The vascular surgery service recognizes that there are other specialties with interventional expertise in VTE patients.<br><br>In the majority of cases, the patient's primary care provider will provide outpatient management of VTE.<br><br>**Patients seen in the emergency room that do not have a primary care provider should be provided with resources to obtain a primary care provider for the patient's follow-up and follow-up with the vascular surgery service. Vascular Surgery is developing a process for Urgent Care Clinics and the Emergency Rooms to schedule these immediate follow up appointments.** |
| | **Related Policies: N/A** |
| | **Related Standard Workflows:** Care Guideline - Recommendations for the Management of Massive and Submassive Pulmonary Embolism in Adult Patients |
| | **Related Forms: N/A** |

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| | **References:**<br>Executive Summary of the 9th edition American College of Chest Physicians (ACCP) Evidence-Based Clinical Practice Guidelines for Antithrombotic Therapy and Prevention of Thrombosis [Chest 2012;141(2)(suppl):7S-47S]<br><br>Antithrombotic Therapy for VTE Disease [Chest 2016; 149(2):315-352] |
| | **Point of Contact:**<br>Chatt Johnson, Vascular Surgeon, 253-403-8410/253-305-1153 |

| ***Approval By:*** | ***Date of Approval:*** |
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