Venous Thromboembolism and Heart Failure: 
Current Clinical Practice Guidelines

Combined Sections Meeting 2015
Indianapolis, Indiana, February 4 – 7, 2015
Friday, February 6, 2015 at 3:00 PM - 5:00 PM
Indiana Convention Center, Room 209

Presenters:
Sean Collins, PT, ScD - University of Mass At Lowell, Lowell, Massachusetts
Ethel Frese, PT, DPT, MHS, CCS - St Louis University, St Louis, Missouri
John Heick, PT, DPT, OCS, NCS - Arizona Still, Phoenix, Arizona
Ellen Hillegass, PT, PhD, CCS, FAPTA - Mercer University, Atlanta, Georgia
Michael Puthoff, PT, PhD, GCS - St Ambrose University, Davenport, Iowa
Dennis Sobush, PT, MA, DPT, CCS, CEEAA – Marquette University, Milwaukee, Wisconsin
Mary Thigpen, PT PhD - Brenau University, Gainesville, Georgia

Disclosure – No speaker has relevant financial relationships that could reasonably be viewed as creating a conflict of interest, or the appearance of a conflict of interest, that might bias the content of the presentation

Learning Objectives:
1. List and describe major steps in the clinical practice guidelines (CPG) process.
2. Identify tools available in the CPG development process and the role the APTA can have in assisting in the process.
3. Describe the strengths and limitations of CPGs.
4. Apply the preliminary recommendations of the venous thromboembolism CPG to a patient.
5. Discuss evidence to support clinical decisions on mobility of individuals diagnosed with a lower extremity deep vein thrombus based on recommendations from the CPGs.
6. Discuss preliminary findings of evidence on exercise and heart failure.
7. Identify ways individuals can contribute to the CPG development process based on their education, clinical expertise, and time availability.
Background on Clinical Practice Guidelines

Clinical practice guidelines (CPG) are statements that include recommendations intended to optimize patient care. The recommendations are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options.

Ideally CPGs improve clinical practice and patient care by highlighting areas where there is strong evidence. A CPG may lack sufficient evidence or the balance between benefits and harms is close to make a strong recommendation. A CPG should assist in decision making, not replace the critical thinking of the clinician. A CPG may help guide the decision making process of healthcare policy makers, third party payers and patients. A CPG also can identify areas that are well researched as well as topics where additional research is lacking.

Knowledge Translation in Healthcare

Knowledge translation is a dynamic and iterative process that includes the synthesis, dissemination, exchange and ethically sound application of knowledge to improve health, provide more effective health services and products and strengthen the healthcare system. The below figure shows the Knowledge to Action Cycle. This cycle demonstrates how knowledge can be brought to clinical practice. Knowledge translation goes beyond just dissemination of knowledge. It is about clinicians finding and then using knowledge to benefit the patient at the local level. Clinical practice guidelines are tools that help translate knowledge to clinical practice.
Process of CPG Development\textsuperscript{1,4}

1. Establish a multidisciplinary team to address the topic
2. Identify the clinical question(s)
3. Conduct a systematic review of evidence
4. Appraise and interpret evidence and come to consensus on it meaning
5. Draft guideline recommendations that align with the evidentiary base
6. Complete an external review of the draft report among intended users and key stakeholders
7. Revise the guidelines in response to the external review
8. Read the final guideline report for distribution and dissemination
9. Prepare an implementation strategy.

Efforts in the American Physical Therapy Association to Create CPG\textsuperscript{5}

The APTA has started a process to develop clinical practice evidence based documents. The goal is to reduce unwarranted care and focus payment in the right areas. The APTA is committed to and provides financial support for the writing groups, workshops on the process and some mentoring. Currently there are 33 different groups working on CPG within the APTA.

Venous Thromboembolism Clinical Practice Guideline Update

A guideline development group (GDG) was appointed by the Cardiovascular and Pulmonary and the Acute Care Sections to develop a guideline to address the physical therapy role in the management of VTE, specifically addressing the role of mobility as this was identified as a major issue facing both sections. In July 2012 the GDG initiated the process under the guidance of the APTA and developed a list of topic areas to be covered by the CPG in addition to soliciting topic areas from identified clinicians with specific content and clinical expertise in the area of VTE.

The overall objective of this CPG is to provide physical therapists with the best evidence in preventing VTE, screening for LE DVT, mobilization of patients with LE DVT and management of complications of LE DVT. Specifically the CPG will address the following areas:

- Discuss the role of physical therapists in identifying patients who are at high risk for a VTE and actions that can be taken to decrease the risk for a first or reoccurring VTE.
- Provide physical therapists with specific tools to identify patients who may have a LE DVT and determine the likelihood of a LE DVT.
- Assist physical therapists in determining when mobilization is safe for a patient diagnosed with a LE DVT based on the treatment chosen by the interprofessional team.
- Describe interventions that will decrease post diagnosis complications such as Post-Thrombotic Syndrome or another VTE.
Create a reference publication for healthcare providers, patients, families/caretakers, educators, policy makers, and payers on the best current practice of physical therapy management of patients at risk for VTE or diagnosed with a LE DVT.

Identify areas of research that are needed to improve the evidence base for physical therapy management of patients with potential or diagnosed VTE.

The focus of this CPG is adult patients across all practice settings, but does not address or apply to those who are pregnant or to children. Additionally this guideline does not discuss the management of pulmonary embolism (PE), upper extremity DVT (UE DVT) or chronic thromboembolism pulmonary hypertension (CTEPH).

Background on VTE

VTE consists of three interrelated primary conditions caused by venous blood clots:

1. Deep vein thrombosis – Blood clot forms in a deep vein, most commonly in the calf, thigh, or pelvis.
2. Pulmonary embolism – When a clot dislodges, travels through the venous system and causes a blockage in the pulmonary circulatory system.
3. Post thrombotic syndrome – A clot remains in the leg’s vein obstructing blood flow leading to venous hypertension, damage to the vein and compromised return of venous blood flow.

VTE is a life-threatening disorder estimated to affect approximately 1 per 1000 Americans a year which ranks as the third most common cardiovascular illness after acute coronary syndrome and stroke.

Across various practice settings, physical therapists encounter patients who are at risk for VTE, may have an undiagnosed DVT, or have recently been diagnosed with a DVT. The physical therapist’s responsibility to every patient is four-fold:

1. Prevention of VTE
2. Screening for DVT
3. Contributing to the healthcare team in making prudent decisions regarding safe mobility for these patients
4. Prevention of long term consequences of DVT

It is essential that physical therapists work within their healthcare system and with the interprofessional team to fulfill these responsibilities.
Work Done to Date on VTE CPG

1. Establish a multidisciplinary team to address the topic
   a. Physical therapists comprise the GDG. Members are clinical experts, faculty in professional and residency programs, textbook authors, manuscript reviewers, and individuals who have experience in writing and interpreting of the literature.

2. Identify clinical question
   a. Based on the breadth of information, a decision was made to not address screening for or management of upper of extremity deep venous thrombus (DVT) or pulmonary embolism.
   b. The focus of this CPG is on prevention of VTE, screening for and managing lower extremity DVT and management of long term complications post VTE.

3. Conduct a systematic review of evidence
   a. Through the assistance of an university-based librarian, 26 other CPG were reviewed using the AGREE II Tool.
   b. Over 8600 articles related to VTE were found and logged into a database for consideration.

4. Appraise and interpret evidence and come to consensus on it meaning
   a. AGREE II For Clinical Practice Guidelines Review
   b. AMSTAR Tool for Systematic Reviews
   c. Appraisal Tool for Prognosis Studies
   d. Appraisal Tool for Diagnosis Studies
   e. Appraisal of Applicability and Quality

5. Draft guideline recommendations that align with evidentiary base
   a. Key action statements have been written and agreement on the level of evidence and recommendation of the strength of the evidence were determined through a Delphi Process.

6. Complete an external review of draft report among intended users and key stakeholders
   a. A draft of the CPG has been shared for review with key stakeholders.

7. Revise the guidelines in response to external review
   a. The GDG will be revising the CPG based on feedback from reviewers.

8. Read the final guideline report for distribution and dissemination
   a. The CPG will be submitted to the Physical Therapy Journal for review and possible publication.
9. Prepare implementation strategy.
   a. Preliminary sharing of CPG recommendations at Combined Sections Meeting 2015.
   b. Open access to the CPG and all reference materials.
   c. Creation of Pocket Guide for physical therapist about VTE.
   d. Creation of patient brochures and information flyers about the role of physical therapists in preventing VTE and managing patients with LE DVT.
   e. Production of podcasts about the CPG aimed at physical therapists.
   f. Presentations on the CPG by the GDG at regional seminars.
   g. Recorded presentations on the CPG by the GDG.

Key Action Statements

<table>
<thead>
<tr>
<th>Number</th>
<th>Statement</th>
<th>Evidence Quality</th>
<th>Rec. Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Physical therapists should advocate for a culture of mobility and physical activity unless medical contraindications for mobility exist. (Evidence Quality: I, Rec. Strength: Strong)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>During the initial patient interview and physical examination, physical therapists should determine if the patient is in the high risk population for LE DVT. (Evidence quality: I ; Rec. Strength: Strong)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Physical therapists should recommend preventive measures for LE DVT for patients who are identified as high risk for LE DVT. These measures should include education regarding signs/symptoms of LE DVT, activity, hydration, mechanical compression and referral for medication. (Evidence Quality: I, Rec. Strength: Strong)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Physical therapists should recommend mechanical compression (e.g., intermittent pneumatic compression &amp;/or graduated compression stockings) when individuals are at high risk for LE DVT.  (Evidence Quality: I, Rec. Strength: Strong )</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Physical therapists should assess patients for presence of signs/symptoms of LE DVT.  (Evidence quality: I; Rec. Strength: Strong)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Physical therapists should establish the level of risk for the presence of LE DVT AND physical therapists should recommend further medical testing to rule out LE DVT prior to mobilization if/when/whenever a patient demonstrates signs/symptoms of LE DVT including pain, tenderness, swelling, warmth and/or redness/discoloration  (Evidence quality: I; Rec. Strength: Strong)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>When a patient has a recently diagnosed LE DVT physical therapists should verify if the patient is taking an anticoagulant medication, what type of anticoagulant medication, and when the anticoagulant medication was initiated. (Evidence Quality: V; Rec. Strength: Theoretical/foundational)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>When a patient has a recently diagnosed LE DVT Physical therapists should initiate mobilization when therapeutic threshold levels of anticoagulants have been reached (Evidence Quality: I, Rec. Strength: Strong)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Physical therapists should recommend mechanical compression(e.g., intermittent pneumatic compression &amp;/or graduated compression stockings) when a patient has a LE DVT (Evidence Quality: II, Rec. Strength: Moderate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Physical therapists should recommend patients post IVC filter placement be mobilized once medically stable (Evidence quality: V; Rec. Strength: Best Practice)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>When a patient with a documented LE DVT (VTE) below the knee is NOT treated with anticoagulation and does NOT have an IVC filter and is prescribed out of bed mobility by the physician, the physical therapist should use clinical judgment with regard to mobilizing versus keeping the patient on bed rest. (Strength of evidence V; Rec. Strength: Best Practice)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Physical therapists should screen for fall risk whenever a patient is taking an anticoagulant medication. (Evidence Quality: III , Rec. Strength: Best Practice)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Physical therapists should recommend Mechanical Compression (e.g. intermittent pneumatic compression &amp;/or graduated compression stockings) when a patient has signs &amp;/or symptoms suggestive of Post-Thrombotic Syndrome (PTS). (Evidence quality: I, Rec Strength: Strong)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Physical therapists should conduct screening for VTE (e.g. LE DVT) when a recurrence is suspected and provide treatment (eg early mobilization with or without Mechanical Compression) when a recurrent VTE is confirmed/diagnosed once the patient is adequately anticoagulated if appropriate. (Evidence quality: V; Rec. Strength: Best Practice)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Algorithms**

As part of the CPG, the GDG has developed algorithms to help clinicians utilize the key action statements. The algorithms also reference tables to help provide an overview of the evidence in an easy to read and clinically applicable manner.

**Algorithm 1: Screening for Risk of Venous Thromboembolism**

![Algorithm Diagram]

**Table 1: Risk Factors for DVT**

- Previous venous thrombosis or embolism
- Age, over 55-60 years
- Active cancer or cancer treatment
- Severe infection
- Oral contraceptives, hormonal replacement therapy
- Pregnancy or given birth within the previous six weeks
- Immobility (bed rest, flight travel, fractures)
- Surgery, anesthesia
- Critical care admission, central venous catheters
- Inherited thrombophilia
- Obesity
- One or more significant medical comorbidities (for example: heart disease; metabolic, endocrine or respiratory pathologies; acute infectious diseases; inflammatory conditions, peripheral arterial insufficiency)
### Table 6: The Padua Score for Assessing VTE Risk in Hospitalized Patients

<table>
<thead>
<tr>
<th>Baseline Features</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active cancer*</td>
<td>3</td>
</tr>
<tr>
<td>Previous VTE (exclusion of superficial vein thrombosis)</td>
<td>3</td>
</tr>
<tr>
<td>Reduced mobility ^</td>
<td>3</td>
</tr>
<tr>
<td>Already known thrombophilic condition #</td>
<td>3</td>
</tr>
<tr>
<td>Recent (&lt; 1 month) trauma and/or surgery</td>
<td>2</td>
</tr>
<tr>
<td>Elderly age (&gt; 70 years)</td>
<td>1</td>
</tr>
<tr>
<td>Heart and/or respiratory failure</td>
<td>1</td>
</tr>
<tr>
<td>Acute myocardial infarction or ischemic stroke</td>
<td>1</td>
</tr>
<tr>
<td>Acute infection and/or rheumatologic disorder</td>
<td>1</td>
</tr>
<tr>
<td>Obesity (BMI &gt; 30 kg/m²)</td>
<td>1</td>
</tr>
<tr>
<td>Ongoing hormonal treatment</td>
<td>1</td>
</tr>
</tbody>
</table>

**High risk > 4**

* Patients with local or distant metastases and/or in whom chemotherapy or radiotherapy had been performed in the previous 6 months
^ Bedrest with bathroom privileges (either due to patient’s limitations or on physician’s orders) for at least 3 days
# Carrier of defects of antithrombin, protein C or S, factor V Leiden, G20210A prothrombin mutation, antiphospholipid syndrome

### Table 7 Interventions to Decrease the Risk of DVT

- Leg exercises such as ankle pumps
- Ambulation as soon as possible
- Hydration
- Correct use of compression stockings or mechanical compression devices (14-15 mmHg) unless contraindicated
- Refer for possible pharmacological prophylaxis

### Table 9 Education Topics for Patients at High Risk for DVT

- Risk factors for DVT
- Possible consequences of DVT
- Interventions to decrease the risk of DVT
- Signs/symptoms of VTE/DVT and importance of seeking medical help if suspect VTE/DVT
- Importance of follow-up monitoring
- Importance of compliance
- Medication issues e.g. regimen, adverse side effects and interactions, dietary restrictions
Algorithm 2: Determining Likelihood of a Lower Extremity Deep Vein Thrombus

Does the patient have signs and/or symptoms of a LE DVT? (Table 10)

NO

Continue to encourage mobility and physical activity in addition to any additional preventive interventions

YES

Assess DVT likelihood using the Wells’s Criteria for DVT (Table 11)
Communicate signs and symptoms along with results of Wells to medical team

Was a diagnostic test for DVT performed?

YES

If negative, encourage mobility and physical activity
If positive, go to Algorithm 3

NO

Use clinical judgment regarding mobilization

Table 10 – Signs and Symptoms of a LE DVT

Pitting edema
Tenderness and pain in leg
Erythema
Warmth
Swelling of the leg
Prominent superficial veins
### Table 11: Two-Level DVT Wells Score\(^{21}\)

<table>
<thead>
<tr>
<th>Clinical Feature</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active cancer (treatment ongoing, within 6 months, or palliative)</td>
<td>1</td>
</tr>
<tr>
<td>Paralysis, paresis or recent plaster immobilisation of the lower extremities</td>
<td>1</td>
</tr>
<tr>
<td>Recently bedridden for 3 days or more or major surgery within 12 weeks requiring general or regional anaesthesia</td>
<td>1</td>
</tr>
<tr>
<td>Localised tenderness along the distribution of the deep venous system</td>
<td>1</td>
</tr>
<tr>
<td>Entire leg swollen</td>
<td>1</td>
</tr>
<tr>
<td>Calf swelling at least 3 cm larger than asymptomatic side</td>
<td>1</td>
</tr>
<tr>
<td>Pitting edema confined to the symptomatic leg</td>
<td>1</td>
</tr>
<tr>
<td>Collateral superficial veins (non-varicose)</td>
<td>1</td>
</tr>
<tr>
<td>Previously documented DVT</td>
<td>1</td>
</tr>
<tr>
<td>Alternative diagnosis at least as likely as DVT</td>
<td>−2</td>
</tr>
</tbody>
</table>

**Clinical probability simplified score**

| DVT ‘likely’                                                                     | 2 points or more |
| DVT ‘unlikely’                                                                   | Less than 2 points |
Algorithm 3: Mobilizing Patients with Known Lower Extremity Deep Vein Thrombus

Are they anticoagulated?

Yes

LMWH

Is patient on preventive dose and new DVT?

Yes

Wait for higher dose to be given

Wait for dose to be given

< 3 hrs – No mobility

3-5 hrs – Check with physician

> 5 hrs – Mobilize

No

Time since administration

< 3 hrs – No mobility

3-5 hrs – Check with physician

> 5 hrs – Mobilize

Fondaparinux

Time since administration

< 2 hrs – No mobility

2-3 hrs – Check with physician

> 3 hrs – Mobilize

UFH

Time since administration

< 24 hrs – No mobility

24-48 hrs – Check with physician

> 48 hrs – Mobilize

NOAC

Time since administration

< 2 hrs – No mobility

2-3 hrs – Check with physician

> 3 hrs – Mobilize

Coumadin¹

INR Levels

INR < 2 - No mobility

INR 2-5 - Mobilize

INR > 5 – Check with physician

No

Do they have an IVC filter?

Yes - Mobilize

No - Check with physician

LMWH – Low Molecular Weight Heparin
UFH – Unfractionated Heparin
NOAC – Novel Oral Anticoagulants
INR – International Normalized Ratio
IVC – Inferior Vena Cava

¹ If started on Coumadin, LMWH usually also started. Use LMWH guidelines for mobilization decision in these situations.
Physical Therapy for Adults Following Acutely Decompensated Chronic Heart Failure:

Supporting Section: Cardiovascular and Pulmonary

Guideline Development Committee
Sean Collins, PT, ScD
John Heick, PT, DPT, OCS, NCS
Kristin Lefevbre, PT, PhD, CCS
Michael Shoemaker, PT, PhD, CCS
Larry Cahalin, PT, PhD, CCS

Evidence-based clinical practice guideline (CPG) for physical therapy clinical decision making and intervention in adults with chronic heart failure (HF)

Two questions:
Is it safe to proceed with physical therapy at this time?
• address recommendations related to a patient’s readiness
• particularly important for patients following an acutely decompensated HF
• include recommendations on criteria to determine what interventions a patient is ready for at various stages in their condition

If the patient is ready for physical therapy, what interventions are recommended?
• address which interventions are recommended for a patient with chronic heart failure
• include recommendations regarding physical therapy interventions across the spectrum of the condition and the continuum of care (acute care through outpatient settings)

Despite an estimated 277 CPGs with the key word “heart failure” there are none that specifically address readiness or physical therapy intervention
There are several systematic reviews (with and without meta analysis) available on the topic of exercise intervention for patients with HF, and several of the CPGs on HF address the use of exercise as a management strategy for HF in patients that are clinically stable for the purpose of reducing morbidity and mortality.

Why Heart Failure?
• HF is a condition of national priority due to its high and predicted escalations in prevalence and cost, with HF being a major cause of hospitalization and hospital readmission nationwide. Payment policies now consider readmissions as preventable. Hospital systems highly value contributions from any discipline that can reduce readmission rates.
• Physical Therapist clinical decision making regarding the safety and effectiveness of implementing intervention for adult patients with HF is generally considered a topic of great confusion among physical therapists in different care settings (e.g. hospital, SNF, home care)
Approach / Methodology are based on three primary sources:

1. Guidelines International Network (G-I-N)
2. AGREE II (Appraisal of Guidelines, Research and Evaluation)
3. Kaplan et al’s special communication in Pediatric Physical Therapy

These three sources compliment one another and provide the necessary breadth and depth. The Kaplan et al special communication was critical for addressing specific concerns related to CPG development for physical therapy.

The presentation will summarize key planning stages for the development of this CPG, including:

1. Proposed Timeline
2. Evidence Selection Criteria
3. Searching the literature - comparison between evidence selection and librarian generated search strategies
4. Critical appraisal of evidence
5. Data extraction and presentation
6. Synthesizing and interpreting the evidence
7. Developing recommendations
8. Final Report Writing
**Ways to Get Involved in the CPG Process**

- Work with individual APTA sections to volunteer time in the CPG development process
  - Appraise studies and other CPG
  - Membership in the GDG
  - Review drafts of CPG as a stakeholder
  - Comment during the open review period
- Stay up to date on new CPG
- Be a clinical champion and apply the recommendations of the CPG to your local context
- Provide feedback on strengths and weaknesses of current CPG
- Use CPG to guide research agendas
References


