

Diagnosing and Treating DVT from your Office; A Practical Approach

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Learning Objectives: To Review:

- The presentation, prognosis, diagnosis and treatment of DVT
- The calculation of pre-test probability of DVT
- The latest strategies for imaging suspected DVT
- An evidenced based strategy for the management of proven DVT

Outline

- Introduction
- Pre-Test Probability
- Diagnostic Imaging
- Whole blood D-dimers
- Diagnostic protocols
- Treatment
- Summary

Introduction

- DVT/ PE common (1 in 20 life risk)
- 60-80% of DVT patients will also have PE
- 18-30% mortality if PE untreated, 8% if treated²

Introduction

- Therapy prolonged, not benign
 - 5.6% complication rate with heparin
 - 2.8% complication rate with warfarin
- Classic signs of DVT not helpful in determining probability ²

Introduction

- Gold standard test invasive, costly, not readily available, not completely accurate

Rational of an Evidence Based Approach

- Goal is to bring the risk of the disease to the level of the risk of diagnosis and therapy⁹

The Evidence Based Approach to Diagnosis⁹

Step 1: Define pre-test probability

Step 2: Apply a diagnostic test

Step 3: Calculate post-test probability

- Repeat until threshold to treat or rule out is reached

Case Presentation: DVT

A 34 year old female presents with pain in her left calf after an 8 hour flight. She smokes and takes BCP's. Her left calf is 2 cm bigger than her right, is warm to touch with a positive Holmen's sign. There is no alternate diagnosis.

- What is her risk for a DVT?

Case Presentation

- No risk (0%)
- Low risk (0-20%)
- Medium risk (20-80%)
- High risk (80-100%)

Risk calculation

- Physicians unreliable in determining DVT risk
- Wells designed a scoring system to accurately calculate pre-test probability of DVT

Wells, et al. *Lancet* 1995; 345:1326-30.

Anand et al. JAMA. 1998 Apr 8;279(14):1094-9.

Risk calculation

Malignancy (Rxn \leq 6 mos or palliative)	+1
Lower limb paralysis/ recent plaster cast	+1
Bedridden for $>$ 3 days/ surgery (\leq 4 weeks)	+1
Localized tenderness along deep veins	+1
Entire leg swollen	+1
Calf swelling $>$ 3 cm asymptotic side	+1
Pitting edema confined to symptomatic leg	+1
Dilated superficial veins (non-varicose)	+1
Alternative diagnosis $>$ or $=$ that of DVT	-2

Risk Calculation

- Scoring system:
 - High Probability DVT: ≥ 3
 - Medium Probability DVT: 1-2
 - Low Probability DVT: ≤ 0

Case Presentation: DVT

A 34 year old female presents with pain in her left calf after an 8 hour flight. She smokes and takes BCP's. Her left calf is 2 cm bigger than her right, is warm to touch with a positive Holmen's sign. There is no alternate diagnosis.

- What diagnostic test should you do?

Diagnostic Imaging

- Venogram
 - Proximal and distal
 - Non-diagnostic 20-25%
 - Causes DVT in 1%
 - Requires contrast dye through foot IV

Diagnostic Imaging

- Doppler Ultrasound
 - Great for proximal DVT
 - Unreliable for distal DVT
 - Only proximal DVT's cause PE's
 - 20-30% of distal DVT's progress

Diagnostic Imaging: Reality Check

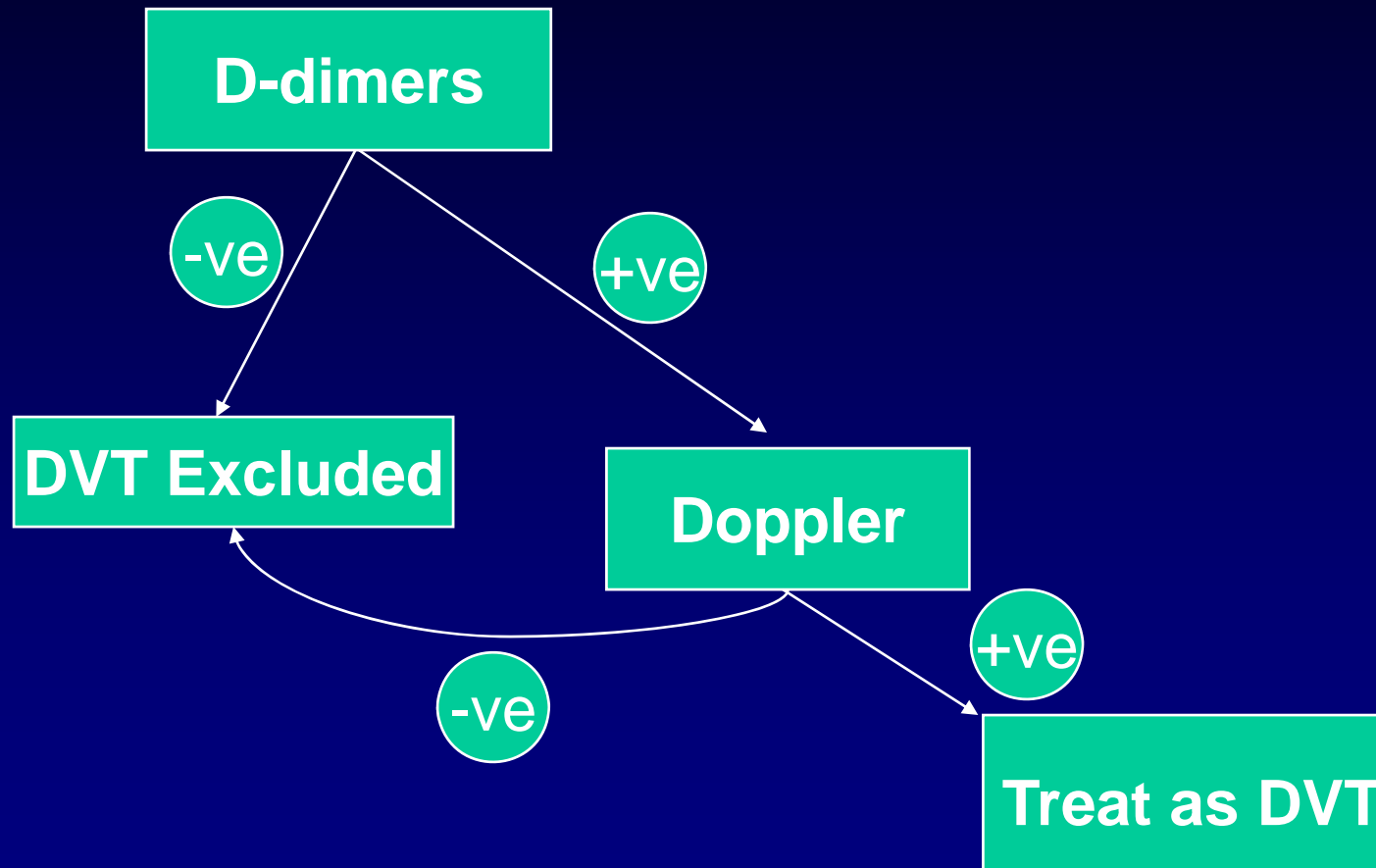
- Inconvenient (1.7-4.8 visits)
- Often unavailable or delayed
- Venogram used more commonly than recommended.
- Lack of reliable follow-up
- Cost effectiveness?

Whole Blood D-Dimer

- Indicator of active thrombosis
- Potentially useful to R/O DVT
- Must use newer whole blood (not serum) D-dimer tests
- Use in combination with pre-test probability

Diagnostic Protocols for DVT

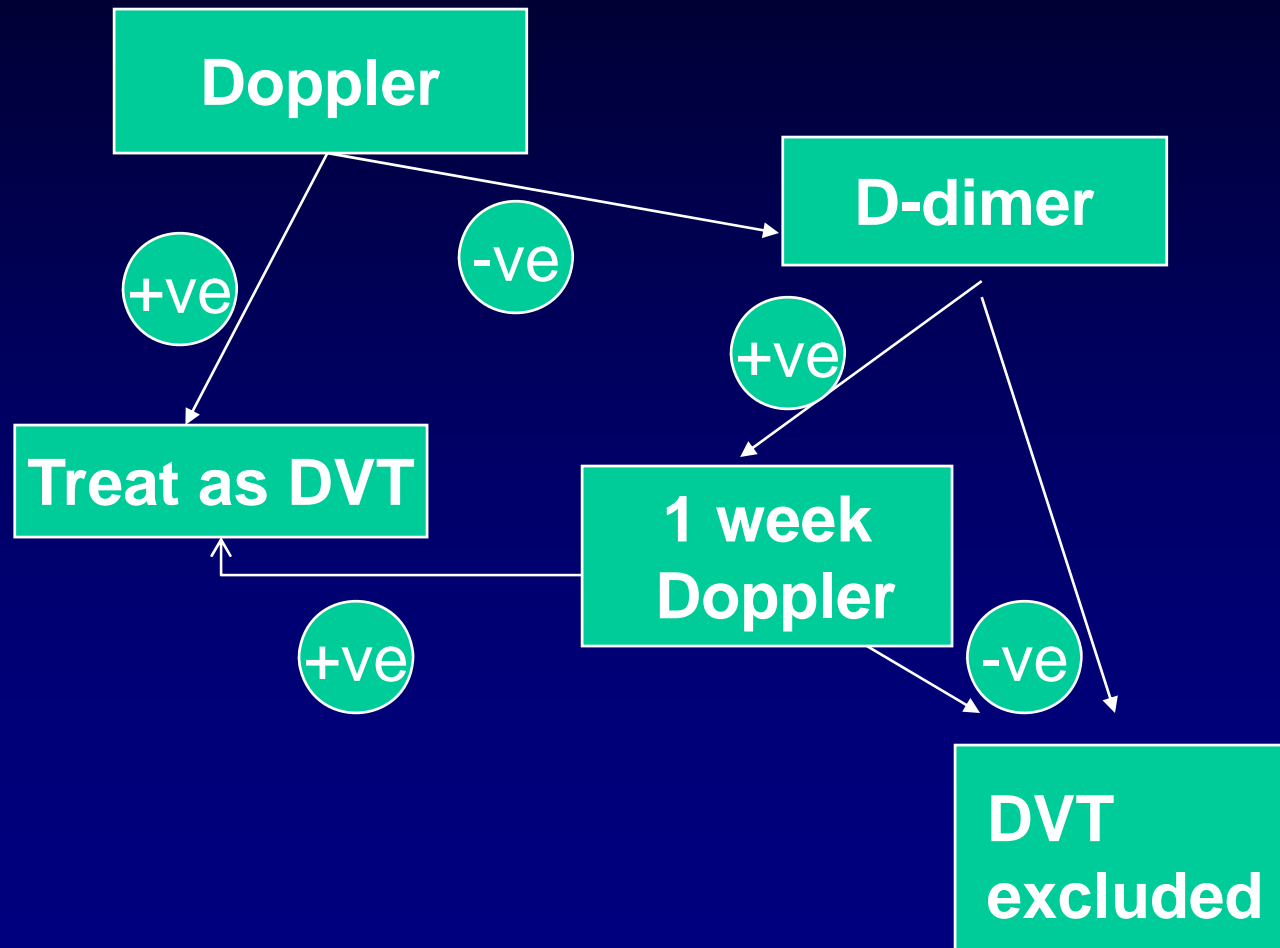
Low Pre-Test Probability



*What if her pre-test probability
was Moderate?*

Moderate Pre-Test Probability

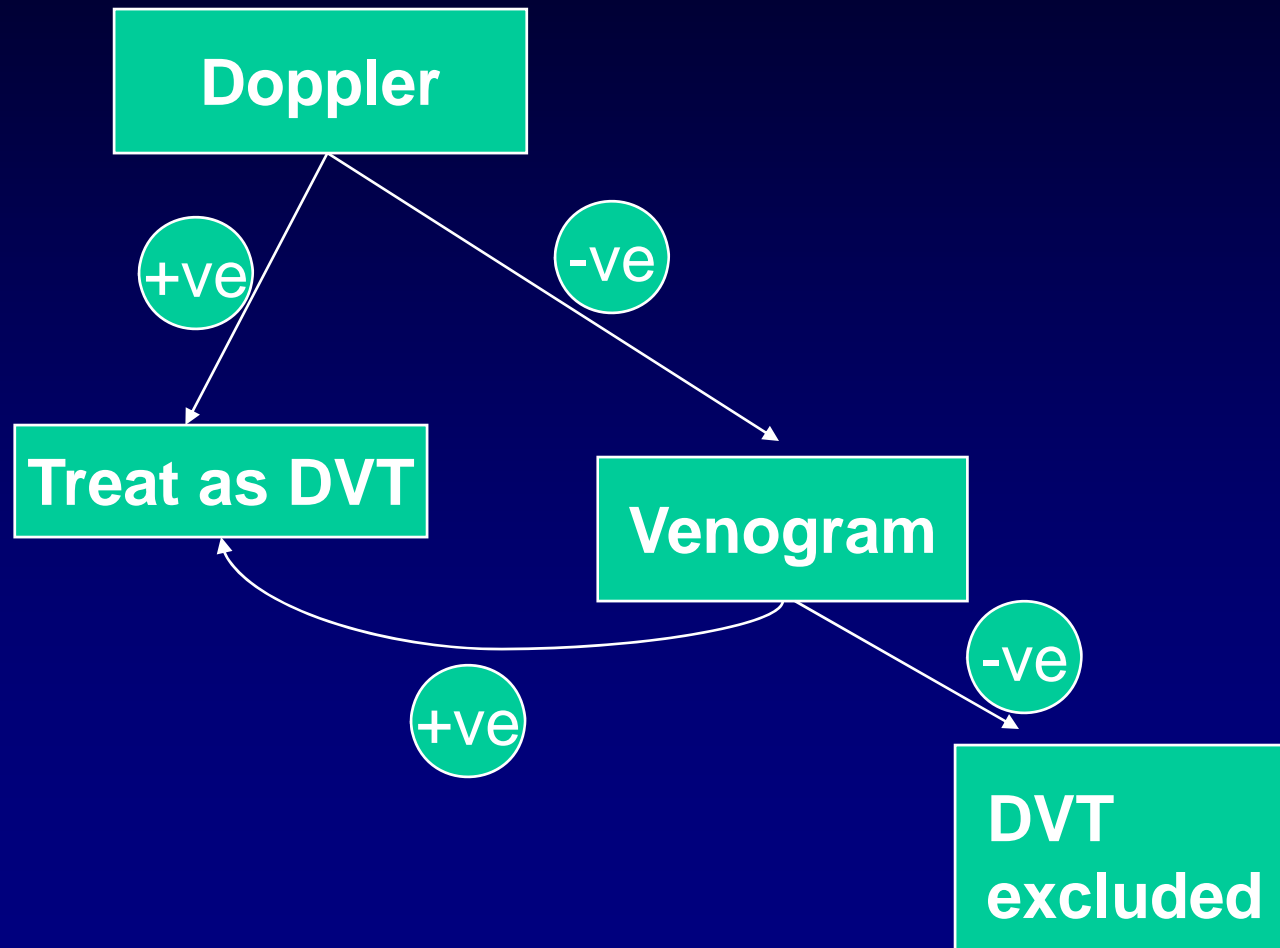
Treat with LMW Heparin until Doppler available



*What if her pre-test probability
was High?*

High Pre-Test Probability

Treat with LMW heparin until Doppler available



Case Presentation: DVT

A 34 year old female presents with a proven DVT.

- How would you treat her?

Low Molecular Weight Heparin

vs.

Unfractionated Heparin¹⁸

- Fixed dose, SC
- 4.3% complication rate
- 1.3% rate of major bleed
- 60% reduction in thrombus size
- 6.4% mortality rate

- Adjusted dose, IV
- 5.6% complication rate
- 2.1% rate of major bleed
- 54% reduction in thrombus size
- 8.0% mortality rate

Warfarin Therapy

- Start with heparin therapy
- Overlap treatment for 5-7 days
- Treat for 6 months
- Target INR: 2.5-3.5 (U.S.)
3.0-4.0 (U.K.)

Thrombolytic Therapy

- Only for massive ileofemoral vein thrombosis associated with limb ischemia or vascular compromise

American College of Chest Physicians (ACCP) consensus guidelines

Graded Elastic Compression Stockings

- Should be worn for 2 years to prevent post-thrombotic syndrome and recurrent DVT

Summary

- DVT is hard to diagnose
- Missing a DVT may be lethal
- Patient follow-up is paramount for DVT diagnostic and treatment protocols

Questions?

Thank You!