DVT - Agenda

1. **Clinical approach to DVT – Dr K Rajiv**
2. **Clinical case studies – Denise Brown**
3. **New DVT pathway in primary care – Dr. S Krishnasamy**
4. **Anticoagulation, DVT and PE options – Chris Lawson**

Clinical approach to DVT practice

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Introduction

- Deep Vein Thrombosis (DVT) and its complication Pulmonary Embolism (PE) are common conditions.
- The incidence of DVT is 1 in 1000 for all age groups.
- If untreated 50% of Proximal DVT may lead to PE of which 10% can be fatal; major morbidity issues.
- Many develop PTS = post thrombosis syndrome.

Background

- DVT needs to be distinguished from other causes presenting as leg swelling i.e. ‘DVT mimics’
- Clinical probability drives the diagnostic pathway
- Correct interpretation of the results of the diagnostic tests is crucial therefore dependent on clinical judgement.
- Do not use D-Dimer inappropriately. Check if you think its DVT and other causes are unlikely.

Clinical Aspects

- Determine the pre-test probability (PTP) it is important to remember that the patient may have unlikely DVT or likely DVT.

- Use clinical judgement by two methods.....

1.implicit clinical judgment of the Doctor - subjective.

2.explicit clinical decision making rules - Wells DVT score

- Make good use of clinical and diagnostics resources for Clinical Prediction Guide (CPG) .
- Select suspected DVT patients from the cohort of patients with swollen or painful leg.

Scenarios & Challenges

- Leg swelling with or without pain is a common symptom.
- Many of such patients are not a DVT and have an alternative diagnosis.
- Age predicted and false positive D-dimer is common.
- A suspected DVT may have symptoms of probable PE along with DVT. Beware if PE symptoms are there.

Differential Diagnosis for leg swelling (DVT)

- Unilateral Leg pain & swelling (suspect DVT).
  - **Deep Vein Thrombosis**
  - **Muscle trauma, rupture, haematoma**
  - **Ruptured Baker's cyst**
  - **Post thrombotic syndrome after old DVT**
  - **Lymphedema**
- Unilateral Leg pain only (is not a DVT).
  - **Nerve compression**
  - **Arthritis**
  - **Fracture**
  - **Tendonitis**
  - Arterial embolism
- Bilateral Leg swelling (is not a DVT).
  - **CCF**
  - **Nephrotic syndrome**
  - **Hepatic failure**
  - **Hypoalbuminaemia**
  - **Neuropathic Oedema**
- Superficial Thrombophlebitis is not DVT and usually cellulitis features obvious but may be a paraneoplastic presentation of underlying cancer or may lead to DVT through immobilization

Original Wells Score for DVT

1. Lower limb trauma or surgery or immobilization in plaster cast +1
2. Bedridden > 3 days or Surgery < 4 weeks +1
3. Tenderness along deep venous system +1
4. Entire limb swollen +1
5. Calf circumference > 3cm bigger 10cm below tibial tuberosity +1
6. Pitting oedema +1
7. Dilated collateral superficial veins (non-varicose) +1
8. Malignancy (including treatment up to 6 months previously) +1
9. Alternative Diagnosis more likely than DVT as above -2

- **Low probability score = 0**
- **Intermediate probability = 1 or 2**
- **High probability = More than 3.**

2- level simplified Wells Score

- ***Clinical feature = Points***
- **Active cancer (treatment on-going, within 6 months, or palliative)=1**
- **Paralysis, paresis or recent plaster immobilisation of the lower extremities=1**
- **Recently bedridden for 3 days or more or major surgery within 12 weeks requiring general or regional anaesthesia=1**
- **Localised tenderness along the distribution of the deep vein system=1**
- **Entire leg swollen =1**
- **Calf swelling at least 3 cm larger than asymptomatic side=1**
- **Pitting oedema confined to the symptomatic leg=1**
- **Collateral superficial veins (non-varicose)=1**
- **Previously documented DVT=1**
- **An alternative diagnosis is at least likely as DVT= -2**
- ***Clinical probability simplified scores***
- **DVT likely : 2 or more points**
- **DVT *unlikely :* 1 point or less**

Advance Points

1. D-Dimer > 8 in over 60 year old, then must look for an underlying malignancy even if DVT excluded.
2. Massive Ileofemoral DVT may need Thrombolytic Rx in some cases.
3. Pelvic DVT may need CT venography for diagnosis if Doppler US negative.
4. DVT in pregnancy is treated with LMWH as Warfarin is teratogenic and therefore contraindicated.
5. Venacaval Filter is used to prevent PE when Anticoagulation is contra-indicated
6. Unprovoked DVT > 40 years look for underlying cancer
7. Anti-Factor X eg. Fondaparinux SC or Rivaroxaban PO

Problems with Warfarin or Phenindione

- INR monitoring.
- Fluctuatiing INR
- Multiple clinic visits.
- Enoxaparin SC for 5 days.
- Logistics.
- Anxiety.
- Not patient friendly.
- Need something better.
- Many Clotting factors.

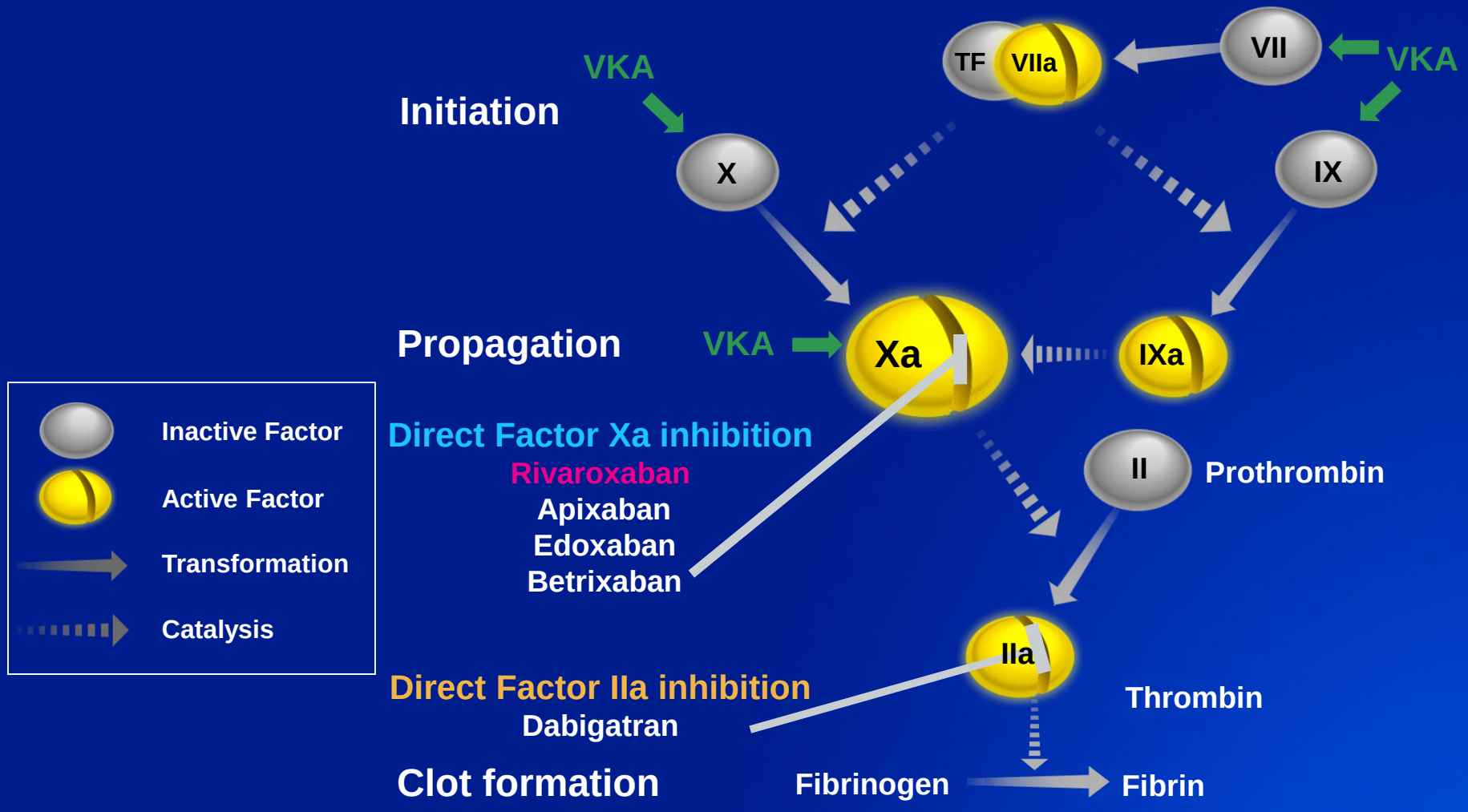
Quick recap of Clotting Factors

- Factor I = Fibrinogen
- Factor II = Prothrombin
- Factor III = Tissue factor
- Factor IV = Calcium
- Factor V = Labile factor
- Factor VI - later on discovered not to play a part in blood coagulation.
- Factor VII = Stable factor
- Factor VIII = Antihemophilic factor A
- Factor IX = Antihemophilic factor B or Christmas factor (named after the first patient in whom the factor deficiency was documented)
- **Factor X = Stuart Prower factor**
- Factor XI = Antihemophilic factor C
- Factor XII = Hageman factor
- Factor XIII = Fibrin stabilising factor

New approach to DVT treatment required

- Assess clinical case for the most likely diagnosis.
- Use 2 level Wells Score. Is it likely or unlikely DVT.
- Do a D-dimer test and follow the pathway.
- Use the new Primary care DVT pathway.
- Give a Stat dose treatment – NOAC.

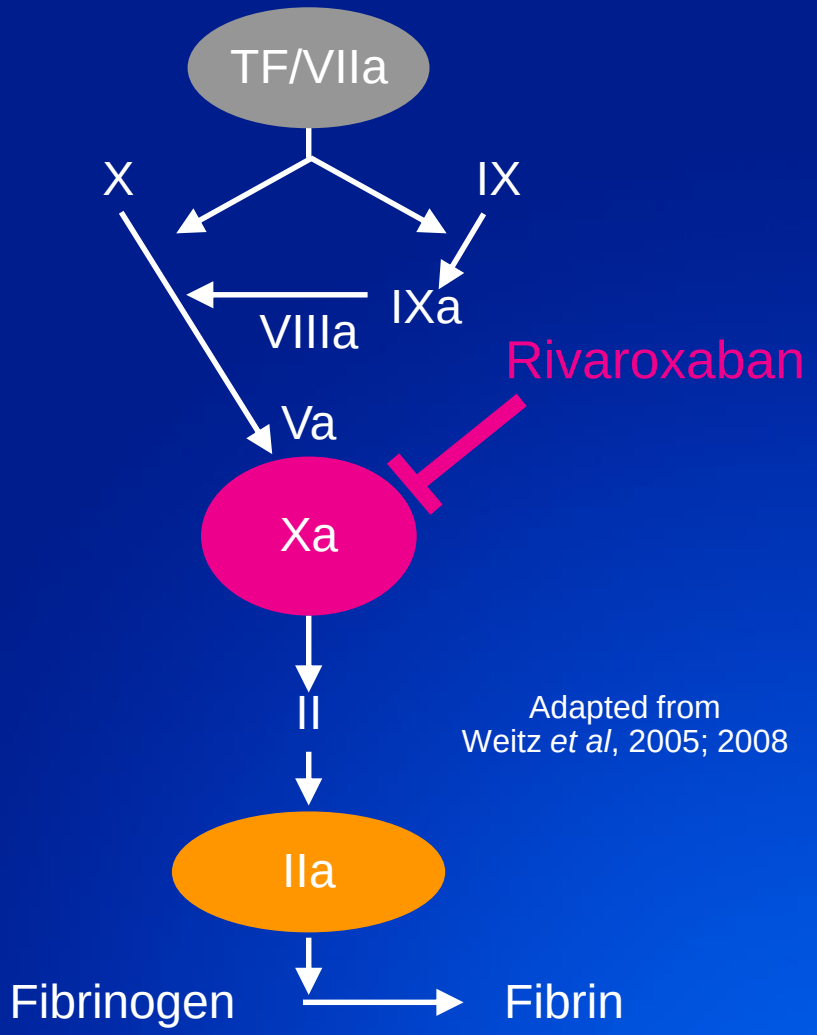
Targets for anticoagulants[1]



1. Spyropoulos AC *et al*. *Expert Opin Investig Drugs* 2007;16:431–440

Rivaroxaban

- Selective, direct Factor Xa inhibitor[1]
- High oral bioavailability[2]
- Rapid onset of action[3]
- Half-life:[2–4]
  - 5–9 hours in young individuals
  - 11–13 hours in the elderly
- Dual mode of elimination:[5]
  - 1/3 of active drug excreted unchanged by the kidneys
  - 2/3 of drug metabolized by the liver; half of which is excreted renally, half excreted via the hepatobiliary route



Adapted from Weitz *et al*, 2005; 2008

1. Perzborn *et al*, 2005; 2. Kubitza *et al*, 2005a; 3. Kubitza *et al*, 2005b; 4. Kubitza *et al*, 2008; 5. Weinz *et al*, 2009

DENISE BROWN

Thrombosis Clinical Nurse Specialist

BHNFT

Case Study 1

- 58yr old female seen by GP
- Injury to left leg 1 week ago
- Swollen calf 3/7
- GP did d-dimer 0.91 sent to ED
- Working as nurse restraining patient
- Twisted and landed on left knee/calf
- Painful, tender calf, not obviously swollen

- Bruises to shin and calf
- Left calf 38cm Right calf 36cm
- Wells score _____
- Given Dalteparin and ref. to thrombosis service as ? DVT

Thrombosis Assessment

- Proximal scan available this morning so patient advised where to attend
- Proximal scan negative for DVT
- Sock and shoe removed-not previously done
- Extensive bruising to foot/ankle/calf/shin
- Tender over all the bruised areas
- No risk factors for DVT
- Wells score -1

- Clearly injury
- Was d-dimer appropriate ?
- Doppler scan not repeated
- Contact tel no of clinic provided in case of further concerns

Case Study 2

- 76yr old lady, keen walker
- 2/7 pain behind & above medial ankle
- No trauma
- Not hot/red
- Bit swollen last night
- Wrist op 9/52 ago
- Mother had PE
- Daughter PE age 18yr on OCP

- No chest symptoms
- Left calf 39cm Right calf 39cm
- Tender to lower calf
- ? Varicose ? Collateral veins
- Impression ? Muscular/mechanical ? DVT
- Wells score _____
- Ref to thrombosis service

Thrombosis Assessment

- No swelling
- No calf tenderness
- Tender to bony part of inner ankle
- No new veins/phlebitis
- Wells score _____
- Family history
- No risk factors

- Routine bloods sent inc. D-dimer
- Proximal scan available in half an hour
- Proximal scan—negative
- D-dimer was negative
- Wells score was 0
- DVT very unlikely
- GP managed under new service

Case Study 3

- 44yr old man self referral to ED
- Swollen/painful Rt calf 3/7
- Feels like he is going to get pin/needles
- Flight 10/7 ago
- Insect bites and swollen foot while on holiday
- Previous DVT 8yr ago post fracture
- He feels that his foot is cold
- Noticed veins at back of his knee

Thrombosis Assessment

- Rt calf 38cm Lt 36cm
- Not obviously swollen
- Tender popliteal fossa
- New veins noticed by patient, back of knee
- Previous provoked DVT
- Foot warm and well perfused
- Risk factor-recent travel, 8 hours

- Wells score 3
- Routine bloods sent
- D-dimer positive at 3.6
- Proximal doppler scan arranged
- Scan- thrombus in popliteal vein
- LMWH given and warfarin started
- Health education provided re. anticoagulant therapy, DVT, risk of PE, compression socks, reducing risk of further DVT
- No further investigation as provoked
- Seen, assessed, diagnosed and treated in just under 4 hours

Summary

- Good clinical assessment with VTE risk factors
- Examine both legs from groin to toes
- What were you doing when it started ?
- What makes it worse/better ?
- Wells score open to interpretation
- D-dimer
- Alternative diagnosis

Primary Care Assessment of Suspected Deep Vein Thrombosis Pathway

Dr Krishnasamy

Why is There a Need for the New Pathway?

- 2013/14 – 428 Patients referred to Thrombosis Service
- 133 (approx. 30%) did not have DVT
- Total cost £32,229 (£186.85 for non-admitted face to face attendance. £56 per scan)
- Care closer to home

Goal of the Pathway

- Allow GPs to carry out: assessment, Wells score and D-dimer in primary care
- Early exclusion of DVT
- Prevent patients being referred to secondary care unnecessarily

Who is the Pathway For?

Inclusion Criteria:

- Suspected lower limb DVT
- New presentations only
- Aged 16 years and over
- “in hours” (Mon – Fri 9am-3pm)

Who is the Pathway Not For?

Exclusion Criteria:

- Suspected upper limb DVT
- Under 16 years
- Women who are pregnant, breastfeeding or have given birth in the last 6 weeks
- Patients with bilateral leg swelling
- The management of DVT and VTE in hospital, or the primary prevention of DVT.
- The management of people with coagulation disorders or with recurrent DVT who require long-term anticoagulation
- Patients with breathing difficulties

Refer Directly to Secondary Care

Arrange immediate hospital admission for patients with suspected DVT if they fall into any of these groups:

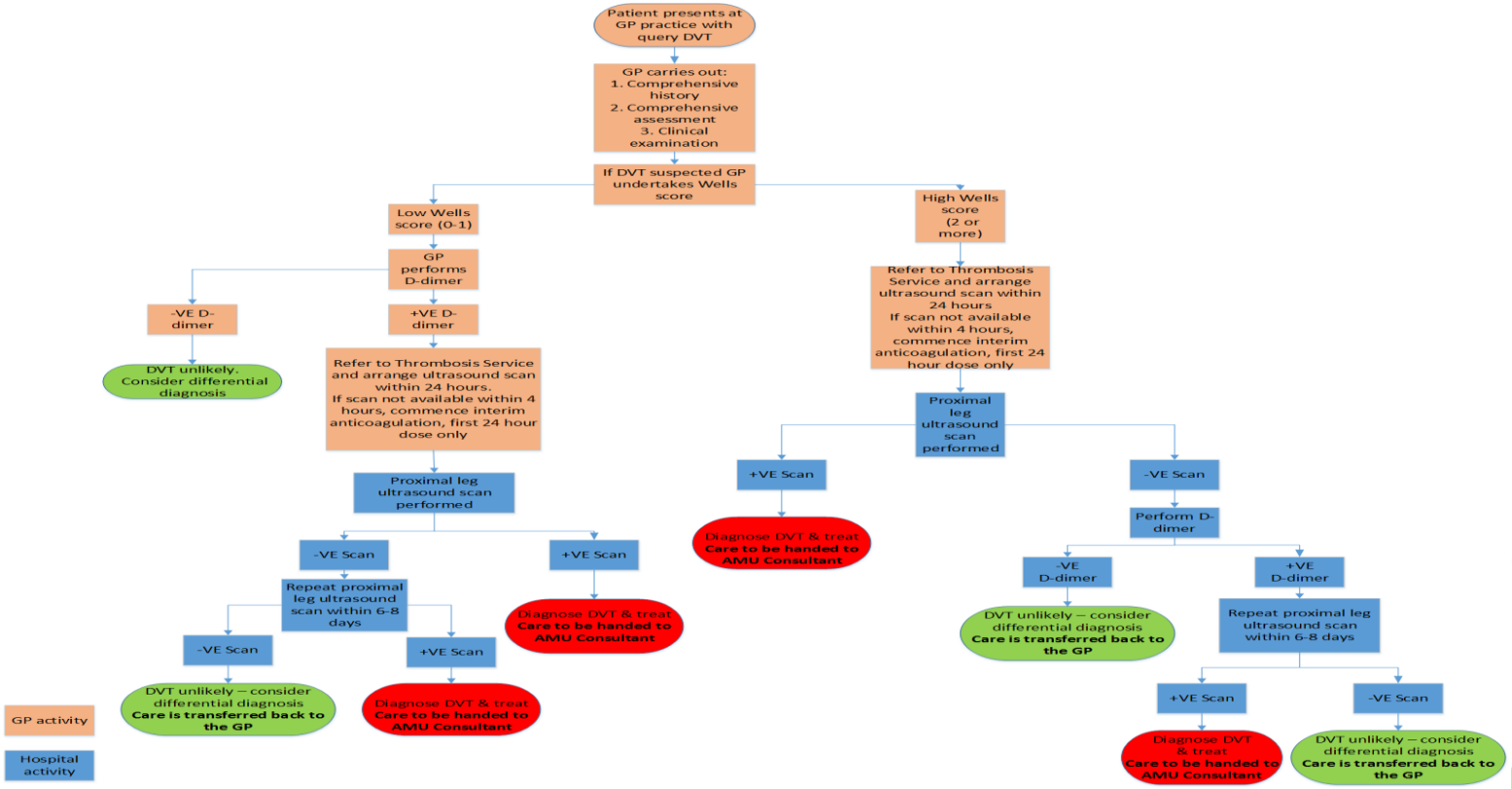
- Woman who is pregnant or has given birth within the past 6 weeks.
- Suspected pulmonary embolism
- High risk of bleeding

The more severe DVT also needs direct hospital admission. Features may include:

- Groin pain
- Significant colour change in the affected limb
- Involvement of the whole leg

The Pathway

Please refer to A3 printout



Wells Score

Please refer to printout

Clinical feature	Points	Patient score
Active cancer (treatment ongoing, within 6 months, or palliative)	1	
Paralysis, paresis or recent plaster immobilisation of the lower extremities	1	
Recently bedridden for 3 days or more or major surgery within 12 weeks requiring general or regional anesthesia	1	
Localised tenderness along the distribution of the deep venous system	1	
Entire leg swollen	1	
Calf swelling at least 3 cm larger than asymptomatic side	1	
Pitting oedema confined to the symptomatic leg	1	
Collateral superficial veins (non-varicose)	1	
Previously documented DVT	1	
An alternative diagnosis is at least as likely as DVT	−2	
Clinical probability simplified score		
DVT likely	2 points or more	
DVT unlikely	1 point or less	

Near Patient D-dimer

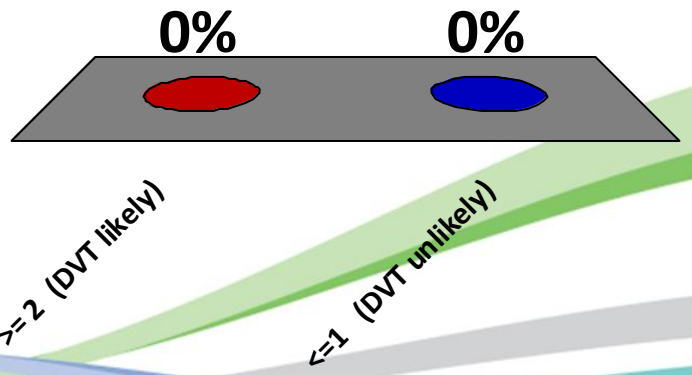
Use of DVT Pathway
Case 4

- 65 yr old lady, smoker
- Non small cell lung ca diagnosed 5 mths ago.
- Radiotherapy 4 mths ago
- Pain and swelling R lower leg
- No chest pain , no SOB , hx PE 6 yrs ago
- R leg 3 cm bigger than Left

What is the Wells Score ?

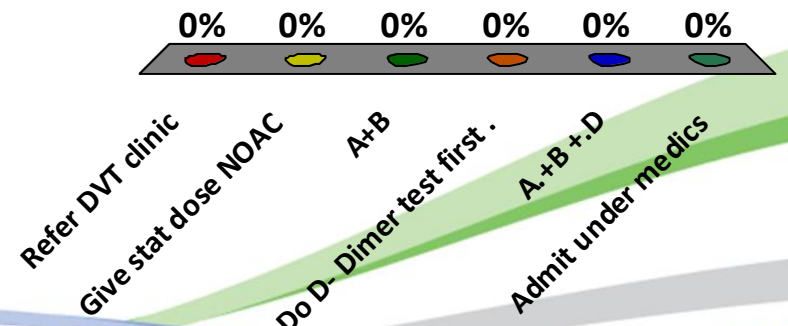
A. >= 2 (DVT likely)

B. <=1 (DVT unlikely)



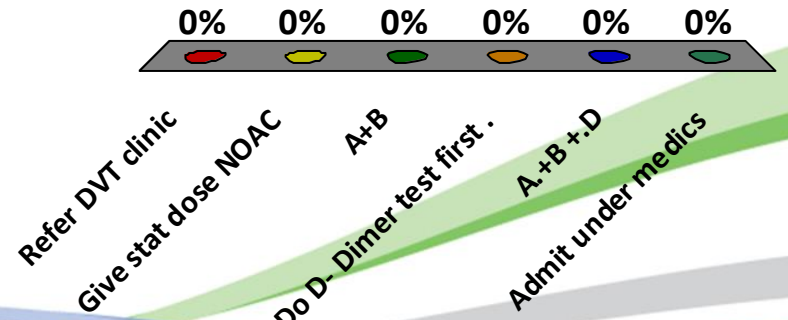
What would you do next if scan available in next 4 hours?

A. Refer DVT clinic
B. Give stat dose NOAC
C. A+B
D. Do D- Dimer test first .
E. A.+B +.D
F. Admit under medics



What would you do next if scan NOT available in next 4 hours?

A. Refer DVT clinic
B. Give stat dose NOAC
C. A+B
D. Do D- Dimer test first .
E. A.+B +.D
F. Admit under medics



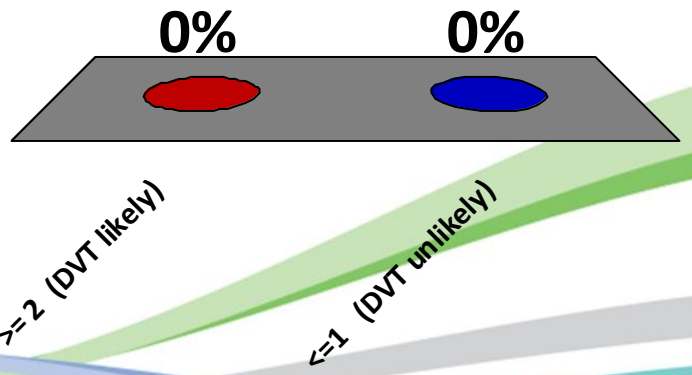
Use of DVT Pathway
Case 5

- 65 yr old lady, smoker
- Non small cell lung ca diagnosed 5 mths ago.
- Radiotherapy 4 mths ago
- Pain and swelling R lower leg
- L sided pleuritic pain , hx PE 6 yrs ago
- R leg 3 cm bigger than Left

What is the Wells Score ?

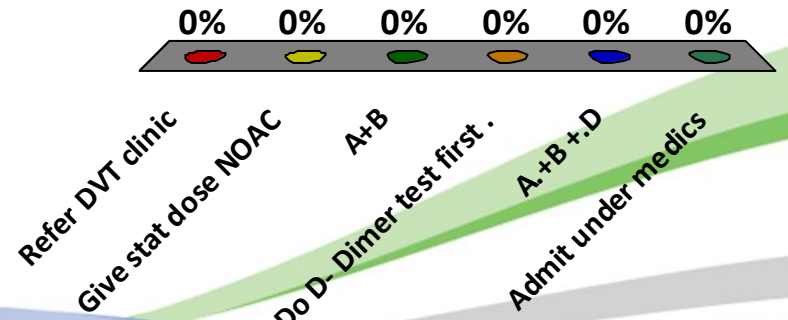
A. >= 2 (DVT likely)

B. <=1 (DVT unlikely)



What would you do next if scan NOT available in next 4 hours?

A. Refer DVT clinic
B. Give stat dose NOAC
C. A+B
D. Do D- Dimer test first .
E. A.+B +.D
F. Admit under medics



Remember the Exclusion Criteria!!!

Referring to the BHNFT Thrombosis Service

Referrals to Thrombosis Service:

- 09:00 – 15:00 Mon - Fri

Outside of these hours contact either:

– RightCare Barnsley or

– A&E/ AMU

Handover of Responsibility

- When a patient attends the Thrombosis Service and is diagnosed with DVT, their care then hands over to the secondary care consultant
- The drug regime may be changed by the secondary care consultant – this is that their discretion

Recording on the Practice System

CSU will provide an electronic referral form, to capture information (Please refer to printout)

What You Have to do Before "Go Live"

- **Order NOAC**
- **Order D-dimer test kits**
- **Train on use of D-dimer**
- DVT Pathway pack will be sent out to practices

Thank you

Any questions?