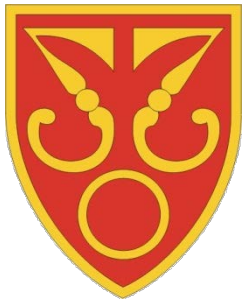
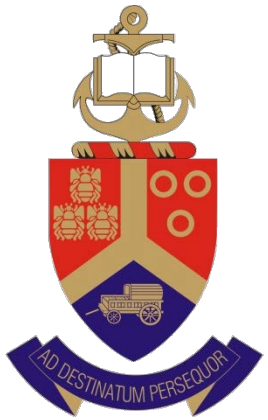
Are Surgeons Vigilant enough for DVT ?

S.C TSOTETSI





INTRODUCTION

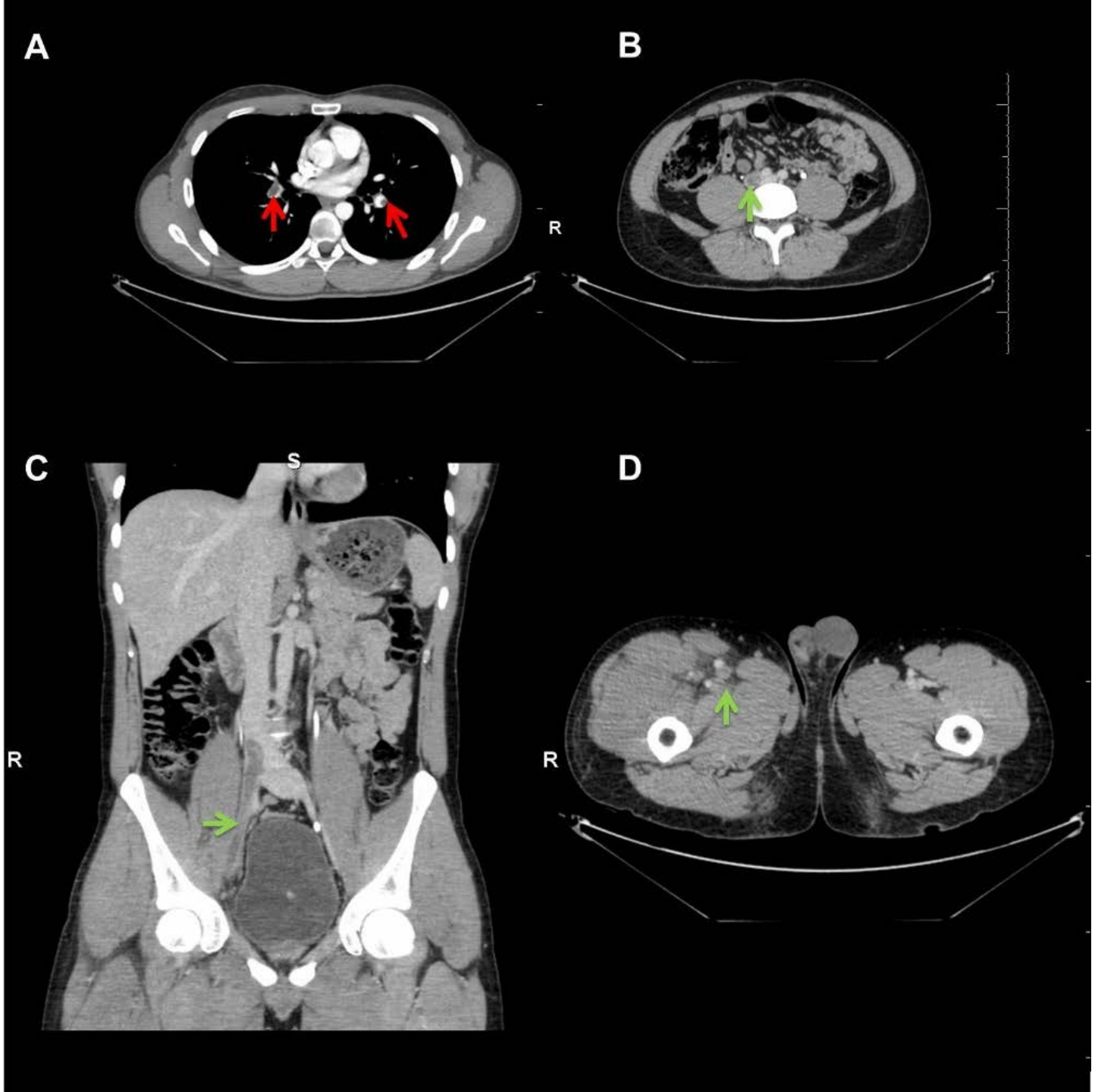
- Source of acute morbidity and mortality
- Late morbidity: PTS and pulmonary HPT
- ↑ Use of endovenous therapy

WHY TREAT ?

- 20% Untreated calf thrombosis ➔ proximal DVT

- Untreated proximal DVT ➔ 50% **PE** and 10% being fatal
- RECURRENT THROMBOSIS
- PLEGMASIA CERULIA DOLENS
- POST THROMBOTIC SYNDROME

  - VENOUS PATENCY
  - VALVULAR FUNCTION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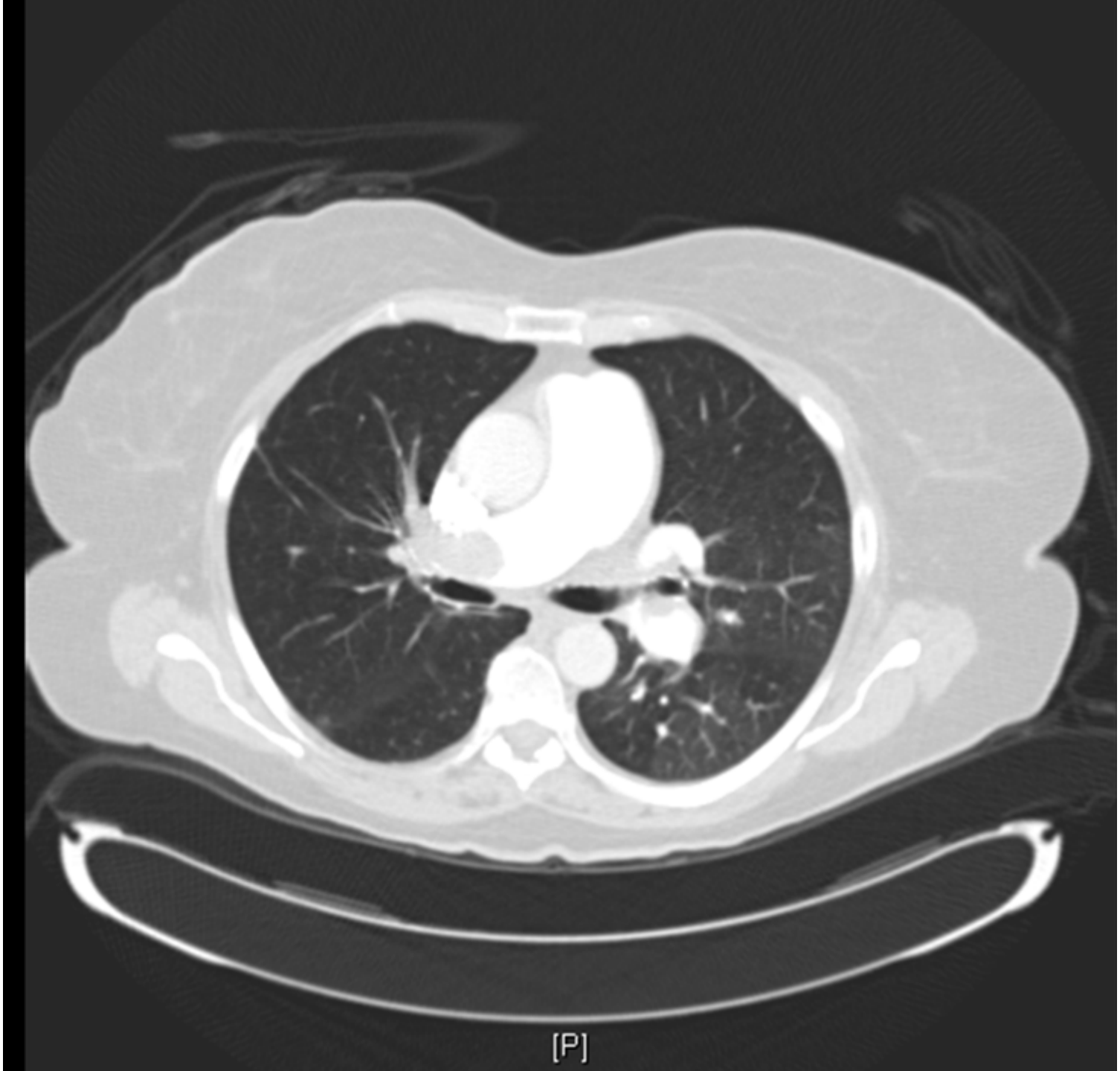
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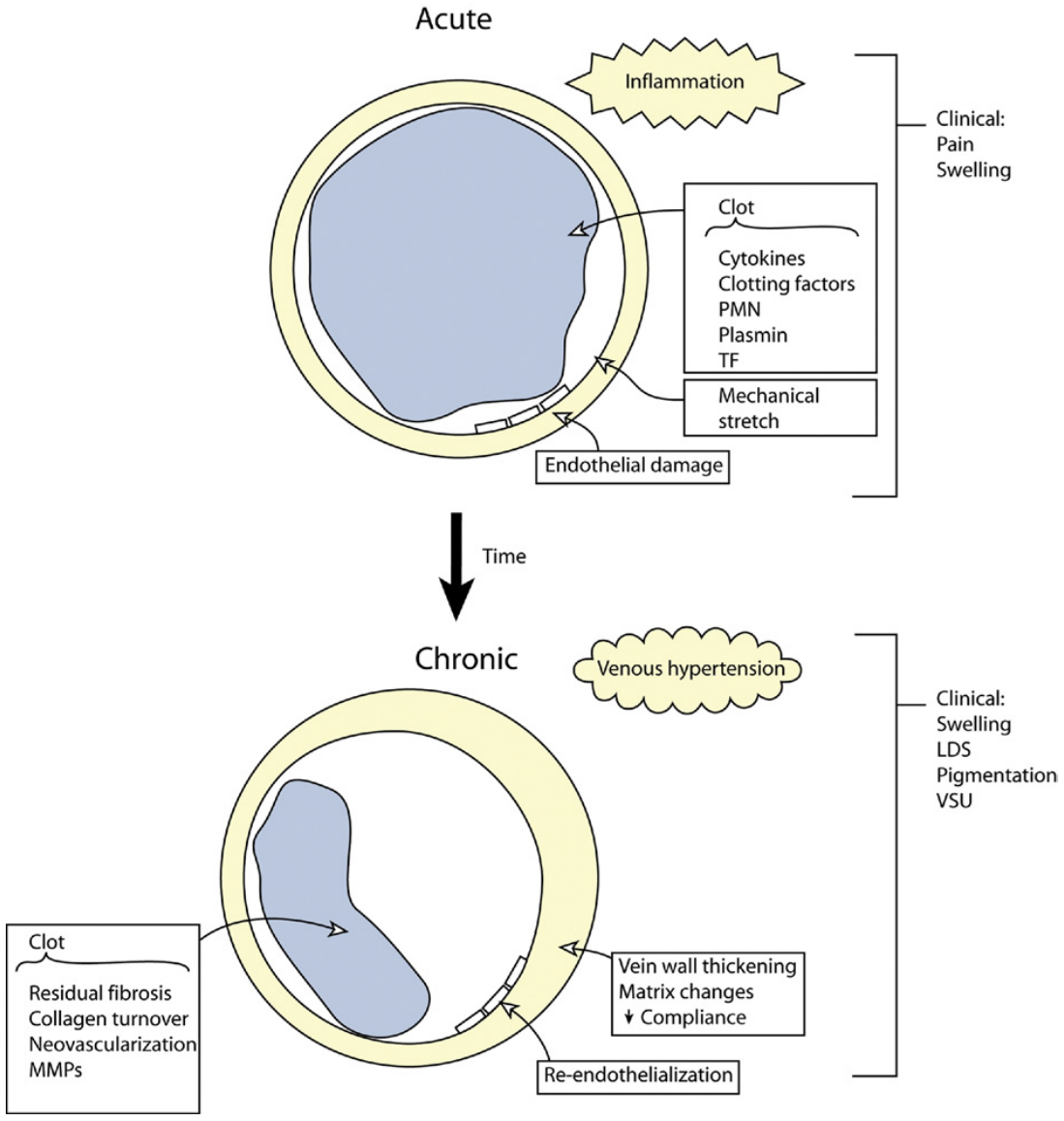
Postthrombotic Syndrome



DIAGNOSIS

- CLINICAL (WELL'S SCORE)
- D-DIMER
- **DUPPLEX ULTRASOUND**
- CTA
- VENOGRAPHY

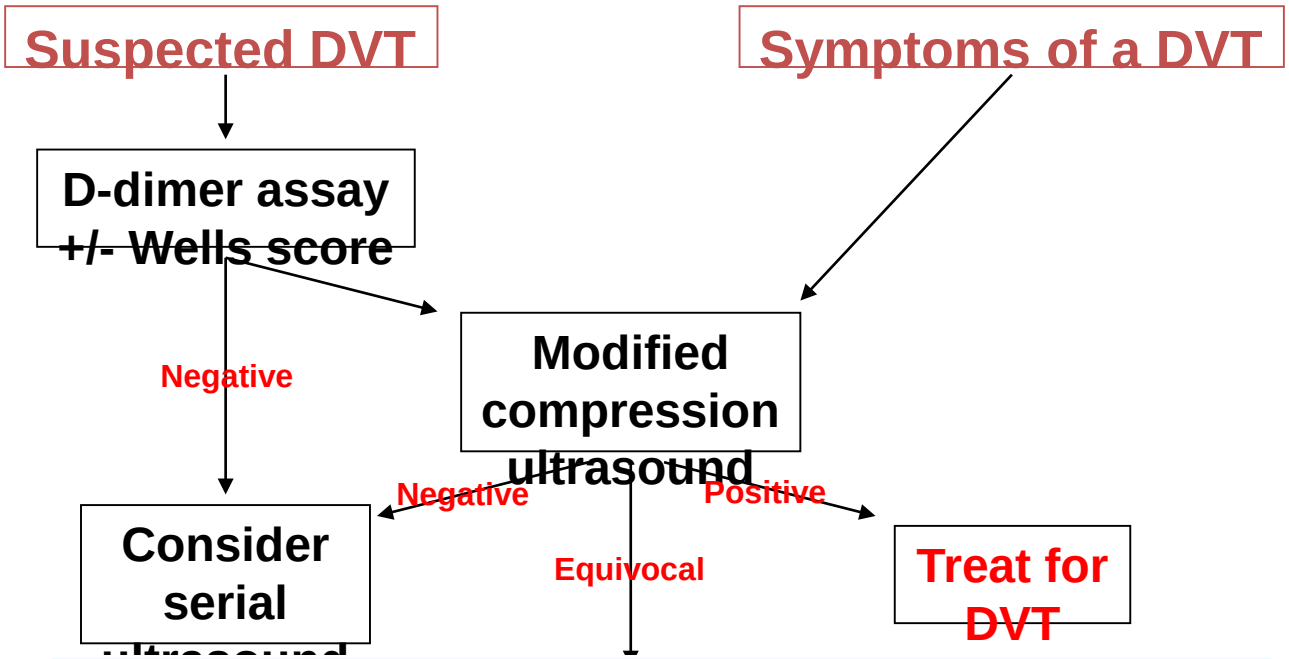


Table VI. Modified Wells score[4,6]

	Score*
Paralysis, paresis or recent orthopaedic casting of a lower limb	+1
Recently bedridden for longer than 3 days or major surgery in the last 4 weeks	+1
Localised tenderness of the deep lower-limb veins	+1
Swelling of the entire lower limb	+1
Calf swelling (3 cm > the other limb, measured 10 cm below tibial tuberosity)	+1
Pitting oedema of the symptomatic limb	+1
Collateral superficial veins (not varicose veins)	+1
Active cancer or cancer treated within the last 6 months	+1
An alternative diagnosis more likely	-2
Previous VTE	+1

* 1 or less – DVT unlikely; 2 or greater – DVT possible.

THROMBOPHILIA SCREENING

- Testing all patients unwarranted
- Testing recommended for:

1. 1st episode of idiopathic DVT at age < 50
2. Recurrent DVT (UNPROVOKED)
3. Positive family history of thrombosis
4. Women who develop DVT during pregnancy or in hormonal therapy

TESTS: antithrombin, Protein C and S, Factor V Leiden, Prothrobin G20210A mutation, Lupus anticoagulant , antophospholipid antibodies, homocysteine and **HIV**

Isolated Calf Vein Thrombosis

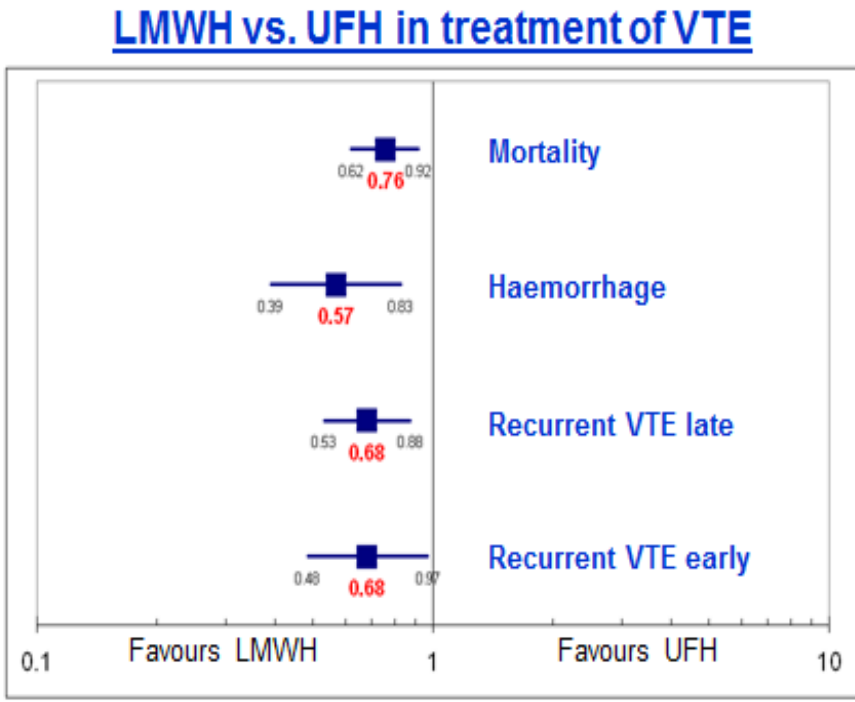
- PE has been noted in 10% of the cases as opposed to 30-50% for proximal DVT
- 20% rate of proximal propagation if no treatment is given
- 23% risk of post thrombotic syndrome if untreated
- Non-severe symptoms, or risk factors for extension → serial imaging for 2weeks
- Severe symptoms, risk of extension → anticoagulate

Thrombosis at other locations

- **Upper limb** – axillary and more proximal anticoagulate
- **Splanchnic, hepatic vein** – anticoagulate if symptomatic

Uncomplicated DVT

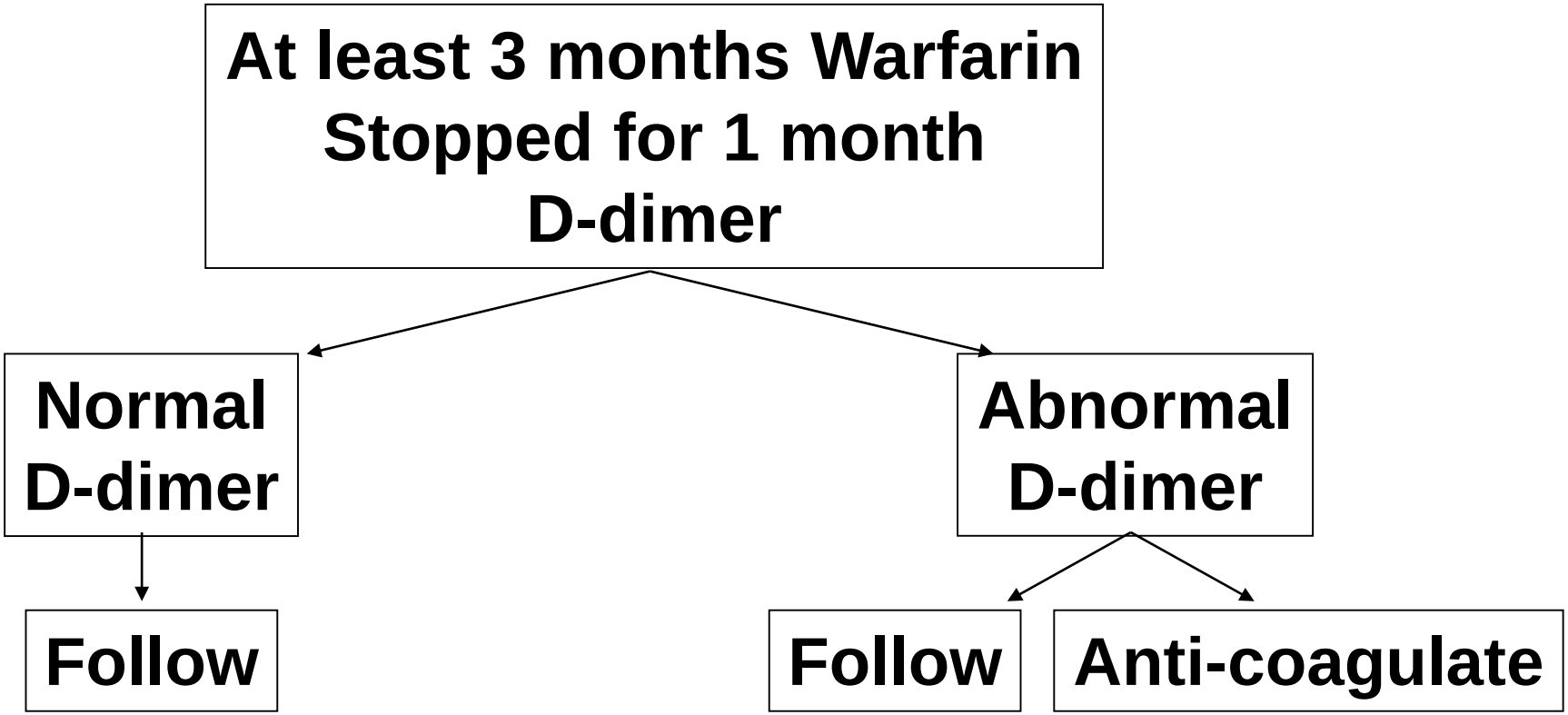
- LMWH Vs UFH
- Heparin → Warfarin
  INR 2.0 – 3.0
- Vit K antagonist started on the same day
- Warfarin is TERATOGENIC
- Compression therapy



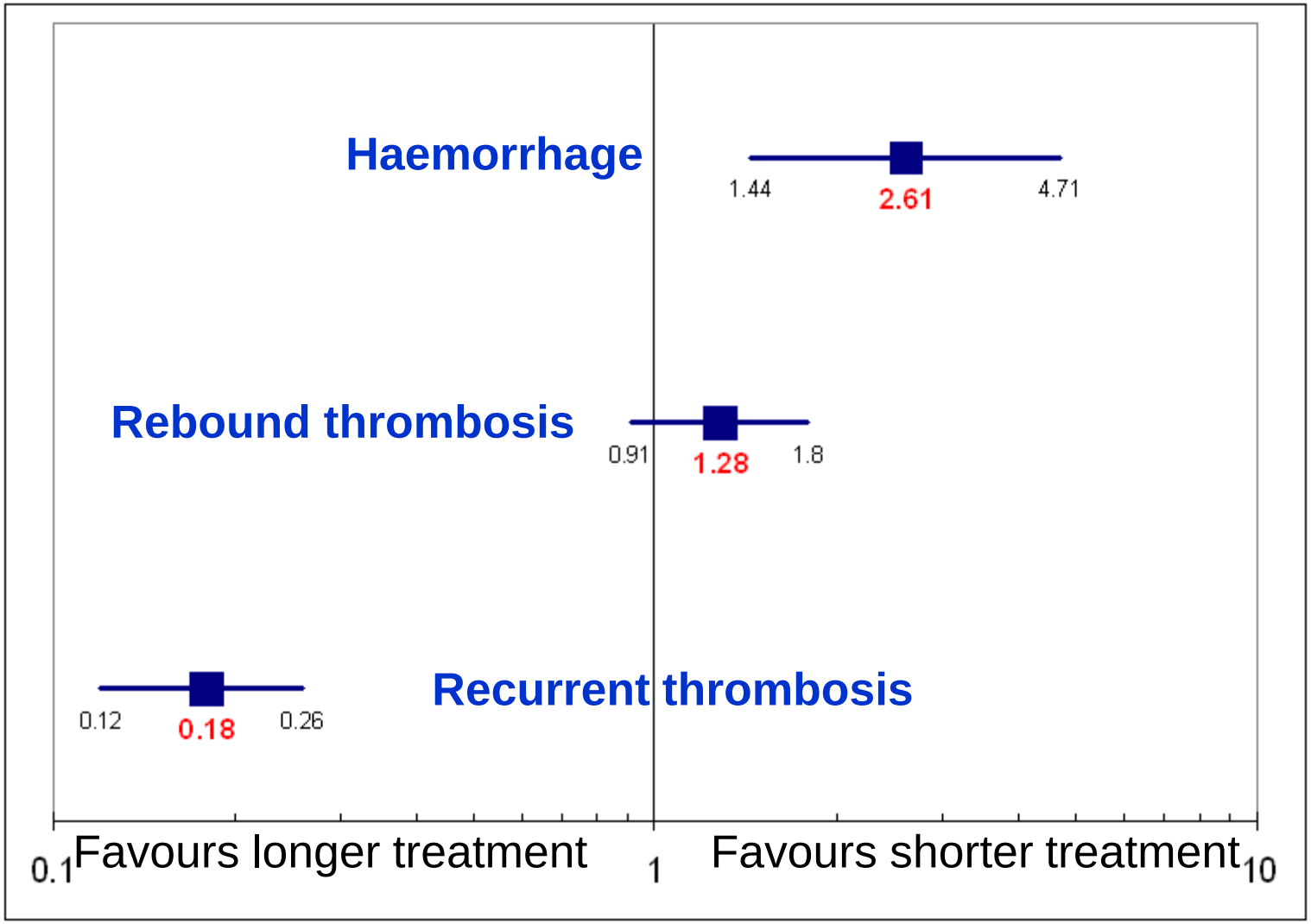
Duration of anticoagulation

PROLONG study:

G. Palareti et al. NEJM 2006;355:1780-9



Duration of anticoagulaton



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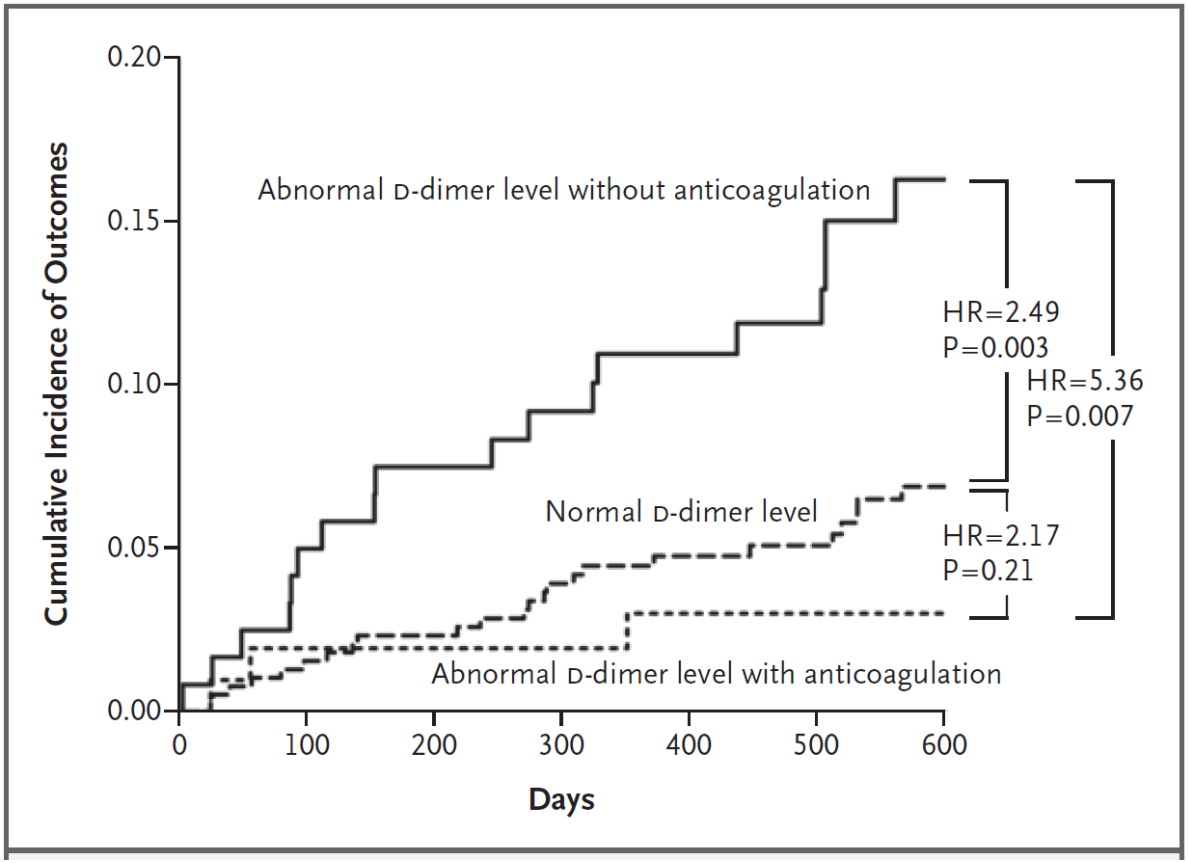


NEWER ANTICOAGULANTS

- Problems with current ones:

LMW HEP: shorter half life

parenteral

WARFARIN: narrow therapeutic range monitoring

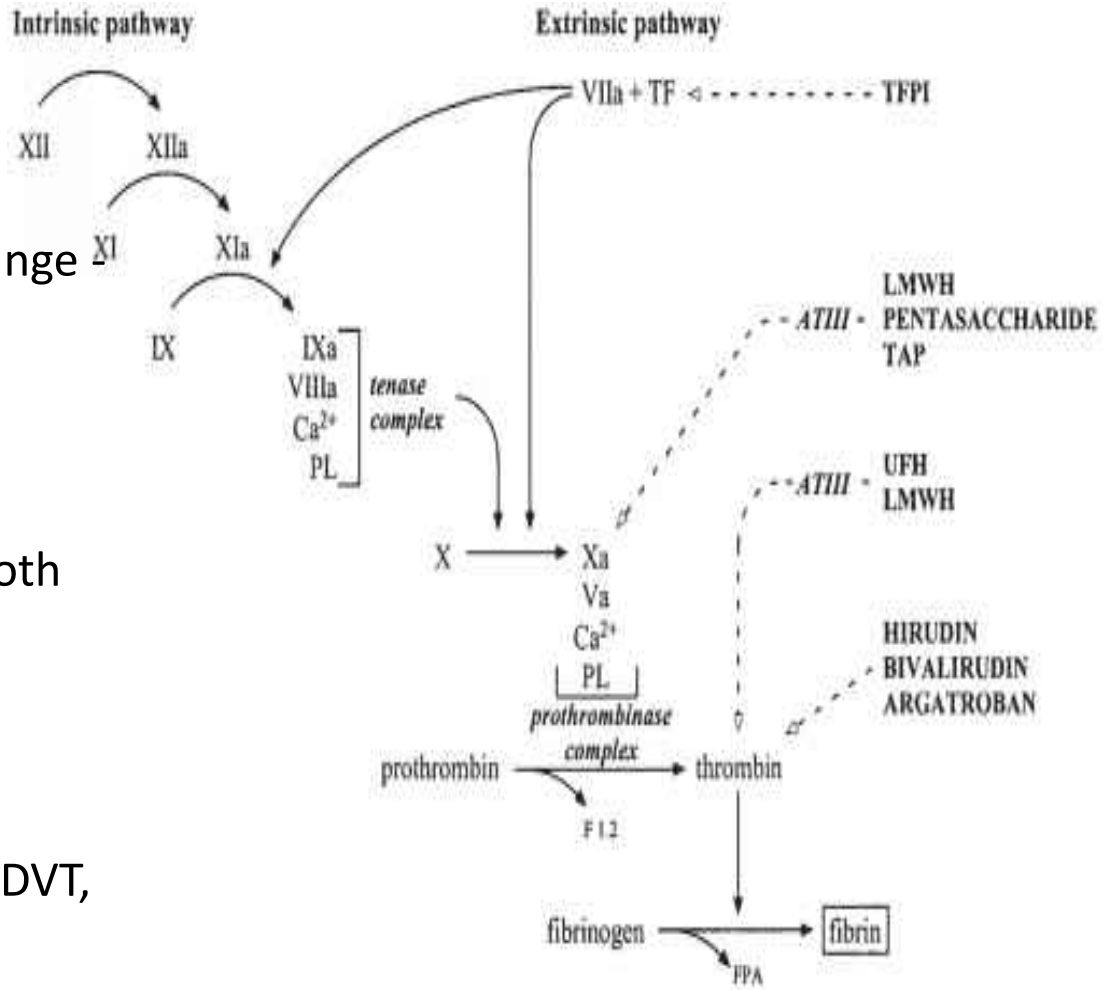
individual variation in dose response

Multiple drug interactions

New oral anticoagulants – Tx of both acute DVT and prevention of recurrence.

No need for monitoring

Rivaroxaban Approved for acute DVT, and PE Tx (?? New gold standard)



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Full Length Article

Safety and efficacy of direct oral anticoagulants compared to warfarin for extended treatment of venous thromboembolism -a systematic review and meta-analysis☆,☆☆,★

Caroline Sindet-Pedersen [a,b,*], Jannik Langtved Pallisgaard [b,c], Jonas Bjerring Olesen [b], Gunnar Hilmar Gislason [b,c,d,e], Lourdes Cantarero Arevalo [a]

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It is not possible to conclude whether there is a clinical benefit from using DOACs compared to warfarin. However, DOACs do not require dose titration, which could make outpatient management less challenging.

VTE and cancer

- **Idiopathic symptomatic DVT – 10% incidence of subsequent cancer**
- **Higher risk of recurrence of VTE in cancer patients (20% vs. 6% at 1 year)**
- **Higher risk of haemorrhage**
- **lower recurrence rates and Bleeding when LMWH used as sole anticoagulant**

RATIONAL FOR THROMBUS REMOVAL

- iliofemoral DVT treated with anticoagulation alone → **venous hypertension** in 5 years in 95% cases and symptoms in 90% of cases, 15% venous ulcers

- Early thrombus removal → better venous patency and valve function → lower ambulatory venous pressure → fewer post thrombotic symptoms

- **Massive PE** with shock has a 20% mortality

- **Phlegmasia cerulea dolens** → venous gangrene

SURGICAL THROMBECTOMY

- Fallen out of favour – operative morbidity
- **Used for Phlegmasia cerulea dolens and pulmonary Embolism** when:

1. Thrombolysis contraindicated
2. PMT not available
3. Treatment failure

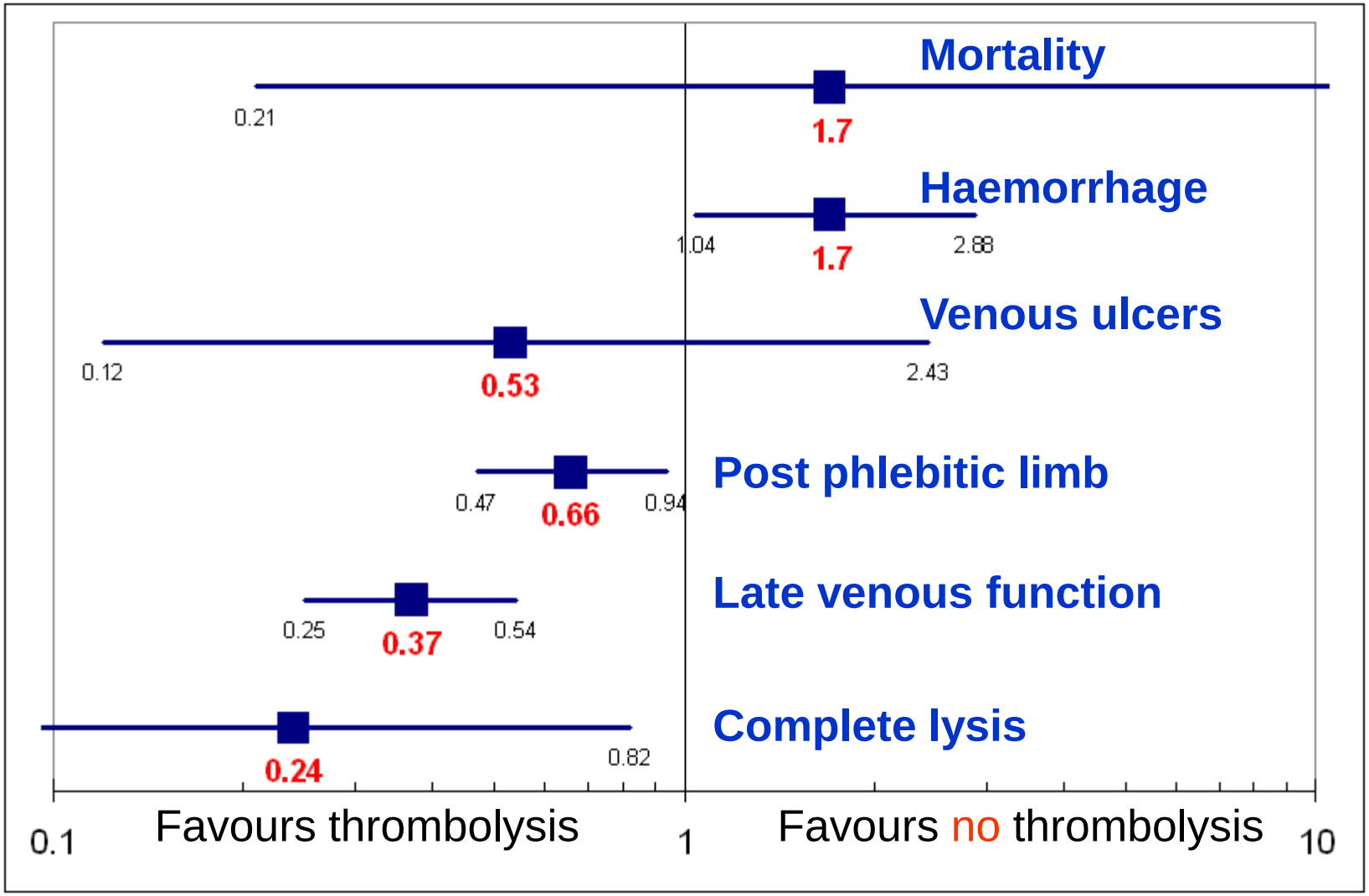
PHARMACOMECHANICAL THROMBECTOMY

- Not clear if it will improve outcome or ↑ complications
- Offers synergistic effect for more timely and effective clot removal
- Emergencies when thrombolysis is contra indicated
- Reduced cost (hospital stay and less theatre time)
- Need for IVC filter (FILTER-PEVI trial)

THROMBOLYSIS

- Systemic → CDT
- Less complications
- Lack of randomised controlled trials
- Intervention with risk of severe morbidity or mortality vs non-fatal DVT complication
- 2012 ACCP guidelines recommends anticoagulation alone CDT for proximal DVT

Thrombolysis for VTE



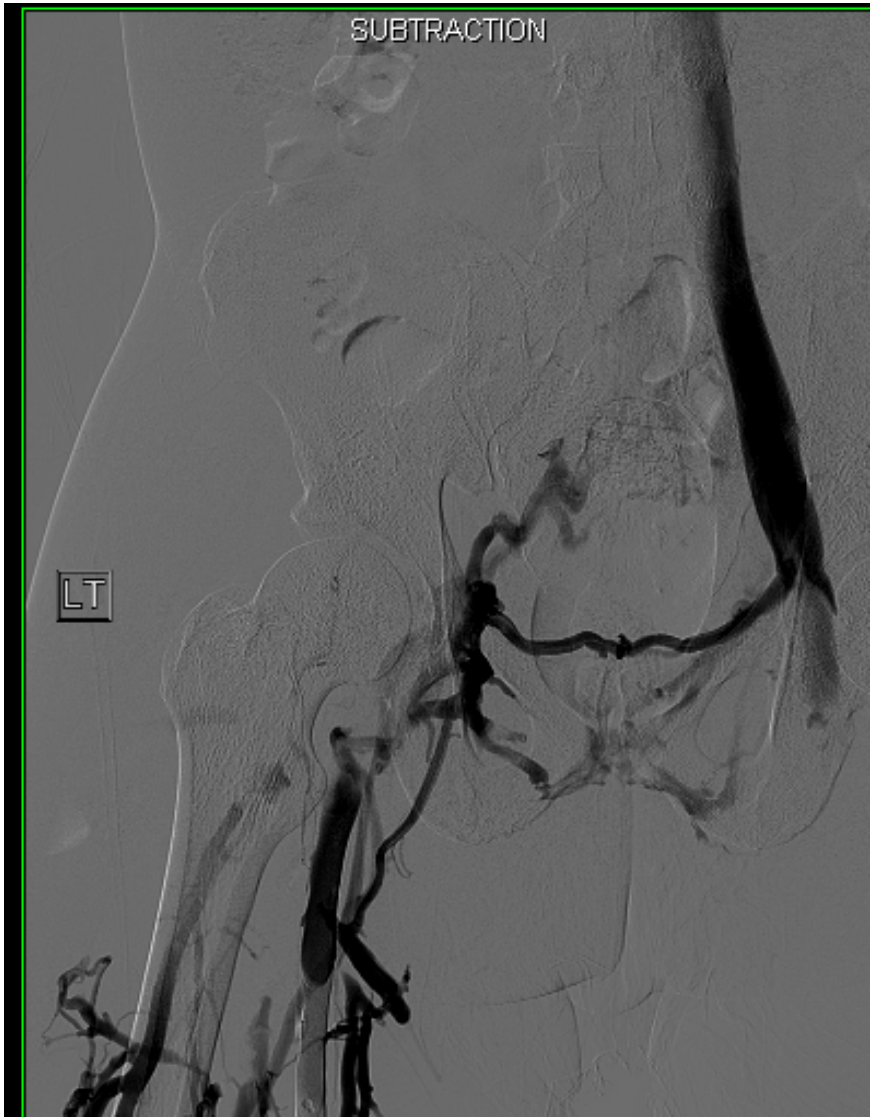
CaVenT study (2012): NNT 7 at 24 months for PTS

Indications

- Iliofemoral or IVC thrombus
- Acute limb compromise
- Anatomical cause of DVT
- Short onset of symptoms (< 14 days)
- Pulmonary embolism

Contra- indications

- Bleeding diathesis
- Organ specific bleeding risk
- Renal or hepatic failure
- Malignancy (Brain mets)
- Pregnancy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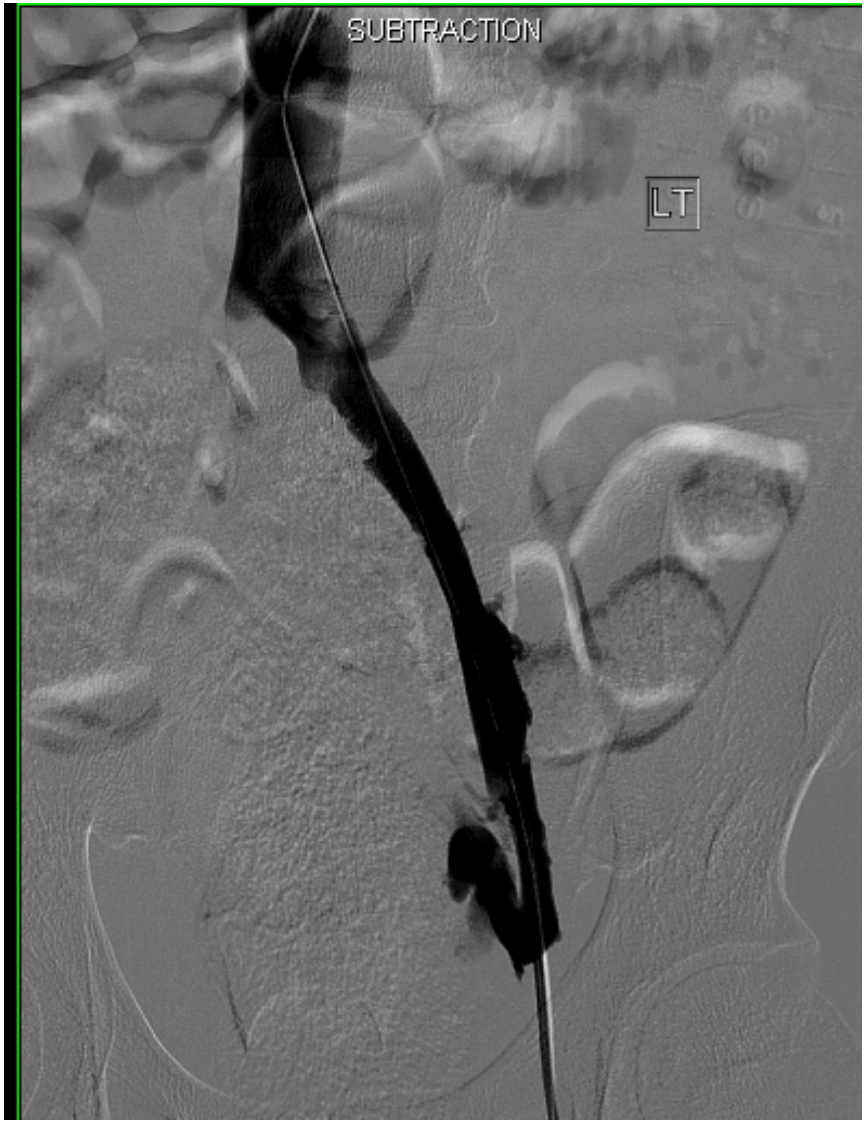
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CAVENT Trial catheter-directed thrombolysis versus standard treatment for acute iliofemoral deep vein thrombosis

Adverse Events (AEs)

AEs	Additional CDT (n = 101)	Standard treatment (n = 108)
Bleeding complications	20	0
Major bleeding complications	3	0
Clinically relevant bleeding complications	5	0
Deaths	0	NR
Pulmonary embolisms	0	NR
Cerebral hemorrhages	0	NR
Nonbleeding complications	4	NR
Recurrent VTE at 24 mo	10	18

NR = not reported

During follow-up, 28 patients had recurrent VTE and 11 had cancer; no significant difference between treatment groups ($p > 0.05$).

Enden T et al. *Lancet* 2012;379(9810):31-8.

PTS After 24 Months in Patients with Iliofemoral Patency or Insufficient Recanalization After 6 Months

Outcome	Regained iliofemoral patency (n = 103)		Insufficient recanalization (n = 80)		*p*-value
	n	% (95% CI)	n	% (95% CI)	
PTS after 24 mo	38	**36.9** (28.2-46.5)	49	**61.3** (50.3-71.2)	0.001

- Absolute gain in short-term endpoint iliofemoral patency after 6 months in CDT versus standard therapy group: 18.5% (95% CI 4.2–31.8).
- Absolute risk reduction in the frequency of PTS after 24 months in patency versus insufficient recanalization: 24.4% (95% CI 9.8–37.6).

Enden T et al. *Lancet* 2012;379(9810):31-8.

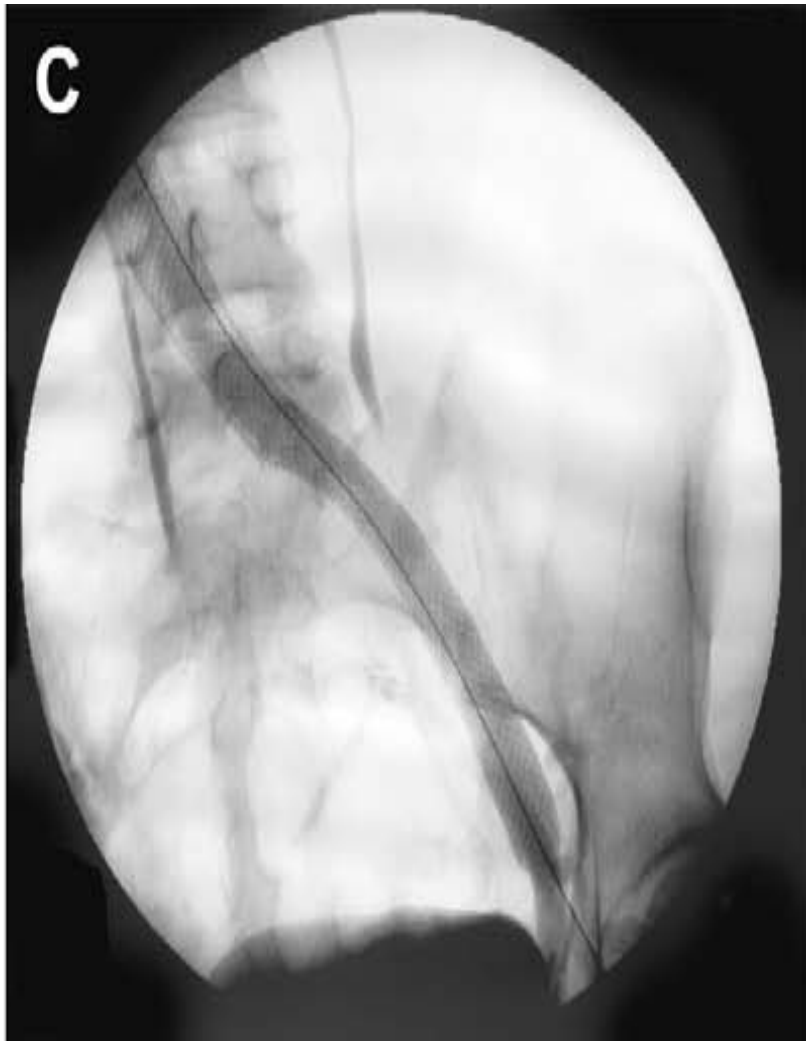
Arguments against thrombolysis

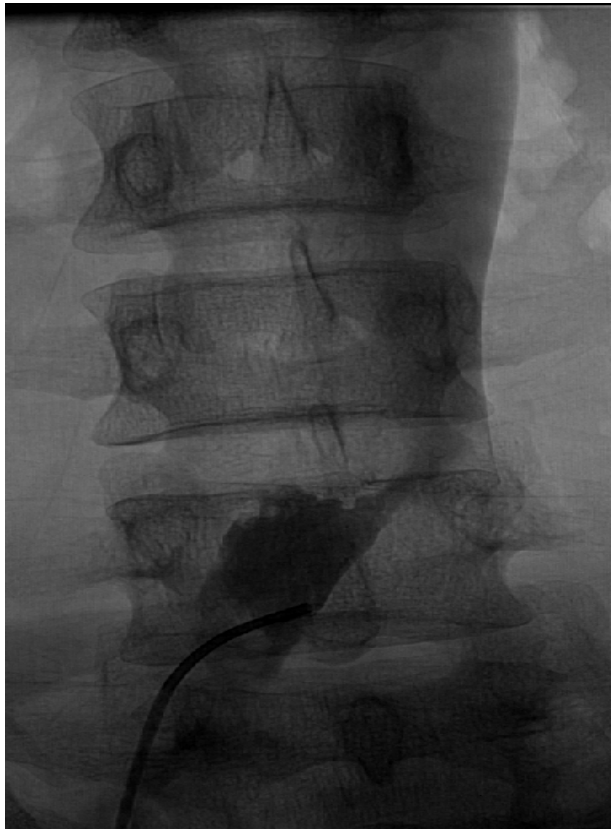
- ‘Most series reporting the results CDT establish little other than that thrombolytic agents **do effectively lyse thrombus** in at least some patients, that the rate of **bleeding complication is higher** than that usually associated with standard anticoagulation, and that many patients require **venous stenting for technical success’**

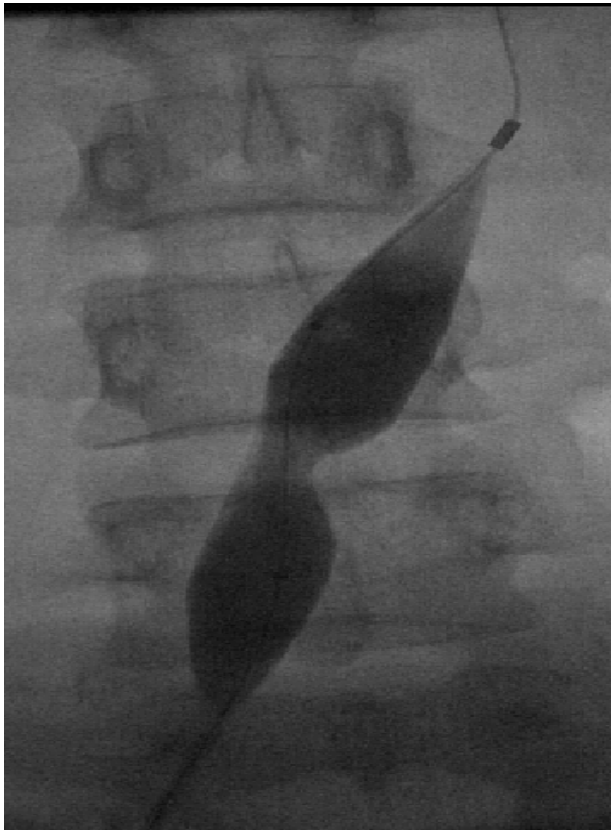
- **MH Meissner, Dis Mon 2010;56:642-652**

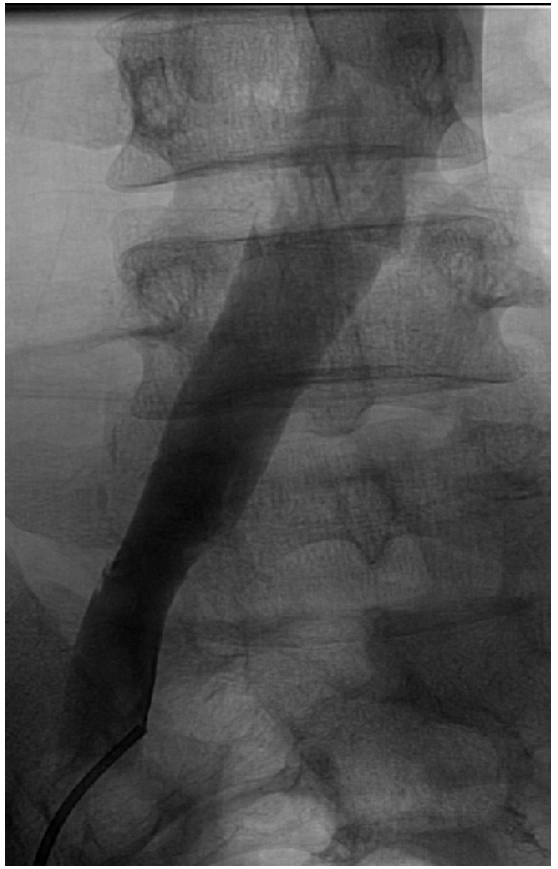
VENOUS STENTING

- **Indication**: Ilio-caval obstruction
- (May-Thurner)
- Balloon angioplasty alone → rethrombosis
- Stenting with **dedicated venous stents**
- **Determinants of long term patency** – inflow, untreated concurrent stenosis









PULMONARY EMBOLISM

- **Asymptomatic** – **mild symptoms** = anticoagulate
- IVC filter if anticoagulation contraindicated
- **Hypotension + Signs of right ventricular strain**

1.Thrombolysis (systemic)

2. PMT

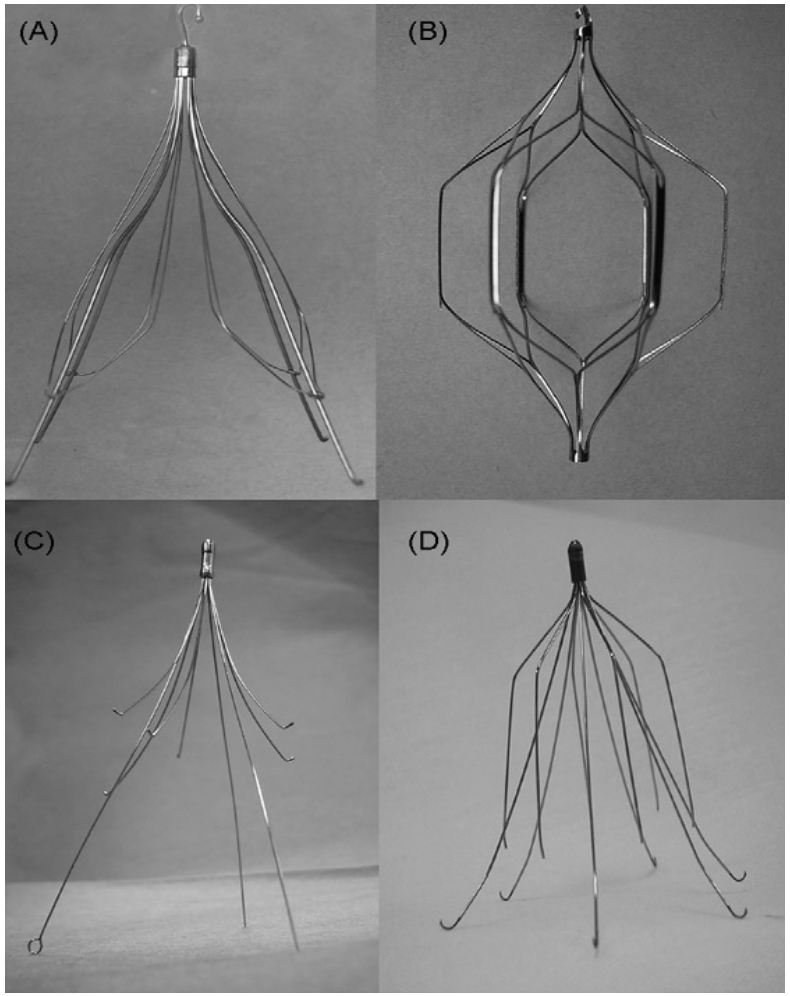
3. Surgery

IVC Filter

- **DVT, PE = anticoagulation contra-indicated**
- **Recurrent PE/DVT on therapeutic anticoagultion**
- **PE with right ventricular dysfunction**
- PE with poor pulmonary function
- PMT
- CDT with floating thrombus

IVC FILTER (endovenous therapy)

- NO DATA TO SUPPORT ROUTINE IVC FILTER PLACEMENT
- PROTACK et al – no increase in PE for CDT without filter
- Filter retrieval



PREPIC Trials prevention of recurrent pulmonary embolism by vena cava interruption

I

- IVC filters beneficial in for PE prevention in patients with proximal DVT
- ↑ Risk of DVT long-term
- **↑ Use of IVC filters**

NEJM 1998 (Decousous et.al)

II

- The use of retrievable inferior vena cava filters plus anticoagulation has no benefit over anticoagulation alone for PE prevention

JAMA Apr. 2015

(Mismetti et al)

Prophylaxis

Box 1. Risk factors for venous thromboembolism in the surgical patient (adapted from NICE guidelines on venous thromboembolism 2010).

Regard surgical patients and patients with trauma as being at increased risk of VTE if they meet **one** *of the following criteria*:

- Surgical procedure with a total anaesthetic and surgical time of >90 min, or >60 min if the surgery involves the pelvis or lower limb
- Acute surgical admission with inflammatory or intra-abdominal condition
- Expected significant reduction in mobility
- One or more of the risk factors:

  - Active cancer or cancer treatment
  - Age over 60 years
  - Critical care admission
  - Dehydration
  - Known thrombophilias
  - Obesity (body mass index >30 kg/m^2)
  - One or more significant medical co-morbidities, e.g. diabetes mellitus
  - Personal history or first-degree relative with a history of VTE
  - Use of hormone replacement therapy
  - Use of oestrogen-containing contraceptive therapy
  - Varicose veins with phlebitis

Box 2. Contraindications to chemical thromboprophylaxis (adapted from NICE guidelines on venous thromboembolism 2010).

- Active bleeding
- Acquired bleeding disorders (such as acute liver failure)
- Concurrent use of anticoagulants known to increase the risk of bleeding (such as warfarin with international normalised ratio >2)
- Lumbar puncture/epidural/spinal anaesthesia expected within the next 12 h
- Lumbar puncture/epidural/spinal anaesthesia within the previous 4 h
- Acute stroke
- Thrombocytopenia (platelets $< 75 \times 10^9$/l)
- Uncontrolled hypertension ($>$230/120 mmHg)
- Untreated inherited bleeding disorders (such as haemophilia and von Willebrand's disease)

THANK YOU!!!