VTE prophylaxis in nail surgery

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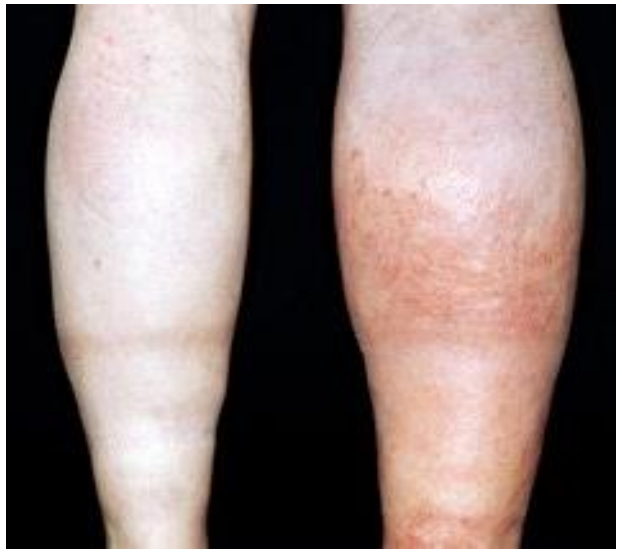
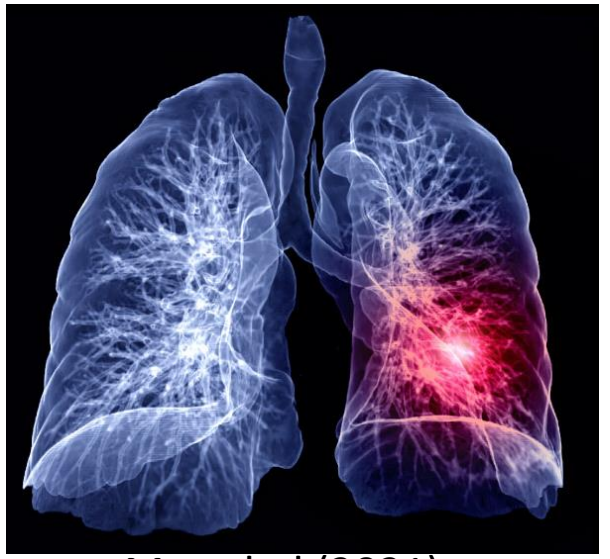
VTE

DVT



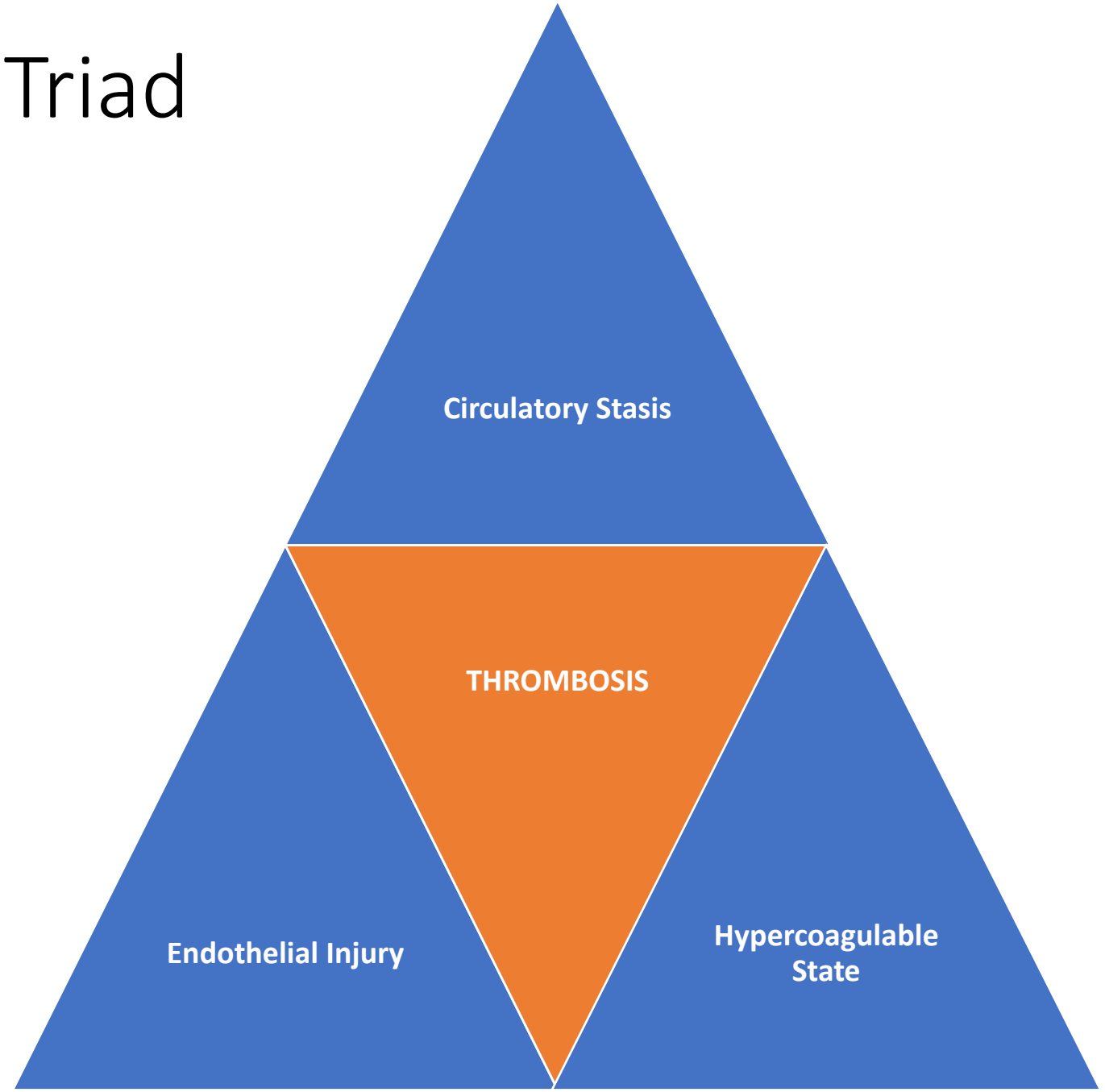
NHS (2020)

PE



Merschel (2021)

Virchow's Triad



Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism

NICE guideline [NG89] Published: 21 March 2018 Last updated: 13 August 2019

All patients

1.1.1 Assess all patients to identify the risk of venous thromboembolism (VTE) and bleeding (see the recommendation for all medical patients, for all surgical patients, for all pregnant women and all women who gave birth or had a miscarriage or termination of pregnancy in the past 6 weeks, for all people admitted to the critical care unit and for all acute psychiatric patients). **[2018]**

RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM (VTE)

All patients should be risk assessed on admission to hospital. Patients should be reassessed within 24 hours of admission and whenever the clinical situation changes.

STEP ONE

Assess all patients admitted to hospital for level of mobility (tick one box). All surgical patients, and all medical patients with significantly reduced mobility, should be considered for further risk assessment.

STEP TWO

Review the patient-related factors shown on the assessment sheet against **thrombosis** risk, ticking each box that applies (more than one box can be ticked).

Any tick for thrombosis risk should prompt thromboprophylaxis according to NICE guidance.

The risk factors identified are not exhaustive. Clinicians may consider additional risks in individual patients and offer thromboprophylaxis as appropriate.

STEP THREE

Review the patient-related factors shown against **bleeding risk** and tick each box that applies (more than one box can be ticked).

Any tick should prompt clinical staff to consider if bleeding risk is sufficient to preclude pharmacological intervention.

Guidance on thromboprophylaxis is available at:

National Institute for Health and Clinical Excellence (2010) Venous thromboembolism: reducing the risk of venous thromboembolism (deep vein thrombosis and pulmonary embolism) in patients admitted to hospital. NICE clinical guideline 92. London: National Institute for Health and Clinical Excellence.

http://www.nice.org.uk/guidance/CG92

This document has been authorised by the Department of Health
Gateway reference no: 10278

DH Department of Health

RISK ASSESSMENT FOR VENOUS THROMBOEMBOLISM (VTE)

Mobility – all patients (tick one box)	**Tick**		**Tick**		**Tick**
Surgical patient		Medical patient expected to have ongoing reduced mobility relative to normal state		Medical patient NOT expected to have significantly reduced mobility relative to normal state	
Assess for thrombosis and bleeding risk below				**Risk assessment now complete**	

Thrombosis risk			
Patient related	**Tick**	**Admission related**	**Tick**
Active cancer or cancer treatment		Significantly reduced mobility for 3 days or more	
Age > 60		Hip or knee replacement	
Dehydration		Hip fracture	
Known thrombophilias		Total anaesthetic + surgical time > 90 minutes	
Obesity (BMI >30 kg/m^2)		Surgery involving pelvis or lower limb with a total anaesthetic + surgical time > 60 minutes	
One or more significant medical comorbidities (eg heart disease;metabolic,endocrine or respiratory pathologies;acute infectious diseases; inflammatory conditions)		Acute surgical admission with inflammatory or intra-abdominal condition	
Personal history or first-degree relative with a history of VTE		Critical care admission	
Use of hormone replacement therapy		Surgery with significant reduction in mobility	
Use of oestrogen-containing contraceptive therapy			
Varicose veins with phlebitis			
Pregnancy or < 6 weeks post partum (see NICE guidance for specific risk factors)			

Bleeding risk			
Patient related	**Tick**	**Admission related**	**Tick**
Active bleeding		Neurosurgery, spinal surgery or eye surgery	
Acquired bleeding disorders (such as acute liver failure)		Other procedure with high bleeding risk	
Concurrent use of anticoagulants known to increase the risk of bleeding (such as warfarin with INR >2)		Lumbar puncture/epidural/spinal anaesthesia expected within the next 12 hours	
Acute stroke		Lumbar puncture/epidural/spinal anaesthesia within the previous 4 hours	
Thrombocytopaenia (platelets< 75x10^9/l)			
Uncontrolled systolic hypertension (230/120 mmHg or higher)			
Untreated inherited bleeding disorders (such as haemophilia and von Willebrand's disease)			

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1.1.6 Balance the person's individual risk of VTE against their risk of bleeding when deciding whether to offer pharmacological thromboprophylaxis to surgical and trauma patients. **[2018]**

1.3.5 Use anti-embolism stockings that provide graduated compression and produce a calf pressure of 14 mmHg to 15 mmHg. (This relates to a pressure of 14 mmHg to18 mmHg at the ankle and is in line with the British Standard Institution's BS 661210:2018 Specification for graduated compression hosiery, anti-embolism hosiery and graduated support hosiery.) **[2010]**

1.10.3 Do not routinely offer pharmacological or mechanical VTE prophylaxis to people undergoing a surgical procedure with local anaesthesia by local infiltration with no limitation of mobility. **[2010]**

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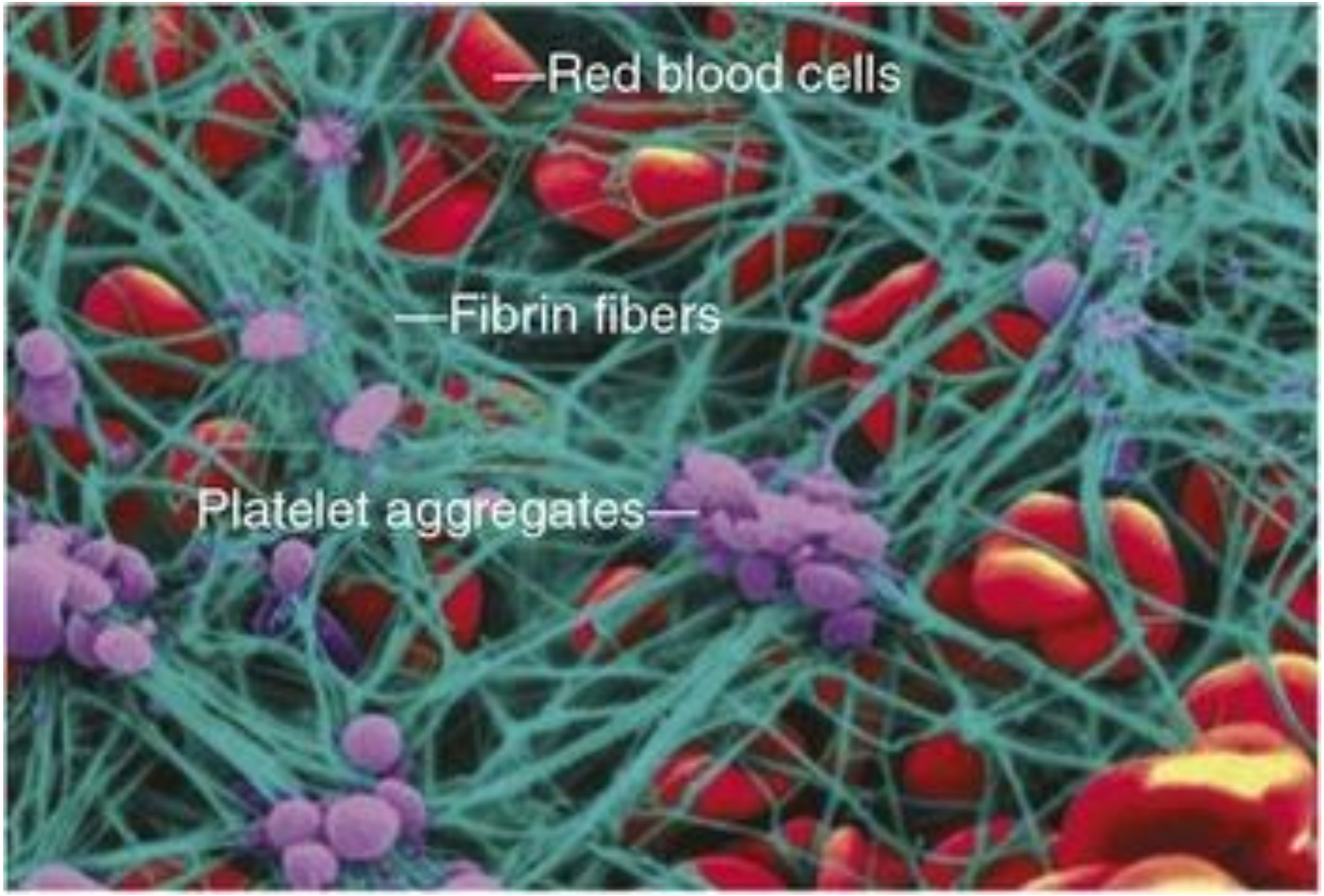
Foot and ankle orthopaedic surgery

1.11.14 Consider pharmacological VTE prophylaxis for people undergoing foot or ankle surgery:

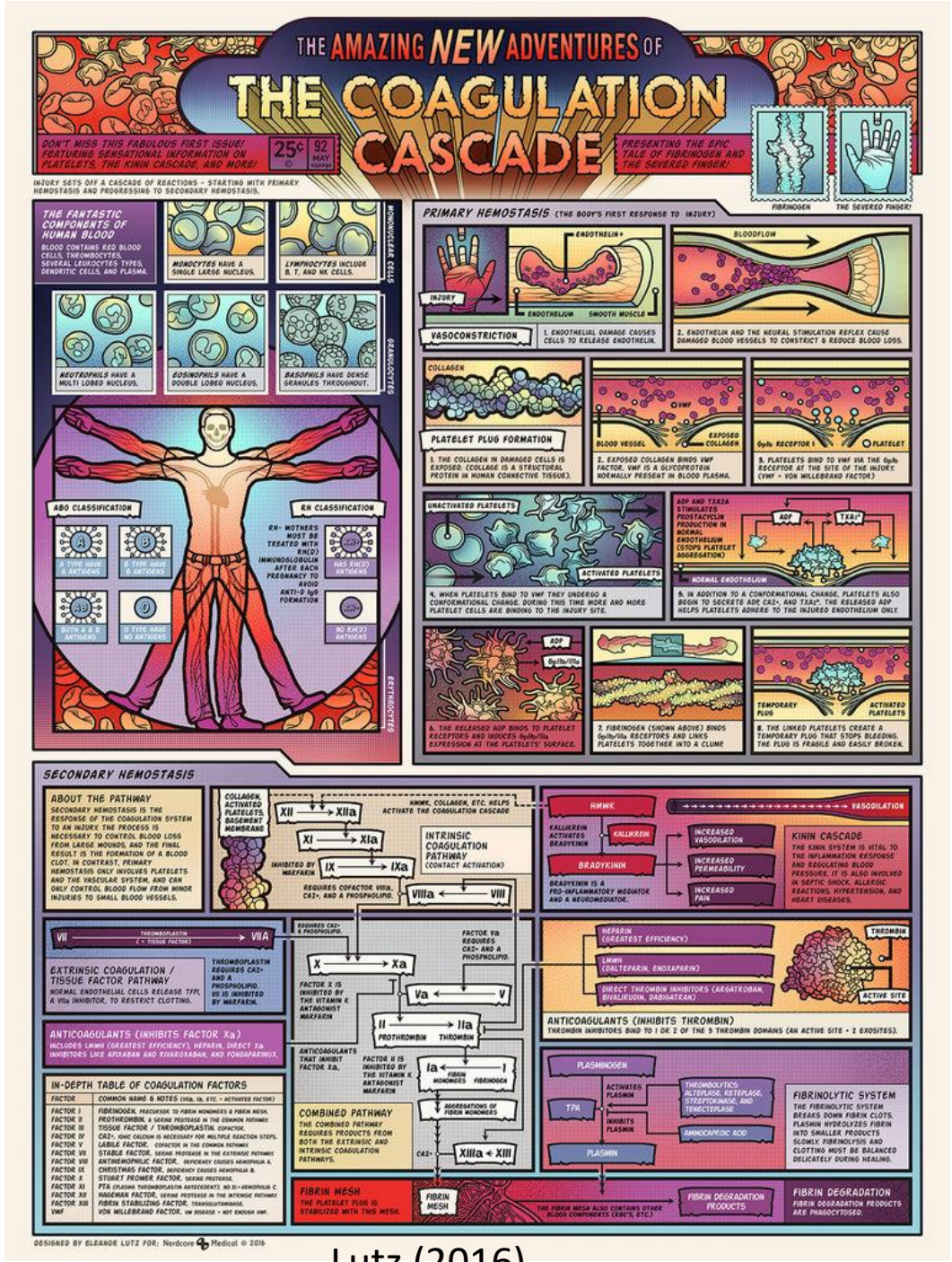
- that requires immobilisation (for example, arthrodesis or arthroplasty); consider stopping prophylaxis if immobilisation continues beyond 42 days (see the recommendation on lower limb immobilisation) **or**
- when total anaesthesia time is more than 90 minutes **or**
- the person's risk of VTE outweighs their risk of bleeding. **[2018]**

Lower limb immobilisation

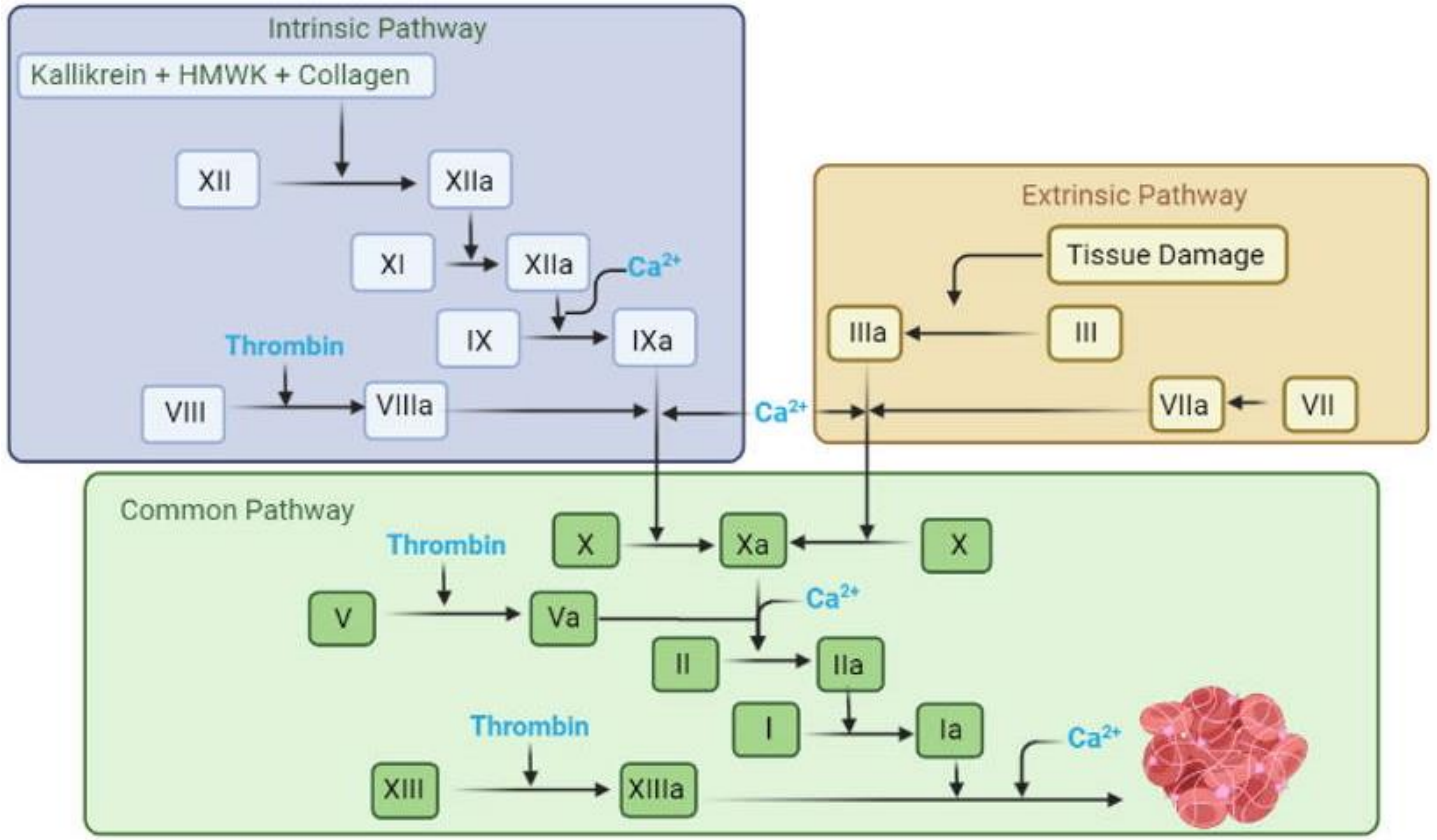
Any clinical decision taken to manage the affected limb in a way that would prevent normal weight-bearing status or use of that limb, or both.



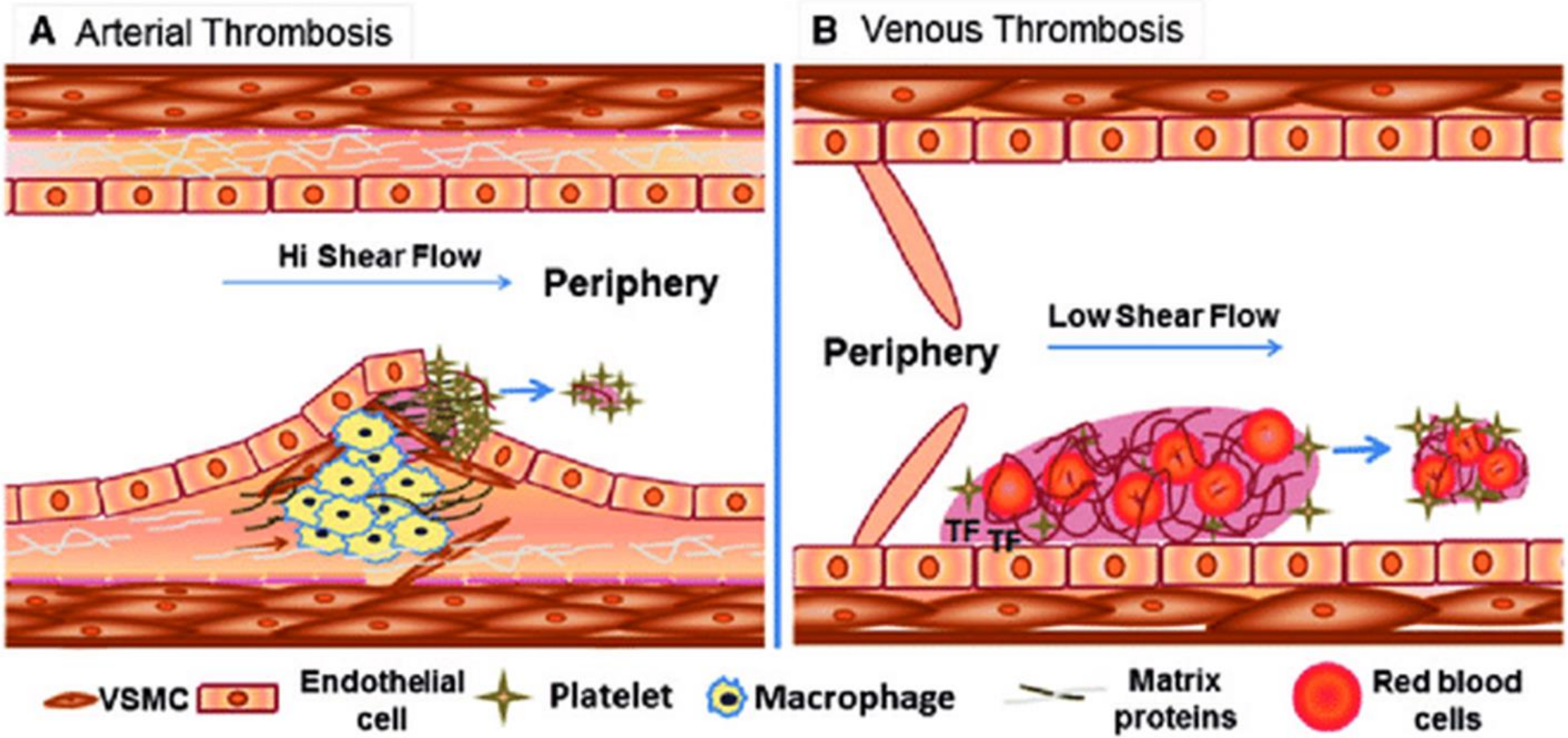
Moores et al (2012)



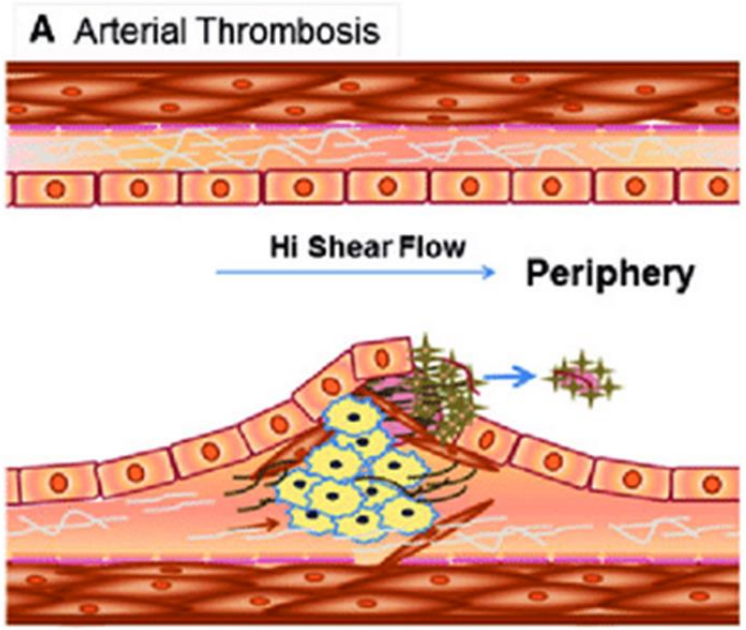
Lutz (2016)



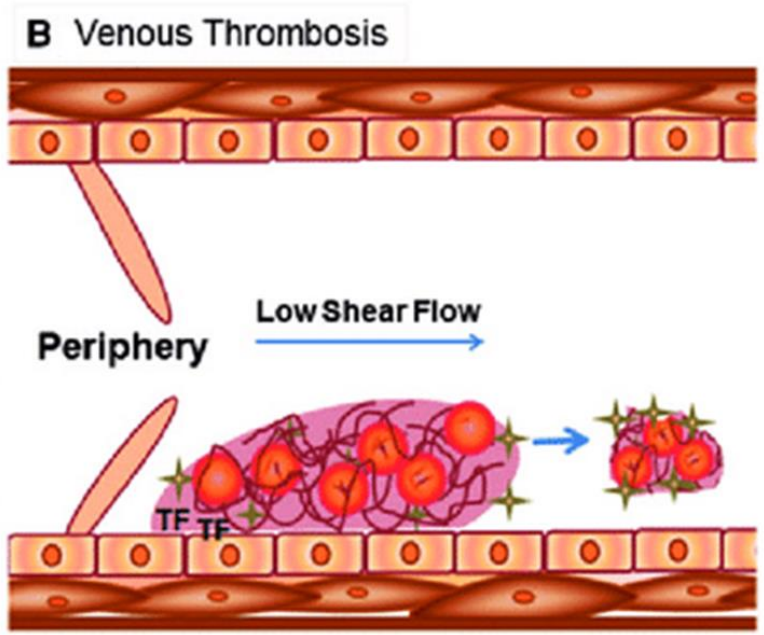
Suresh (2023)



Koupenove et al (2017)



Reducing risk



Antiplatelets

- Aspirin
- Clopidogrel
- Dipyridamole
- Ticagrelor
- Cangrelor
- Prasugrel

Anticoagulants

- Vitamin K antagonists
  - Warfarin
  - Acenocoumarol
  - Phenindione

DOACs

- Apixaban
- Dabigatran
- Edoxaban
- Rivaroxaban

Anti-coagulants

- **Vitamin K agonists**
  - VTE prophylaxis e.g. in heart disease, AF, TIA
  - Long half-life
  - Reversed by vitamin K
- **DOACs**
  - VTE prophylaxis post-surgery/TIA/DVT etc.
  - Much shorter half-life than Vitamin K agonists
  - Reversed by Andexanet (Apixaban & Rivaroxaban) or Idarucizumab (Dabigatran)
- **Heparin**
  - VTE prophylaxis & treatment
  - Inhibits coagulation factors including thrombin & factor X
  - Rapid action, short duration
- **Low-molecular Weight Heparin**
  - VTE prophylaxis and treatment
  - Longer half-life than unfractioned heparin
  - Lower risk of thrombocytopaenia
- **Heparinoids**
  - ↓ risk of DVT post-surgery
  - Mixtures of heparin derivatives
- **Fondaparinux**
  - VTA prophylaxis in major surgery
  - Acute symptomatic superficial-vein thrombosis
  - Inhibits factor Xa
- **Argatroban**
  - Used in patients with heparin induced thrombocytopaenia
  - Direct thrombin inhibitor
- **Hirudins**
  - Used in percutaneous coronary intervention
- **Epoprostenol**
  - ↓ platelet aggregation in dialysis
  - Short ½ life so given by continuous infusion

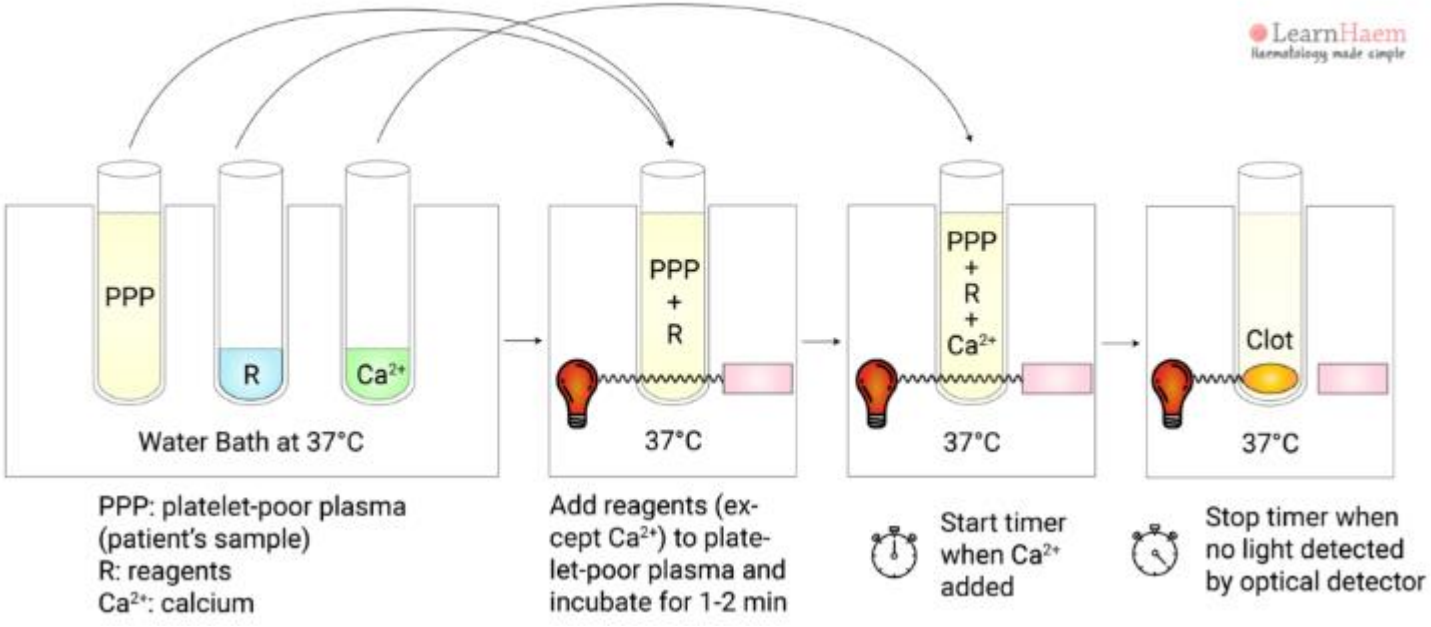
https://www.mentimeter.com/app/presentation/alwj5gonoh5sgf2phyfeawdsk7xhh1bh/cbqa8xp2peih/edit

INR

- INR – International Normalised Ratio
- Time taken for blood to clot
- Normal = 1
- Target usually 2.5 – 3.5

- Stopping warfarin not usually justified for skin surgery
- INR <3.5 – no significant bleeding risk

(Bray, Adam & Wernham 2023)



Ying et al 2022

Bleeding risk can refer both to the risk *of* bleeding and the risk *from* bleeding. We recommend the continuation of most anti-thrombotic agents for most skin surgery procedures. This is on the basis of evidence of a very low risk of morbidity and mortality from peri-operative bleeding, versus a variable risk of highly morbid or fatal thrombotic events associated with cessation.[3-10] Many surgeons already avoid stopping any antithrombotic drugs pre-operatively.[8] However the safety of this approach does depend on careful case selection, patient preparation and support, and the choice of therapy. Many high bleeding risk procedures could potentially be avoided altogether.

(Alcalay & Alkalay R (2004), Bordeaux et al (2011), Bray, Adam & Wernham (2023), Bray A, Wernham (2022), Iyengar et al (2020), Isted et al (2018), Lewis KG & Dufresne (2008), Otley (2003), Palamaras &Semkova (2015)

An update for UK podiatrists performing toenail surgery on patients who are taking antithrombotic medications: it's about bleeding time

Ian N Reilly[1,2]. BSc, MSc, FCPodS, FFPM RCPS(Glasg). Consultant Podiatric Surgeon
Toby Blandford[3]. BSc(Hons). Private Practitioner

Abstract

Nail surgery for the permanent removal of all or part of the nail unit can be performed via incisional or physically ablative techniques for conditions such as ingrown, mycotic, or dystrophic toenails. In the United Kingdom podiatric community, where phenol techniques are the standard of care for ablation of the matrix, there remains confusion about the management of patients undergoing nail surgery who are concurrently taking antithrombotic medication(s). The aim of this paper was to review the literature describing treatment strategies for antithrombosed patients undergoing nail surgery. However, having found limited evidence, the authors considered relevant and associated literature in the field of cutaneous/dermatological surgery and extrapolated those findings for patients undergoing nail avulsion surgery. A case-by-case risk assessment is warranted in all patients but as a general rule, the podiatrist can perform nail surgery without the patient ceasing their antithrombotic medication.

J Plast Reconstr Aesthet Surg. 2018 Apr;71(4):455-467. doi: 10.1016/j.bjps.2017.11.024. Epub 2017 Nov 28.

Bleeding on the cutting edge: A systematic review of anticoagulant and antiplatelet continuation in minor cutaneous surgery

Alexander Isted [1], Lilli Cooper [2], R James Colville [2]

Results: 30 studies included data from over 14,000 patients, of which more than 5000 took regular AC/AP therapy. Thromboembolic events were rare but carry high morbidity and even mortality, and in these studies three events were associated with cessation of AC/AP. There was no increase in haemorrhagic complications in patients taking aspirin monotherapy, but evidence is conflicting regarding warfarin and clopidogrel monotherapy, which shows a small increase in rate of bleeding complications. However, no increase in wound dehiscence, graft failure, wound infection or cosmetic outcome was seen. Too few studies investigated DOAC use to draw reliable conclusions. Data are sparse in comparing multiple versus single AC/AP regimens. Use of skin grafts or local flaps may have a greater complication rate than direct closure in patients on one or more AC/AP, but evidence is limited.

Conclusion: A case-by-case risk assessment is warranted in all patients but where possible, clinicians should prioritise meticulous haemostasis over cessation of agents.

Authors	Study title	Outcomes
Blasdale & Lawrence (2008)	Perioperative international normalized ratio level is a poor predictor of postoperative bleeding complications in dermatological surgery patients taking warfarin	• No increase in intra-operative bleeding • 8% moderate or severe post-operative bleeding compared to no significant bleeding in control group • Post-operative bleeding risk even increased when INR in therapeutic range
Bordeaux et al (2011)	Prospective evaluation of dermatological surgery complications including patients on multiple antiplatelet and anticoagulant medications	• Patients on both clopidogrel and warfarin 40 times more likely to have bleeding complications • All complications resolved without sequalae • Anticoagulants and antiplatelets should be continued to avoid adrvese thrombotic events
Callahan et al (2012)	The management of antithrombotic medication in skin surgery	• Concerns re. bleeding but no life-threatening haemorrhage • Potentially fatal cardiovascular events after cessation of antithrombotics
Isted et al (2018)	Bleeding on the cutting edge: a systematic review of anticoagulant and antiplatelet continuation in minor cutaneous surgery	• No increase in haemorrhagic complications in patients on aspirin monotherapy • Small increased risk in rate of bleeding complications in warfarin and clopidogrel monotherapy • No increase in wound dehiscence/graft failure/infection/cosmetic outcome • Sparse data on multiple vs single regimens and DOACs

(Adapted from Reilly & Blandford 2021)

ROYAL COLLEGE of PODIATRY

The use of anticoagulants should not prevent nail surgery, assuming the patient is suitable in all other respects, although the patient should be alerted that post-operative bleeding may be prolonged and their advised aftercare regime modified to reflect this. Recorded INR (International Normalised Ratio - a measure of the clotting time) values vary in accordance with the patient's individual condition and the higher the INR value, the longer the blood will take to form a clot; in many anti-coagulated cases the INR is maintained by warfarin therapy between 2-3, meaning that the clotting process will take approximately 2-3 times as long as normal (i.e. approximately 10-15mins, rather than the normal 5 minutes). Stopping the use of anticoagulant medication or avoiding surgery is not usually justified in these patients (see **BSDS Guidance**).

Risk factors for significant post-operative bleeding events (in no particular order)

General patient factors

- Previous post-op bleeding episode
- Unable or unwilling to rest post-op
- Poor home support if bleeds
- Bleeding tendency
- Age >65

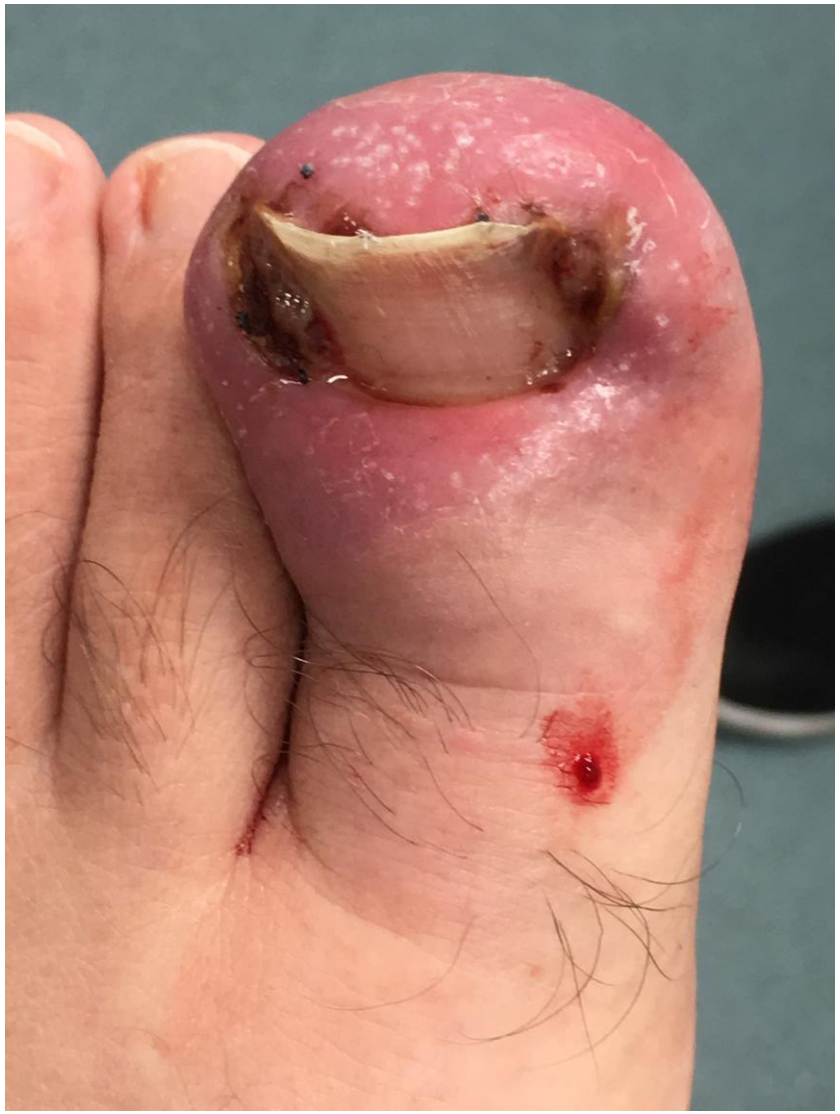
General risk of bleeding by procedure type (highest to lowest risk):

Secondary intention wounds following excision
Local flaps
Grafts
Direct closure
Curettage and electrocautery

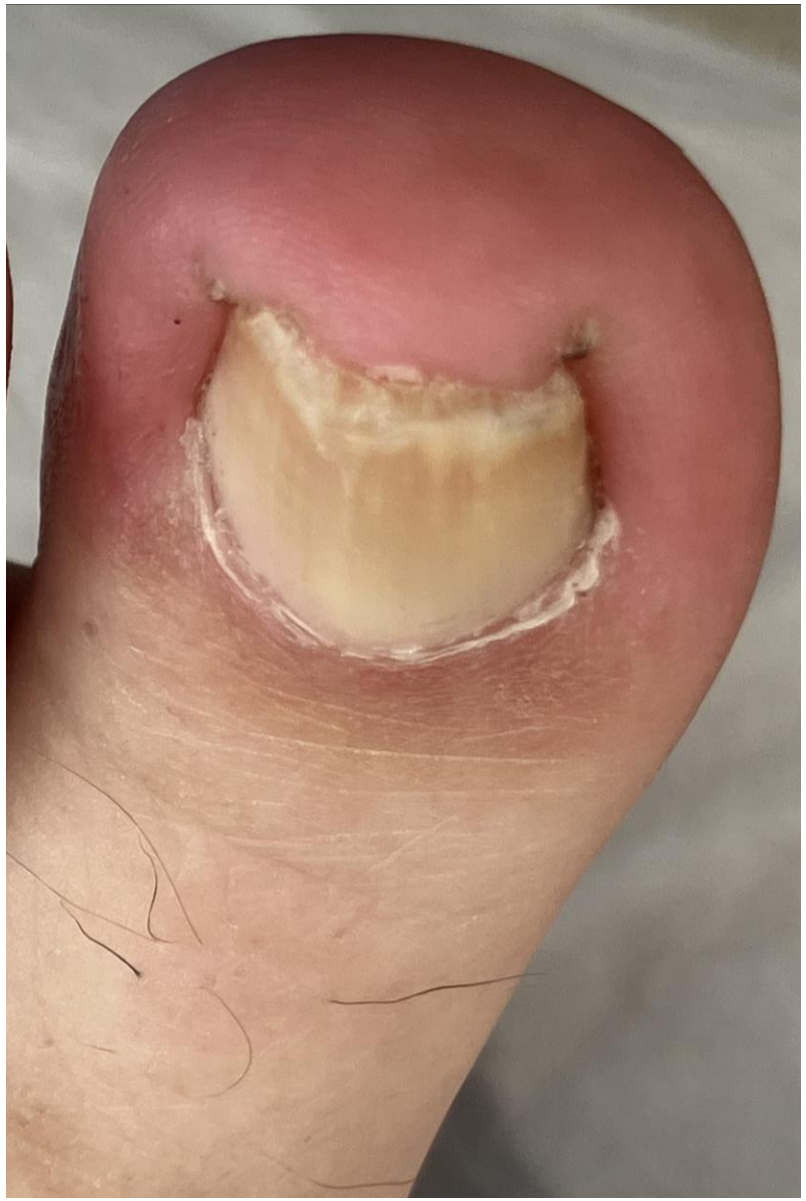
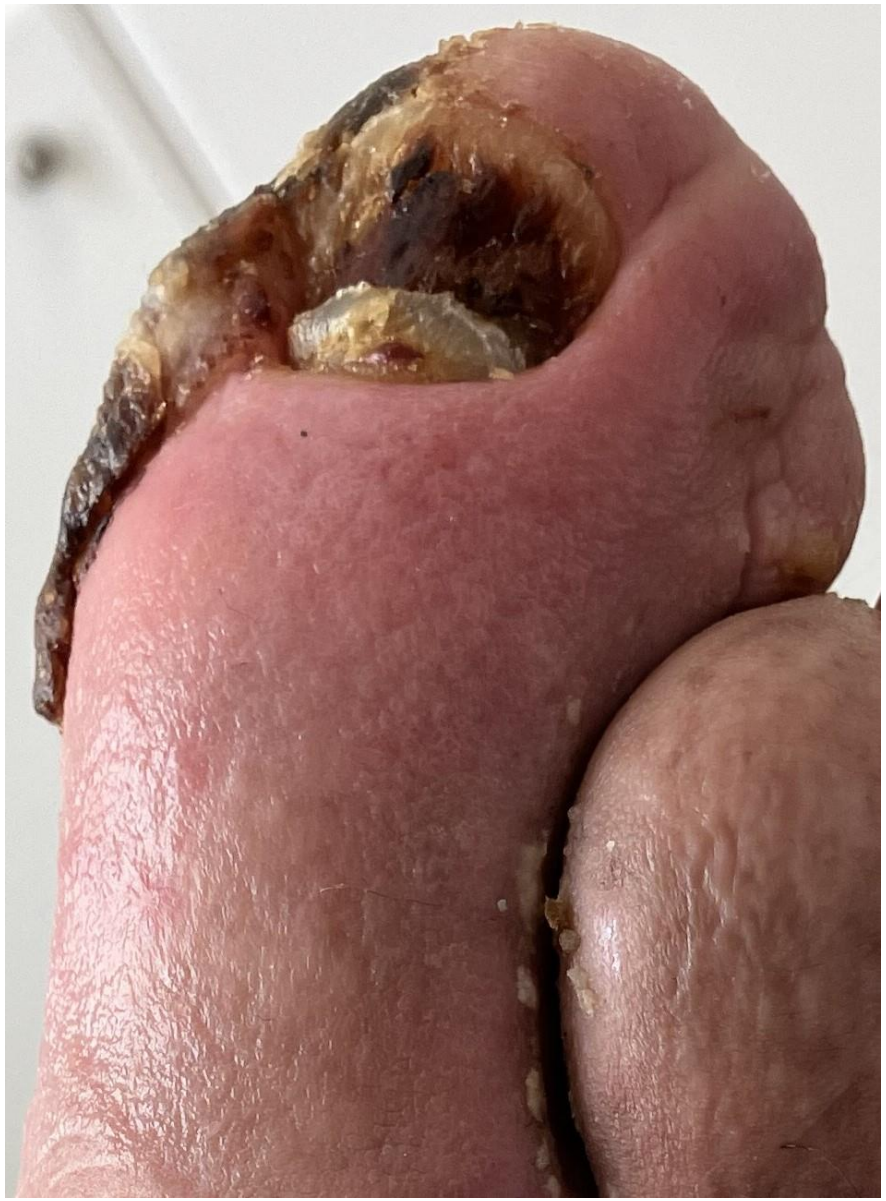
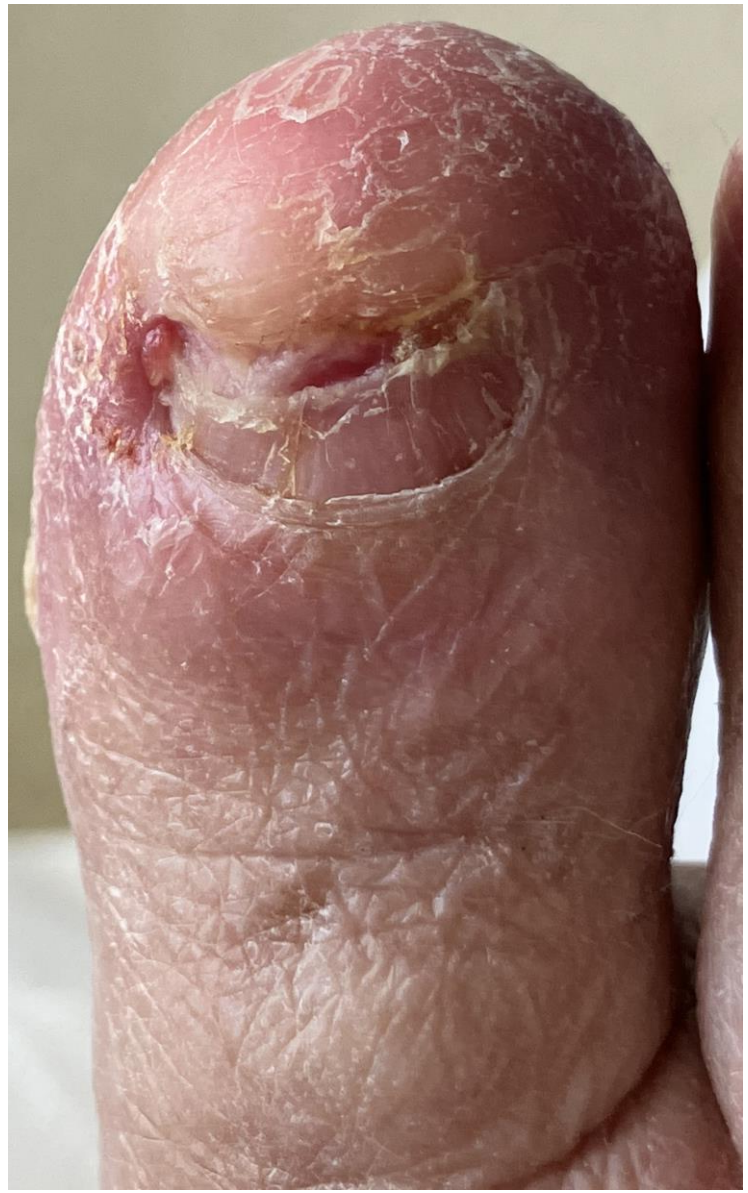
(Bray, Adam & Wernham 2023)

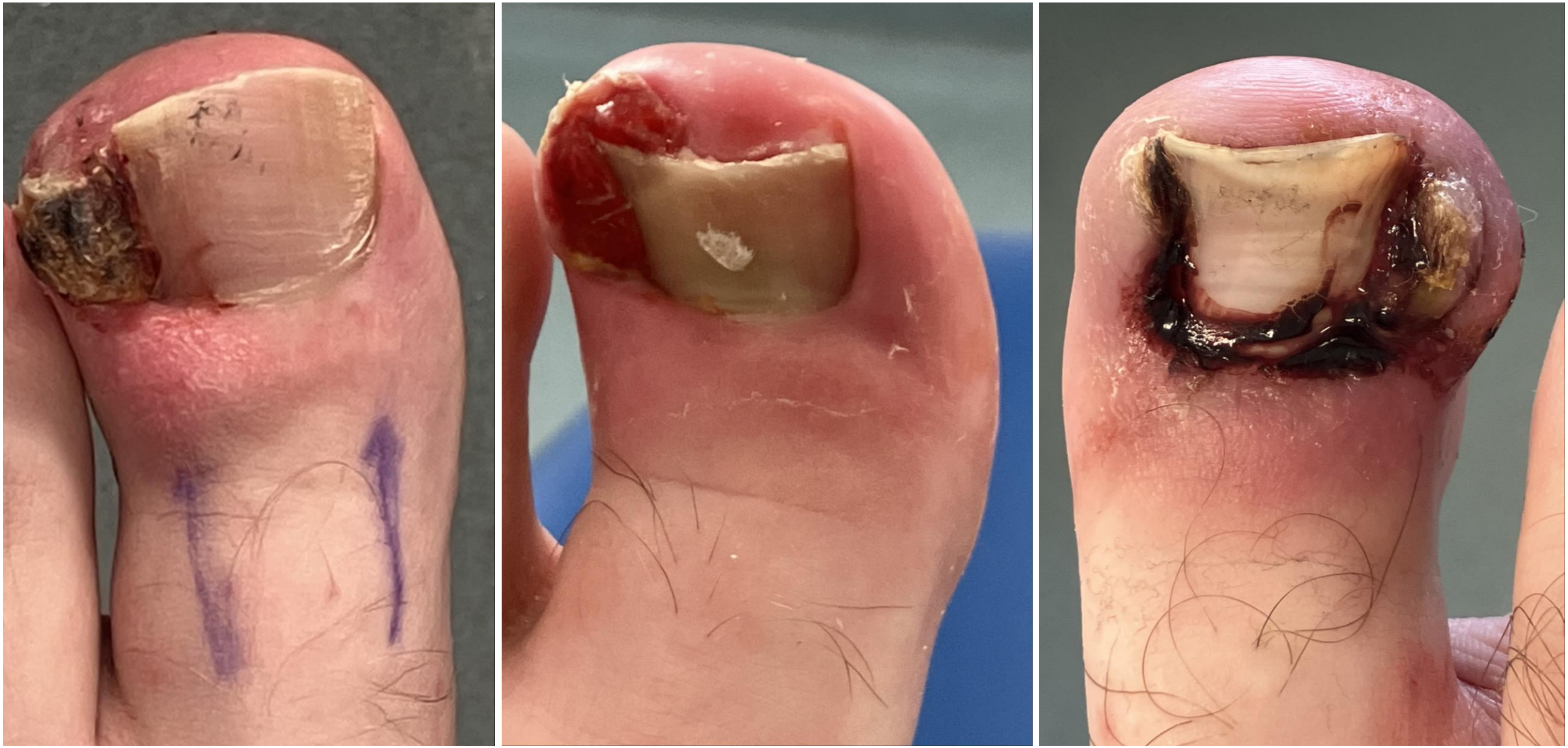
Patient selection

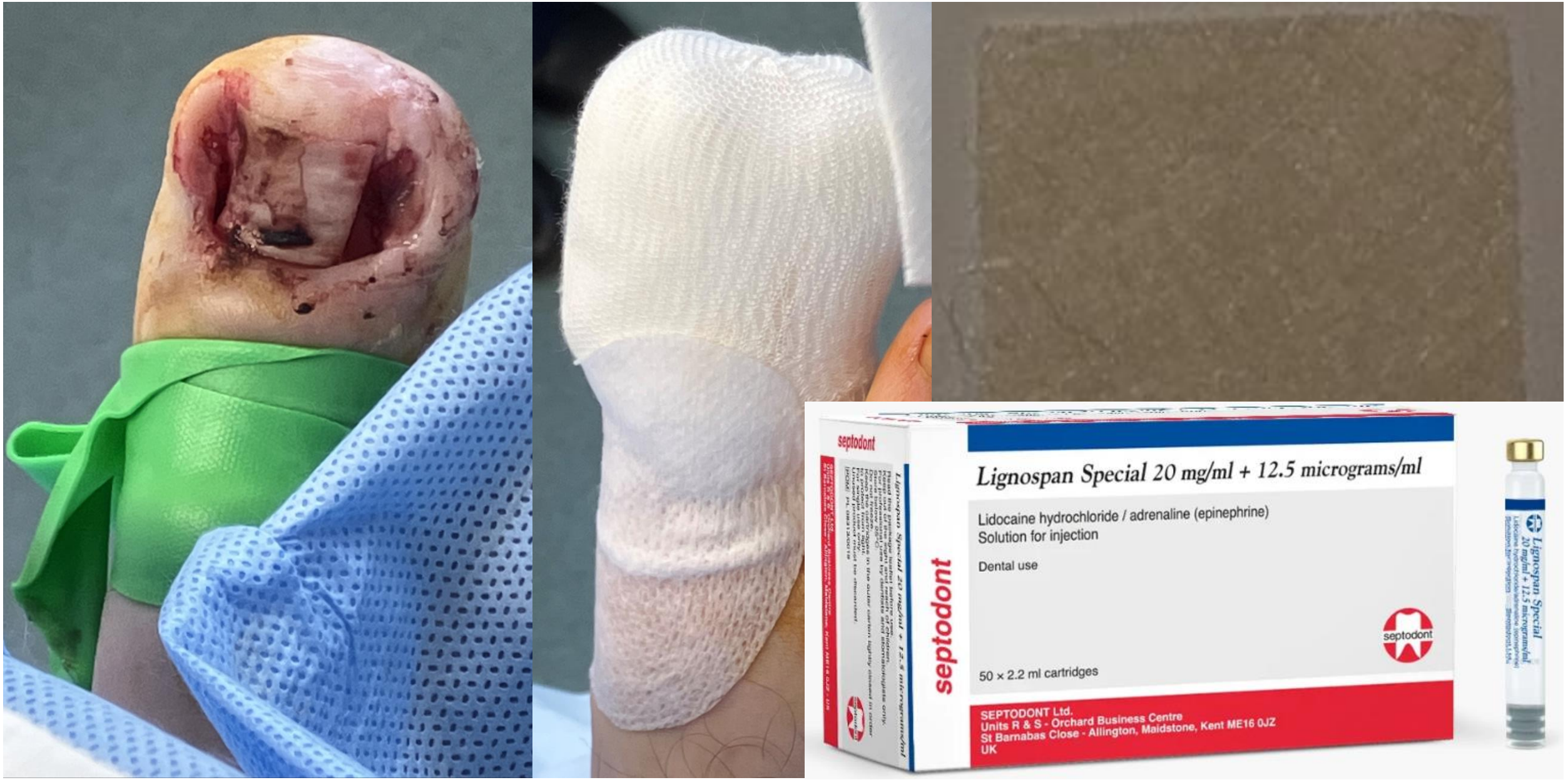
History
- Medical
- Surgical
- Drug



Assessment
- Vascular
- Neurological
- Social
- Clinical need

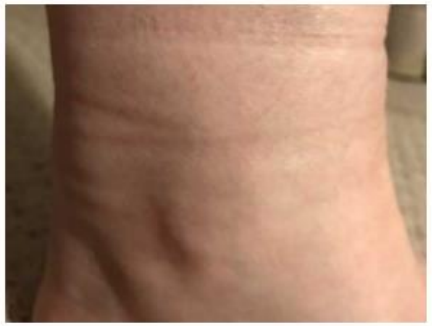






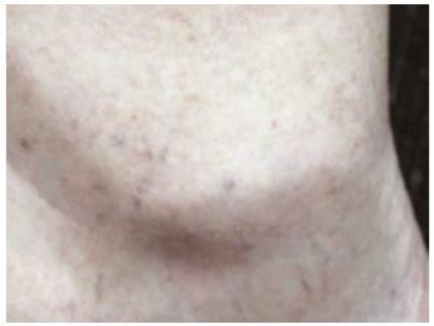


Septodont (2023)

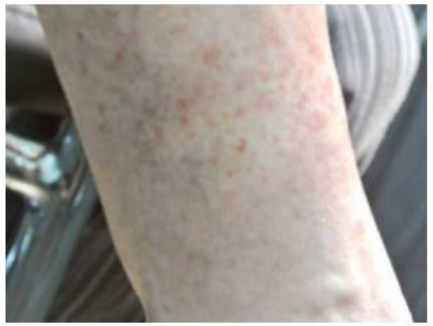
Mechanical prophylaxis



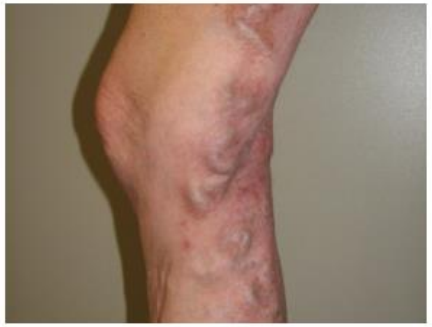
Mild venous insufficiency



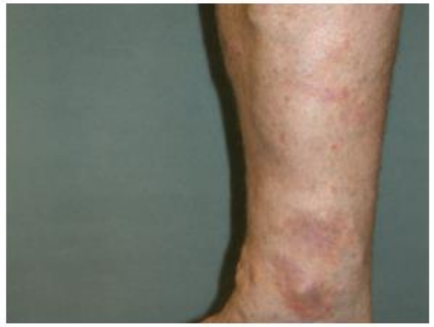
Corona phlebectatica paraplantaris



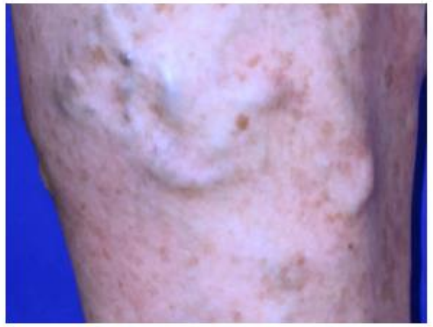
Pinpoint haemosiderin pigmentation



Haemosiderosis and varicose veins

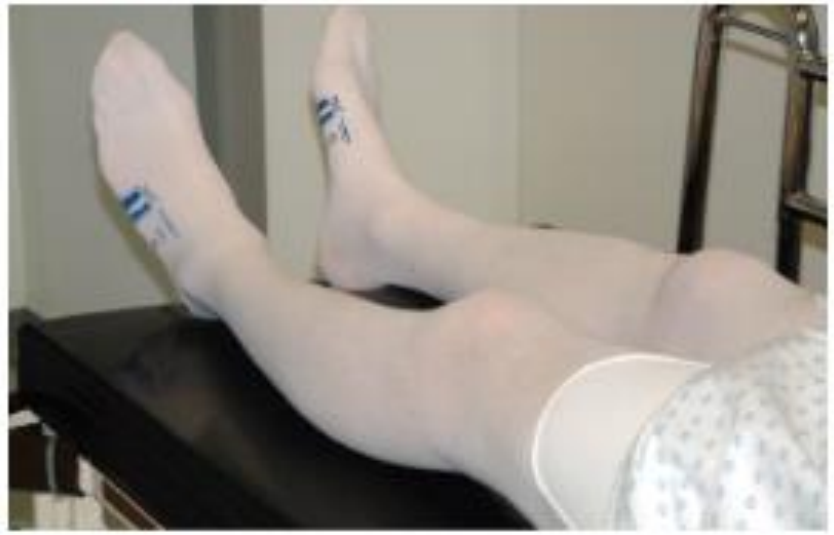


Pressure erythema over incompetent valves

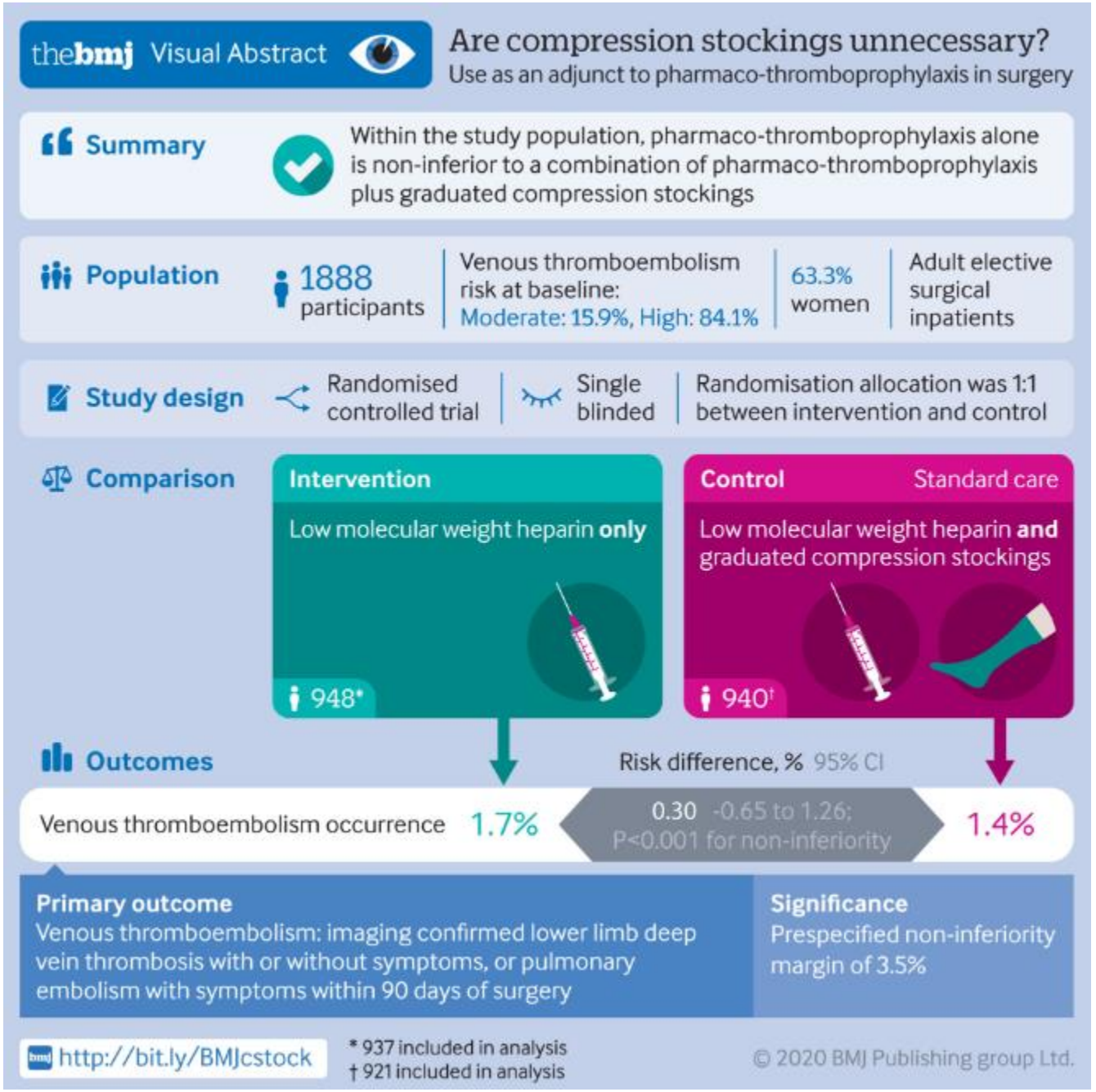


Haemosiderosis and varicose veins

Caesar (2020)



Gee & Doyle (2015)

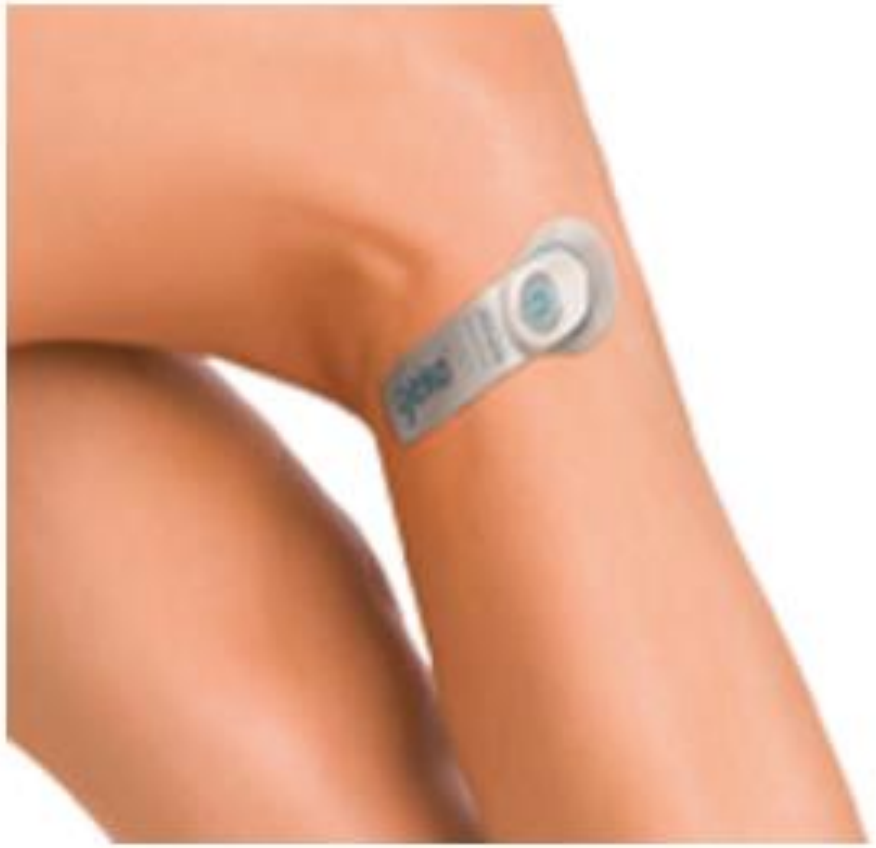


Shalhoub et al (2020)

The Future

- Peroneal nerve neuromuscular stimulation

(Tucker et al 2010)



Geko - Queen Mary University of London (2013)

- AI

(Selby et al, 2018); Wang et al, 2021)

? Risk prediction
? Clinical decision support
? Monitoring and early detection
? Personalised treatment plans
? Data integration and analysis
? Patient education and engagement

(Chat GPT 2023)

https://www.mentimeter.com/app/presentation/alz8pprj86kpunvxczk5m4b9mnwmimrr/pztj5gyr3nqs/edit

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