

ASPIRE Junior: Peripheral Artery Disease

PAD: occlusive disease of arteries – diminished blood supply w/ongoing tissue demand

Usually atherosclerotic or thromboembolic

Presentation: Fontaine / Rutherford

	FONTAINE		RUTHERFORD		
	Stage	Clinical	Grade	Category	Clinical
Severity	I	Asymptomatic	0	0	Asymptomatic
	IIa	Mild claudication	I	1	Mild claudication
	IIb	Moderate-severe claudication	I	2	Moderate claudication
			I	3	Severe claudication
	III	Ischemic rest pain	II	4	Ischemic rest pain
	IV	Ulceration or gangrene	III	5	Minor tissue loss
			IV	6	Ulceration or gangrene

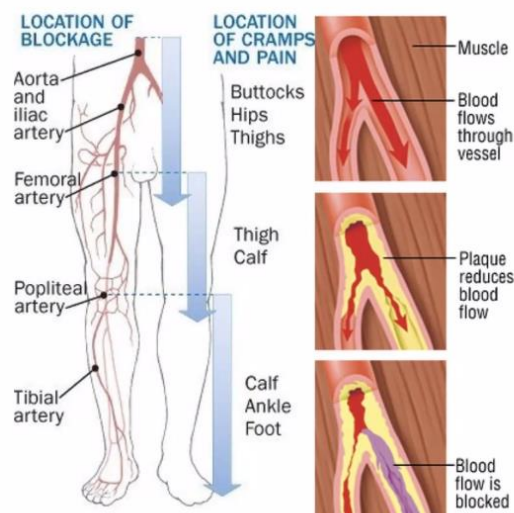
NEW Virtual Background is available



ROULEAUX CLUB
UK Vascular Trainees' Association

PVD- Presentation

- Pain – Claudication (reproducible pain on walking), rest pain – worse of elevating the leg, improved by hanging leg down.
- Paraesthesia- worse on elevating the legs
- Erectile dysfunction
- Weak/ absent pulses



Rest pain usually worse at night d/t lack of gravity

Location of pain depends on location of obstruction

PVD- Presentation

- Skin – pale and cool / dependent rubor
- Trophic changes- Hairloss, shiny skin, muscle atrophy, diminished nail growth
- Ulceration

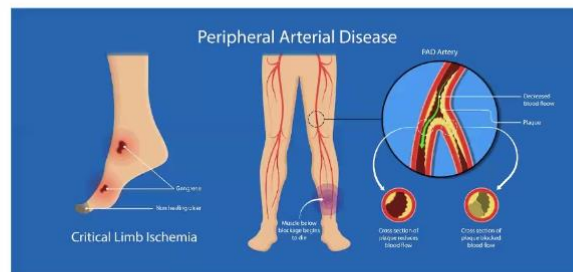


Ulcers usually small and punched out – bottom of foot or between toes

Chronic Limb Threatening Ischaemia (CLTI)

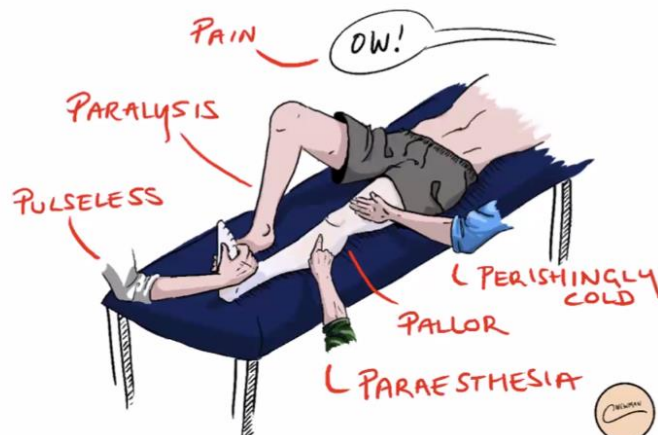
A threshold of values of impaired circulation. Syndrome – Presence of PAD, in combination with **rest pain**, **gangrene** or leg ulceration > 2 weeks duration

Associated with increased risk of **mortality**, **amputation** or **impaired quality of life**.



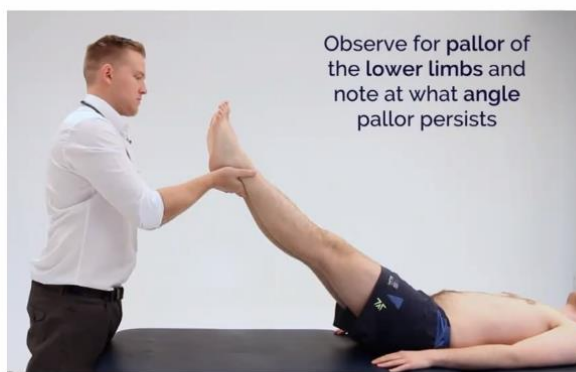
CLTI is new term instead of critical limb ischaemia

PVD- Acute Limb ischaemia



Needs to be acted on w/in 6 hrs to save limb!

- Through inspection (Scars/ skin/ tissue appearance/ ulcers/ nails/ hair loss/ muscle wasting/ colour changes)
- Palpation (pulses/ temperature/ capillary refill/ sensation/ motor function/ aneurisms/)
- ABPI (SBP ankle/ SBP brachial)
- Buerger's test



Buerger's – elevate feet for 2 minutes – if they go pale, then the patient has PAD – after elevation, allow patient to hang leg down to look for reactive hyperaemia

Do basic blood tests – remember to look for coagulopathy

Imaging –

Duplex ultrasound – operator dependent – limited by body habitus

MRA

CTA

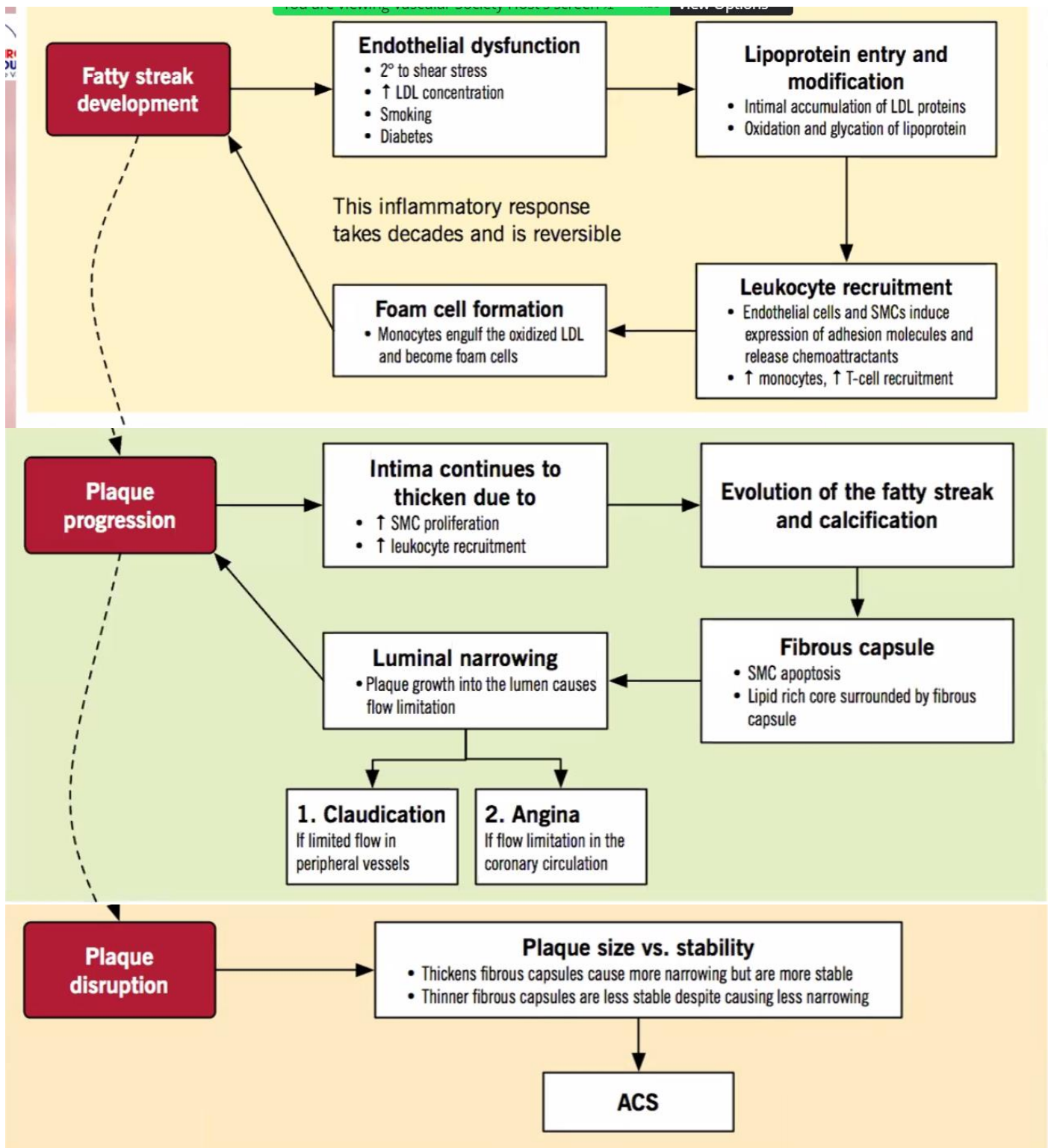
DSA (Digital Subtraction Angiogram)

Vasc Risk Factors and Medical Management

Atherosclerosis

- “A disease of the arteries characterized by the deposition of fatty material on their inner walls”
- Multiple vascular beds
- >202 million people worldwide
- 15% of those >70 years old
- Underdiagnosed and often poorly managed
- Increasing problem due to risk factors

Affects the whole body – not just one part of the body



ACS – Acute on chronic ischaemia / stroke

Risk Factors

- Smoking
- Obesity
- Diabetes
- Hypertension
- Aging population

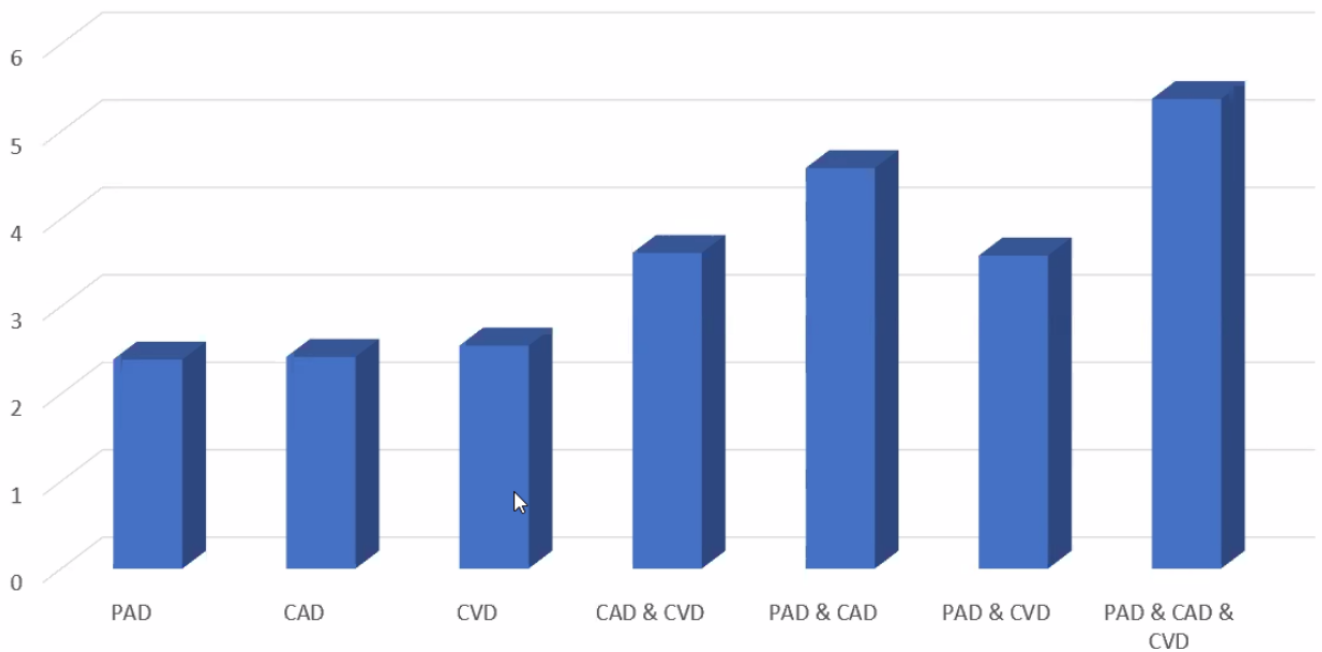
UNDATION
Vascular Medicine

UK Vascular Trainees'

What are the risks?

- REACH registry (Reduction of Atherothrombosis for Continued Health)
- 68,000 at risk patients globally
- Risks of all cause mortality and cardiovascular event at 1 year

Mortality (all cause)



Patients w/all 3 have a higher mortality risk – Singular cardiovascular event higher w/PAD cohort

Best Medical Therapy

- Secondary Prevention of Cardiovascular Risk Factors
- NICE Guidelines
- Smoking Cessation
- Clopidogrel 75mg
- Atorvastatin 80mg
- Control of Hypertension
- Glycaemic Control
- Exercise

NICE Guidelines recommend BMT b4 surgery

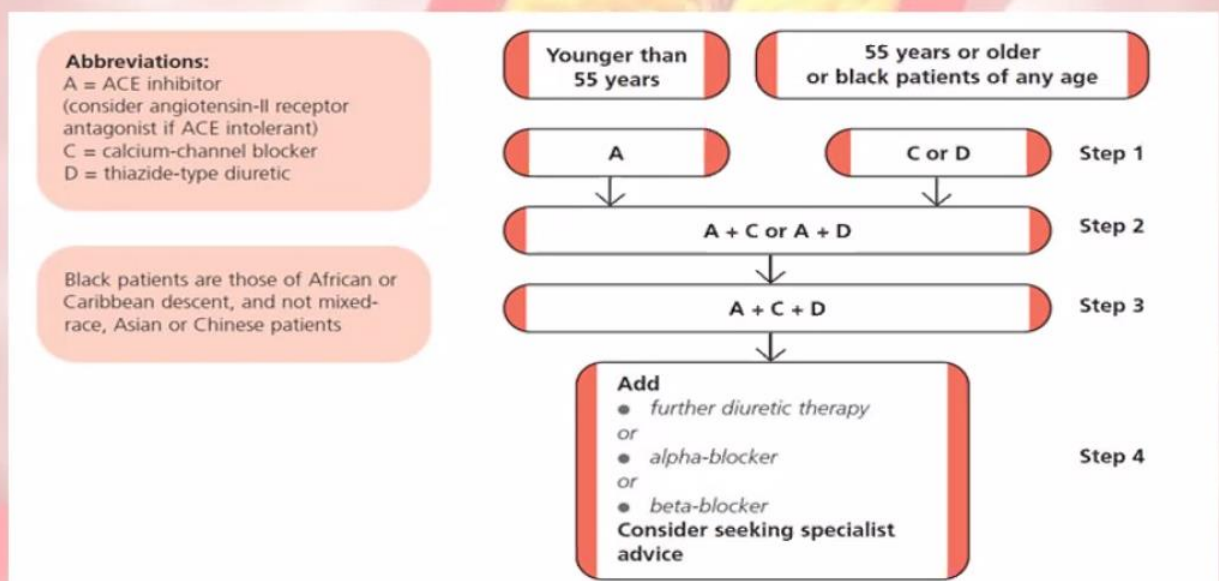
Smoking cessation MOST important!! – can prevent progression to CLTI – referral to cessation program doubles cessation rate – key is getting long term smoking cessation results!

Antiplatelets – reduces CV mortality by 46%, fewer side effects than aspirin, but increased bleeding risk

Statins – STRONG positive correlation b/w cholesterol and incidence of cardiovascular disease – lower the LDL cholesterol – improves 1yr limb salvage rates, and walking distance @ 1 month

Management of hypertension

- Recommendation – BP <140/90mmHg
- CV risk doubles for every 20/10mmHg above 115/70mmHg



Get BP as low as possible w/in reason

Management of Diabetes

- Diabetes increases risk of PAD 2-3-fold
- Undiagnosed diabetes – up to 12% of new PAD patients
- 1% rise in HbA1c – 28% increase in PAD & 28% increased mortality
- 1% reduction – 43% reduction in amputation or death from PAD
- Lifestyle management
 - Weight reduction – BMI >40/>35 & diabetes consideration of bariatric surgery
 - Diet
 - Exercise

Exercise

- NICE guidelines
 - 2 hours supervised exercise/week for 3 months
 - Exercise to maximal pain
- Benefits
 - Develop collateral supply
 - Improve overall CV health
 - Weight loss
 - Improve diabetes/hypertension
- Limitations as to where is able to offer the service

Conclusions

- Vascular disease is a systemic disease
- PAD is only part of the whole picture
- Secondary prevention helps with PAD
- Predominantly a preventative measure for worsening of atherosclerotic disease elsewhere

Intervention for PAD:

Options for Intervention

- Aim – re-establish blood flow.
- What?
 - Re-open pre-existing vessel
 - Create a new substitute vessel
- How?
 - Endovascular
 - Open Surgery
- When?
 - Claudicant? CLTI?
 - Risk vs benefit.
 - Not too late but not too soon!

NICE Guidelines

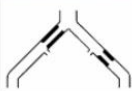

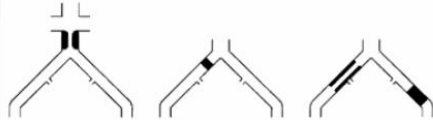
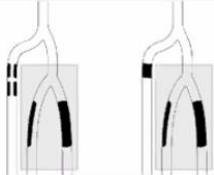

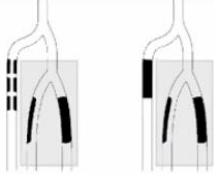
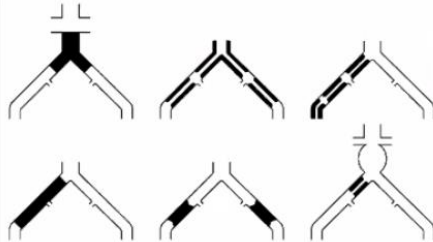

TransAtlantic intersociety Consensus

European Guidelines – ESVS

AHA

When to intervene?

- Intermittent claudication – exercise more effective – risk vs benefit – risk of limb loss
- CLTI – rest pain / ulceration – risk vs benefit now changed – risk of limb loss w/ or w/o intervention – implement w/BMT and lifestyle changes – hold off as long as possible.

TASC A lesions <ul style="list-style-type: none"> Unilateral or bilateral CIA stenoses Unilateral or bilateral single short (≤ 3 cm) EIA stenosis 		TASC A lesions <p>Single focal stenosis, ≤ 5 cm in length, in the target tibial artery with occlusion or stenosis of similar or worse severity in the other tibial arteries.</p>	
TASC B lesions <ul style="list-style-type: none"> Short (≤ 3 cm) stenosis of the infrarenal aorta Unilateral CIA occlusion Single or multiple stenosis totaling 3 to 10 cm involving the EIA not extending into the CFA Unilateral EIA occlusion not involving the origins of the internal iliac or CFA 		TASC B lesions <p>Multiple stenoses, each ≤ 5 cm in length, or total length ≤ 10 cm or single occlusion ≤ 3 cm in length, in the target tibial artery with occlusion or stenosis of similar or worse severity in the other tibial arteries.</p>	
TASC C lesions <ul style="list-style-type: none"> Bilateral CIA occlusions Bilateral EIA stenoses 3 to 10 cm long not extending into the CFA Unilateral EIA stenosis extending into the CFA Unilateral EIA occlusion involving the origins of the internal iliac and/or CFA Heavily calcified unilateral EIA occlusion with or without involvement of the origins of the internal iliac and/or CFA 		TASC C lesions <p>Multiple stenoses in the target tibial artery and/or single occlusion with total lesion length >10 cm with occlusion or stenosis of similar or worse severity in the other tibial arteries.</p>	
TASC D lesions <ul style="list-style-type: none"> Infrarenal aortoiliac occlusion Diffuse disease involving the aorta and both iliac arteries Diffuse multiple stenoses involving the unilateral CIA, EIA, and CFA Unilateral occlusions of both CIA and EIA Bilateral EIA occlusions Iliac stenoses in patients with AAA not amenable to endograft placement 		TASC D lesions <p>Multiple occlusions involving the target tibial artery with total lesion length >10 cm or dense lesion calcification or non-visualization of collaterals. The other tibial arteries occluded or dense calcification.</p>	

Treat the symptoms/patient, not the scans!!

- TASC A – D
- Increasing complexity of disease
- Does not necessarily relate to worsening symptoms
- A – best response to endovascular management
- D – Unable to undertake endovascular management/very poor response to endovascular management

Endovascular management - Angioplasty

- Balloon angioplasty
- Iliac and Infringuinal
- Best for short stenoses
- Longer occlusive disease less effective
- Luminal or subintimal
- Drug eluting



IV contrast – can highlight collateral systems

DES controversy – paclitaxel – studies suggested increased mortality / cancer risk – no one cause that was highlighted as reason patients were dying – increased use for CLTI patients.

Steps

- Ultrasound guided percutaneous access
- Wire access
- Catheters
- Angiogram
- Sheath
- Crossing the lesion – luminal?
- Balloon choice



Puncture above the femoral head so you have something to press against

Stenting

- Iliac disease
- Unsatisfactory result
- Subintimal
- Less is more?
- Uncovered/Covered
- Flexibility?
- Self expanding/balloon expanding



Can cause problems if there is further extension of disease – so don't use them if you don't need to
Covered only if concerned about rupture or bleeding

Open surgery




- Common femoral disease
- Femoral Endarterectomy

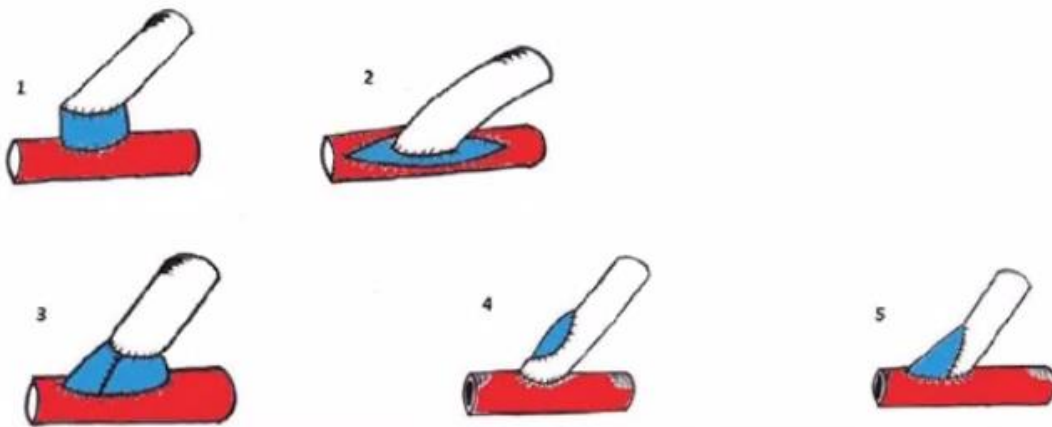
Femoropopliteal disease

- Femoro-popliteal bypass
- Above or below knee
- Vein (reversed/in-situ), synthetic or biological

- 1 = Miller cuff
2 = Linton patch
3 = St. Mary's boot
4 = Taylor patch - proximal anastomosis
5 = Taylor patch - distal anastomosis

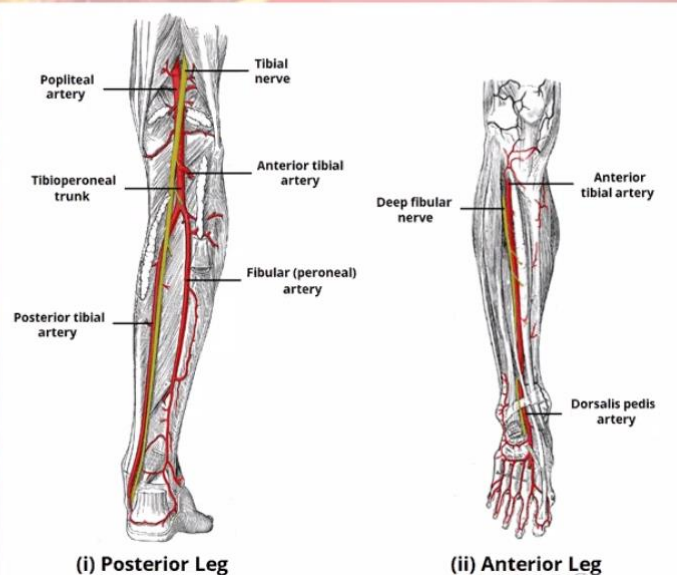
Color key:

-  Synthetic PTFE (politetrafluorethylene) graft
 Outflow artery (below knee popliteal artery)
 Vein cuff (segment of saphenous vein)



Tibial Disease

- Distal Bypass? – to crural vessels
- Ultradistal bypass? – to pedal vessels
- Poiseilles Law – Flow proportional to r^4 and inversely proportional to Length
- Conduit?



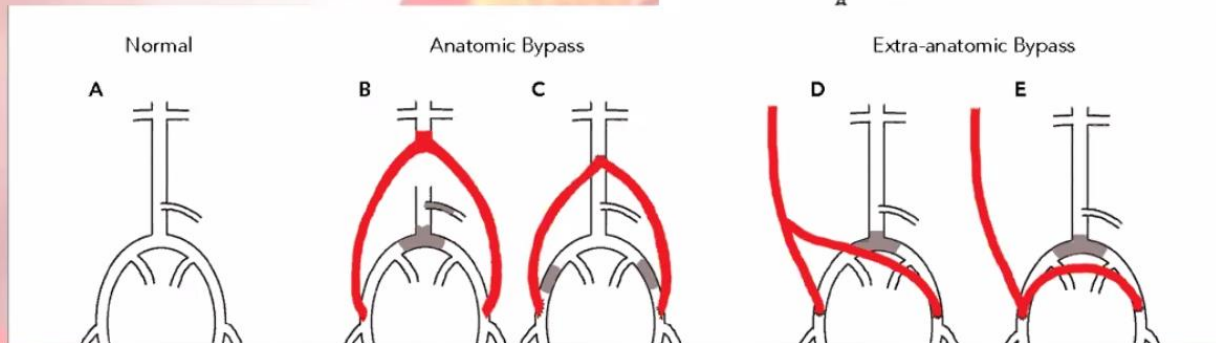
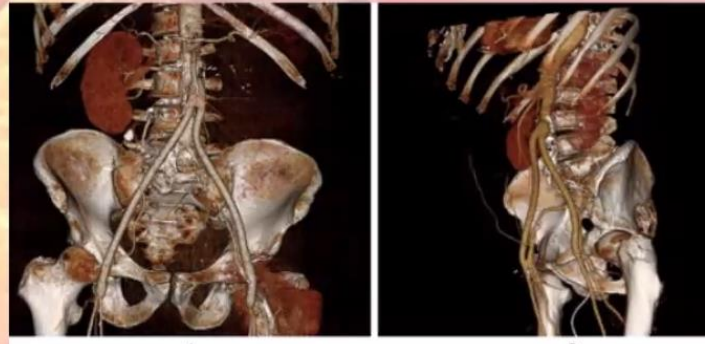
(i) Posterior Leg

(ii) Anterior Leg

Think of longevity of graft – short wide grafts flow well, long thin ones don't

Aortoiliac disease

- CERAB – Covered reconstruction of aortic bifurcation?
- Aorto-bifemoral bypass?
- Extra-anatomical bypass?
 - Ax-fem/Ax-bifem
 - Fem-fem crossover



Other options?

- Distal Venous Revascularisation?

Plumbing vein onto artery distally

Amputation

- Usually seen as negative outcome
- Can be new lease of life for patient
- Consideration of healing potential
- Level to amputate?
- Improvement of blood flow to achieve healing at lower level?



The longer the limb the better from a rehab POV