The Diabetic Foot

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The Size of the Problem

- Globally 4 million people develop foot ulceration every year
- 15%-25% of healthcare resources are taken up in the treatment of the diabetic foot
- Foot ulceration is the leading cause of diabetes related hospital admissions
- People with diabetes are 25 times more likely to lose a leg than people without diabetes
- 70% of amputations are a result of diabetic foot ulceration
- Proper care can reduce amputation rates by 49%-85%
- Every 30 seconds a leg is lost due to diabetes

OK, So it's a Problem

- It gets worse
  - 1 year mortality following foot ulceration 17%
  - 5 year mortality 50% (this is 3 times higher than breast Ca 17%, and is equivalent to the mortality from colon Ca)

Now I am Depressed


19/06/2008


Date:
Patient: 127805
20/03/2009


05/05/2009


05L4Q32S
30/(

Now I Feel Sick

Let’s Talk About a Few Things

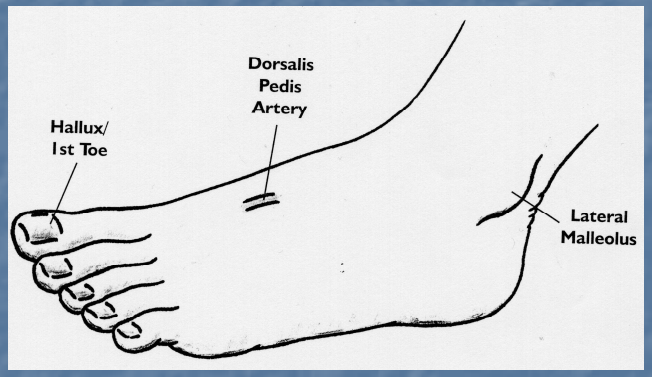
- Assessment
- Ulcers
  - Aetiology
  - Treatment
- Charcot's
  - Aetiology
  - Red flags
  - Treatment

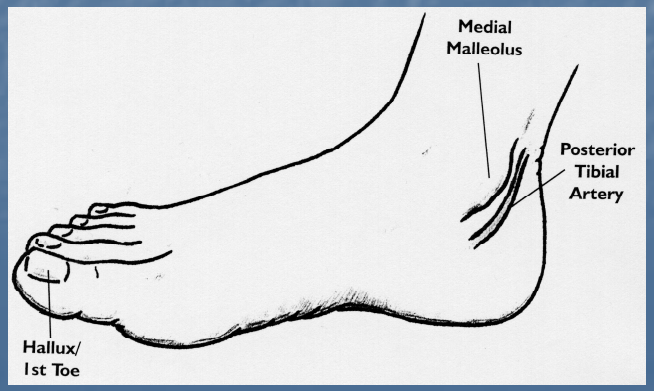
General Foot Assessment

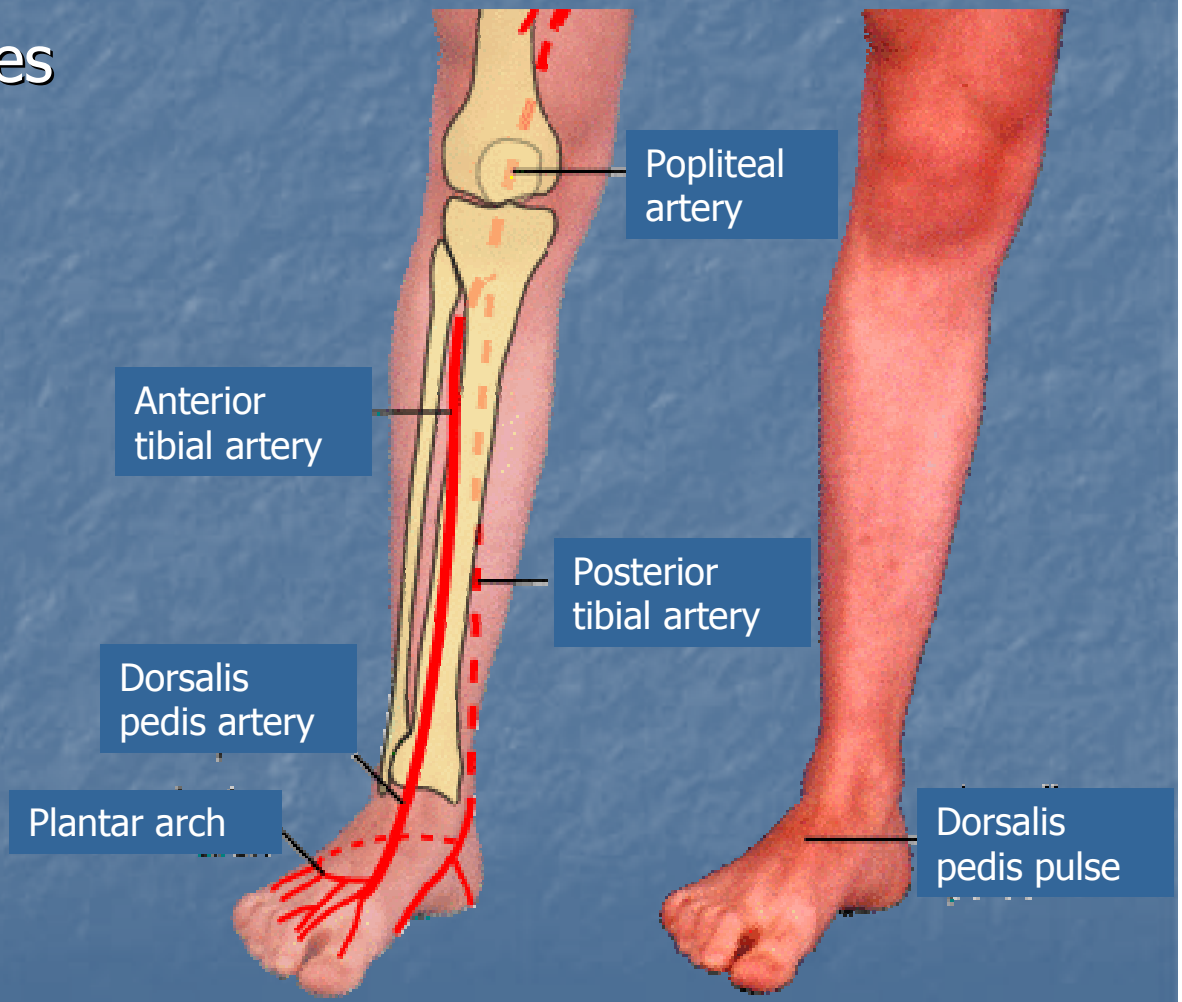
- Peripheral circulation
- Neuropathy

Peripheral Circulation

- The foot has 2 pulses
  - The posterior tibial
  - The dorsalis pedis





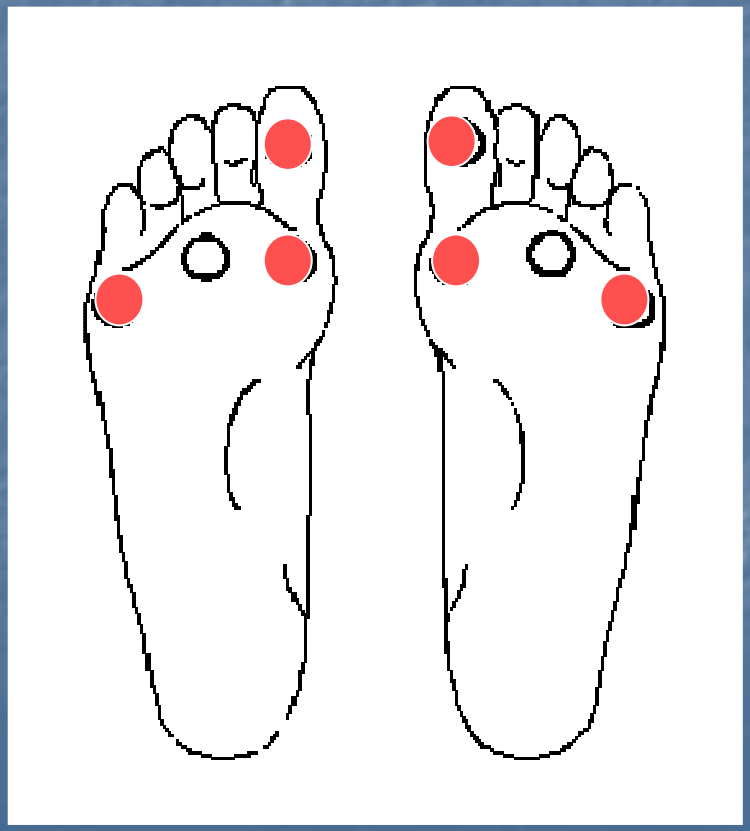


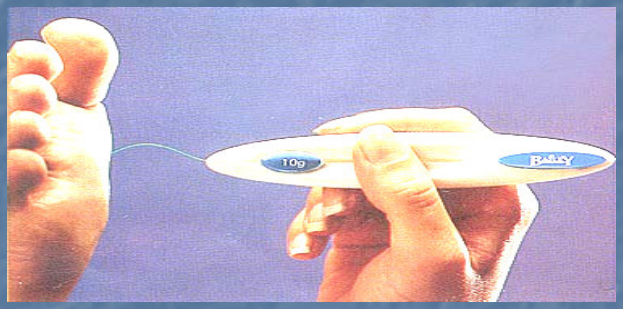
Neuropathy

- There is no internationally accepted way of defining neuropathy
  - So, do it one way, and then stick to it all the time
- Light touch
- Vibration sense
- ± Pin prick

Light Touch

- Use a Semmes-Weinstein 10g monofilament

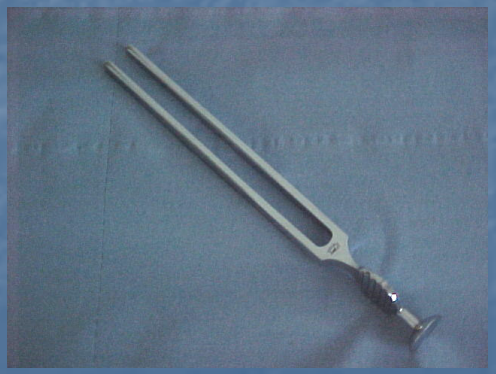




Vibration Sense

- Ideally using a neurothesiometer – but these cost about £1200 – they should be able to feel <25Hz

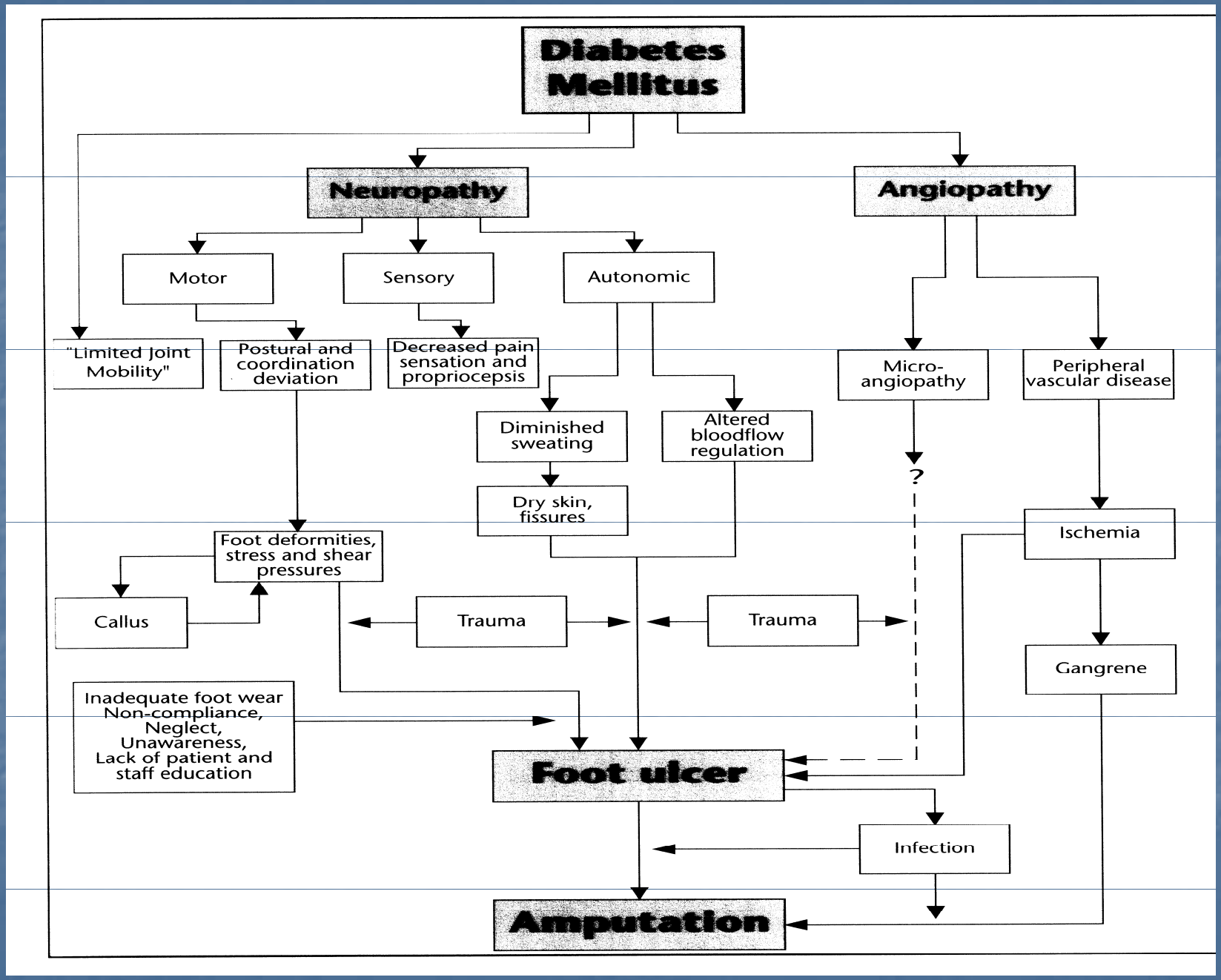
- Or, use a tuning fork – cheaper but less accurate – put it on the big toe and ask them when they feel the buzzing disappear (this assumes your fingers feel normally)



Ulcers

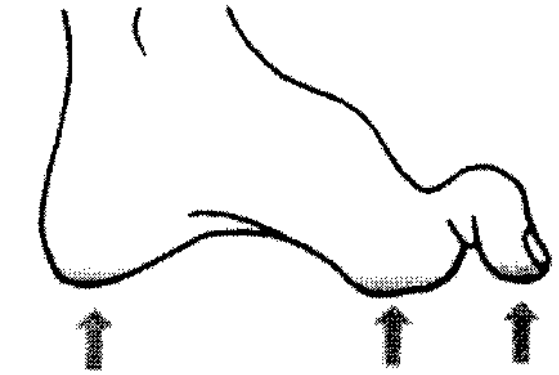
- Risk Factors
  - Previous amputation
  - Past foot ulcer history
  - Peripheral neuropathy
  - Foot deformity
  - Peripheral arterial disease
  - Visual impairment
  - Diabetic nephropathy (dialysis patients)
  - Poor glycaemic control
  - Smoking

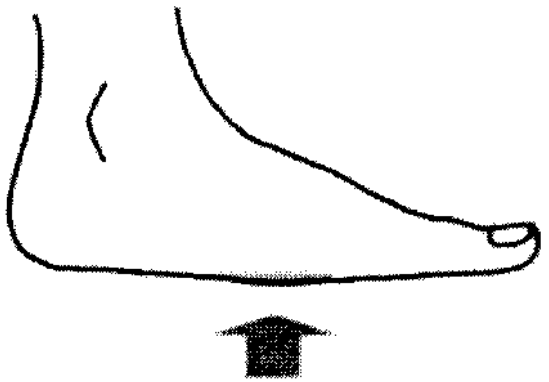
Thus the aetiology is a combination of pressure, peripheral vascular disease, and infection

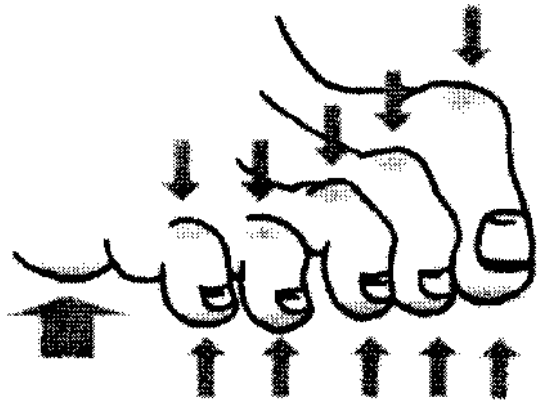

Diabetes Mellitus
Neuropathy
Angiopathy
Motor
Sensory
Autonomic
"Limited Joint Mobility"
Postural and coordination deviation
Decreased pain sensation and propriocepsis
Diminished sweating
Altered bloodflow regulation
Micro-angiopathy
Peripheral vascular disease
?
Dry skin, fissures
Ischemia
Foot deformities, stress and shear pressures
Callus
Trauma
Trauma
Gangrene
Inadequate foot wear
Non-compliance,
Neglect,
Unawareness,
Lack of patient and staff education
Foot ulcer
Infection
Amputation

Sensory Neuropathy

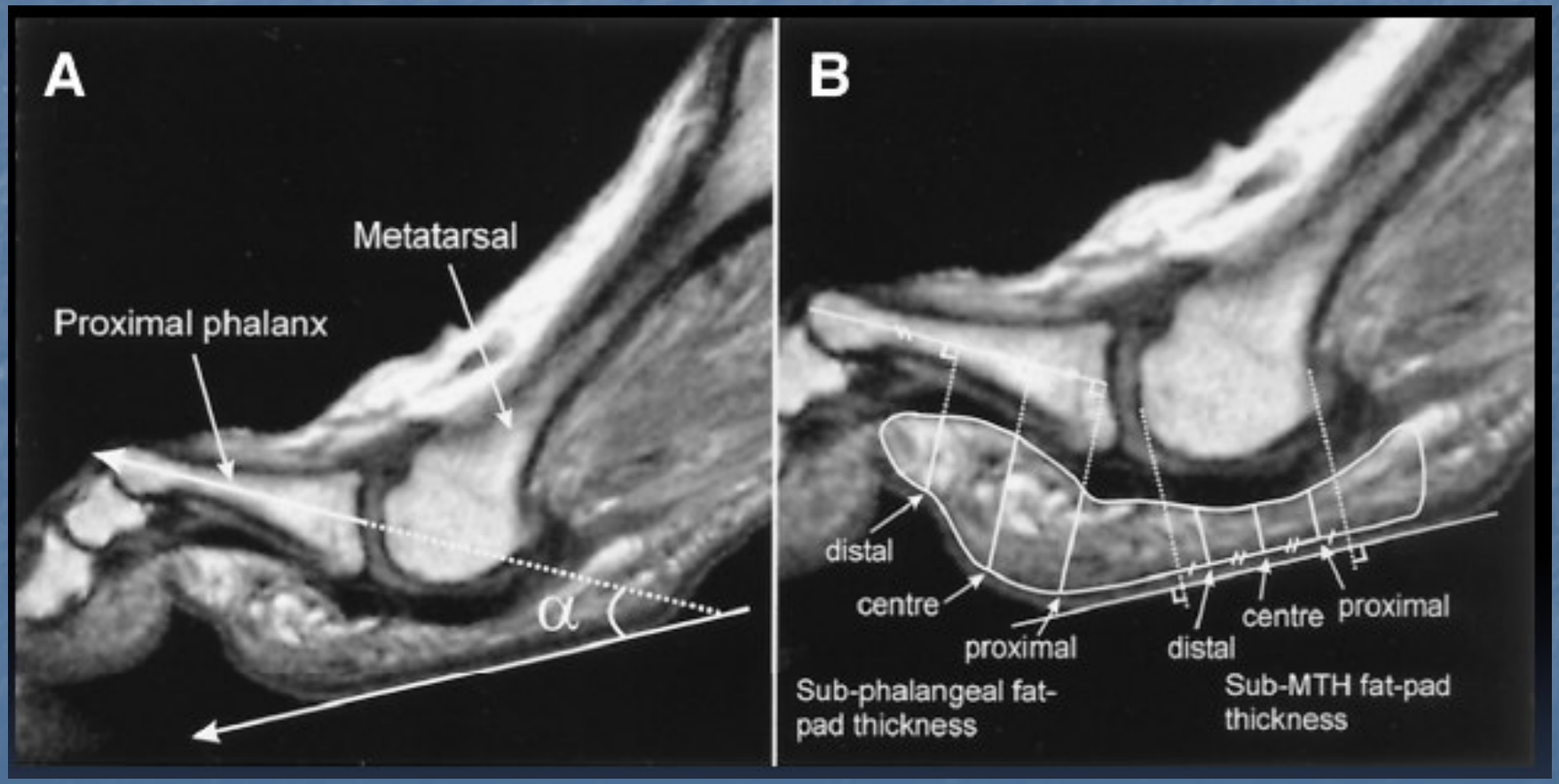
Motor Neuropathy







Changes Within the Foot



Changes Within the Foot

Foot Ulceration

Diabetes & Atherosclerosis

- Develop PAD at a younger age
- Affects men and women equally
- Associated with hyperlipidaemia
- Progression is more rapid
- Many parts of the artery develop disease
- Occurs in the distal arterial tree

Treatment for Foot Ulcers

- Follow some simple principles
  - Treat any infection that may be present with appropriate antibiotics
  - Debride any tissue that might be dead or getting in the way of healing (this is a podiatrists job)
  - Offload the wound as much as possible
  - Revascularise as necessary
- When in ANY DOUBT – refer to your specialist foot team

An Example of a Foot Formulary

Norfolk and Norwich University Hospitals NHS
NHS Foundation Trust

Quick Reference Guideline Table 2: Antibiotic Management of Diabetes Related Foot Infections In Adults

	FIRST CHOICE		PENICILLIN ALLERGY		
	PARTIAL OR FULL THICKNESS	*EXTENDING TO UNDERLYING SOFT TISSUE/ BONE*	*PARTIAL OR FULL THICKNESS*	*EXTENDING TO UNDERLYING SOFT TISSUE/ BONE*	**DURATION**
MILD#	Co-amoxiclav 625mg tds PO	Co-amoxiclav 625mg tds PO	Clarithromycin 500mgs bd PO	Clarithromycin 500mgs bd PO Metronidazole 400mgs tds PO	Review after 1-2 weeks. May require an additional 1-2 weeks of treatment. See guidance below re LFT monitoring if treatment continues beyond 2 weeks
MODERATE#	Co-amoxiclav 625mgs tds PO If co-amoxiclav has previously been used with no success then consider using Clindamycin 150mg-300mg qds PO instead	Co-amoxiclav 625mgs tds PO +/- Ciprofloxacin 500mgs bd PO If co-amoxiclav has previously been used with no success then consider using Clindamycin 150mg-300mg qds PO instead of co-amoxiclav See guidance note 2 & 5 re adding in ciprofloxacin	Clindamycin 150mg - 300mg qds PO	Clindamycin 150mg-300mg qds PO +/- Ciprofloxacin 500mgs bd PO (see guidance note 2 & 5 below re adding in ciprofloxacin)	2-4 weeks
SEVERE BORDERLINE ADMISSION (this regimen will be reviewed regularly as to whether admission is necessary)	Ceftriaxone 1-2g od IM* (see notes below re IM administration) Ciprofloxacin 500mgs bd PO Metronidazole 400mg tds PO If MRSA positive use teicoplanin in place of ceftriaxone.		Ceftriaxone 1-2g od IM* (see notes below re IM administration) Ciprofloxacin 500mgs bd PO Metronidazole 400mg tds PO See guidance note 1 below re penicillin allergy. In true penicillin allergy or if MRSA positive use Teicoplanin IM* 400mg od (see notes below re IM administration) Ciprofloxacin 500mg bd PO Metronidazole 400mg tds PO		2-4 weeks
SEVERE NEEDS ADMISSION	Tazocin 4.5g tds IV If polymicrobial infection suspected with MRSA then add in vancomcyin 1g bd IV to the above. (see guidance notes 3 below)		Clarithromycin 500mg bd IV Metronidazole 400mg tds IV Ceftazidime 1g tds IV (2g tds IV if very severe). Substitute with Ciprofloxacin 500mg bd PO in true penicillin allergy. (see guidance note 1) If polymicrobial infection suspected with MRSA then add in vancomcyin 1g bd IV to the above regimen (omitting clarithromycin). See guidance note 3.		2-4 weeks

*IM antibiotics should only be given where there are appropriate facilities available to treat anaphylaxis. Ceftriaxone 2g IM should be given as two separate 1g injections in different sites.

If patient is MRSA positive then prescribe according to sensitivities (combination of 2 of the following oral antibiotics, doxycycline, trimethoprim, rifampicin, fusidic acid (but do not use fusidic acid in combination with rifampicin). Discuss with a Medical Microbiologist on 4588 if sensitivities not available.

Co-amoxiclav may cause cholestatic jaundice if use is prolonged, especially in patients over 65 years. If treatment continues over 2 weeks liver function tests (LFTs) should be carried out. Cholestatic jaundice may occur up to 6 weeks after treatment is stopped.

Charcots

- Definition:
  - A relatively painless, progressive & destructive arthropathy in a single or multiple joints due to underlying neuropathy

- If you see someone with diabetes who had a hot red swollen foot then this needs an urgent referral to the specialist diabetic foot team

Charcots

- It is uncommon – occurring in <0.5% of people with diabetes
- It makes up 50% or more of my workload at the N&N
- Due to a combination of factors
  - Peripheral neuropathy
  - Selective sympathetic neuropathy
  - Disruption pre-capillary sphincters
  - High throughput foot
  - Disruption of bone surface regulation
  - Trauma
  - Renal failure

Charcots

- Diagnosis can be very difficult
- Hot red swollen foot
- Temperature difference of >2^{o}C between feet
- When in doubt – refer where they may do an MRI

Management

ACUTE

- Immobilisation in a TCC
- Pneumatic walkers
- CROW
- Rest
- Crutches

CHRONIC

- Footwear
- Orthosis
- Corrective Surgery
- Health Education
- Palliative podiatry

In Summary

- The number of people with diabetes is increasing
- More and more people will be looked after in primary care – i.e. by YOU
- More and more people will develop foot problems
- If in doubt – refer to the specialist foot team

- Ask them to stop smoking
- Make sure they are taking their medications as advised

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