Where do we start?
Format of Discussion

- Introduction
- Why Podiatry in Diabetes Health, what do the statistics show?
- Diabetes Foot Pathology
- Referral Pathway for Diabetes Foot screening and assessment
- Foot Assessment, Criteria for Priority
- Management (Primary, Secondary) The Dream Team
- Closing comments, questions?
Some interesting statistics

- In NZ there are 250,000 person living with diabetes (90% with type 2)
- Further 500,000 persons “pre-diabetes” (having HbA1c 41-49mmol)
- Increasing diagnosis per day 8.5% or 50 persons per day
- 243 Podiatrists in NZ. 34 working in Specialized Diabetes. (50 graduates per year from NZ Podiatry College, 23 leave NZ)
- Diabetes complications - lower limb amputation rates (BKA or partial)
  2007-2009 (age 50<) per 100000 total 700.7 male 473 female 227.7
  - maori male 387.4 female 123.7
  - non-maori male 85.6 female 25.3
- Average cost per amputation $2500-$5000, ulcer tx (3months) $10-20000
- Diabetic foot complications remain a major cause of health expenditure
- Lower limb amputation carries a high mortality rate within 5 years
- Enrolled nurses in NZ: WAY TOO FEW!
The Impact of Diabetes on the Foot

“Diabetes impacts on the foot through multiple mechanisms and pathways, but the two most important remain PERIPHERY SENSORY LOSS and RESTRICTED ARTERIAL BLOOD FLOW. The consequences of these abnormalities range from the asymptomatic, but high risk foot to the devastating consequences of lower limb amputation.”

Associate Professor Johnathan Shaw, 2014
The Diabetes foot----Pathology

- ANGIOPATHY -- micro vs macro
- NEUROPATHY -- neuralgia vs neuropathy
- PRESSURE -- signs vs skin reaction (colour change, callousities,)
- INFECTION -- localised and general
- ULCERATION -- venous vs arterial
- OSSEUS -- biomechanics, arthritis, RA, gout, osteomyelitis
- Charcot’s foot
- GANGRENE - dry/wet
- AMPUTATION
ANGIOPATHY

- Disease of the BLOOD VESSELS (Arteries, veins, capillaries)

**Macro Angiopathy** ---- atherosclerosis, decrease bloodflow
    --PVD------contributing to ulceration

**Micro Angiopathy** ---- smaller blood vessels—thickened, weaken leads to hemorrhage and protein leakage. Decrease bloodflow through stenosis (clot formation). This impairs flow of O2 to cells and biological tissues (Ischaemia)--- can lead to necrosis or gangrene.

**Other** ---- Retinopathy, common cause of blindness in elderly
    ----- Neuropathy, commonly caused by Diabetes
    ----- Nephropathy --- renal failure, often caused by DM --- most common factor in lower limb amputation
NEUROPATHY

- Damage or Disease affecting nerves, which may impair sensation, movement, gland or organ function.

- Diabetes with excessively high blood glucose levels over time can caused demyelination of nerve fiber sheath

**** Motor Neuropathy: impaired balance and coordination with muscle weakness

**** Sensory Neuropathy: numbness, decrease position sense, decrease sensitivity to hot/cold, sharp/blunt tingling, pain, allodynia (severe pain from normally non-painful stimulus such as light touch)

**** Autonomic Neuropathy: decrease bladder control, abnormal BP or heart rate, and decrease ability to sweat normally
PRESSURE-

- frictional --- blisters, callouses
- direct (internal/external) --- corns, haematoma
- shear --- fissures (heels)
- biomechanics
- pressure sores
- ulceration
Localised vs Generalised Foot Infections

Localised Foot Infection

- Redness, heat and swelling confined to an area.
Localised vs Generalised Foot Infection cont.

Generalised Foot Infection

- Whole foot is red and swollen.
ULCERATION - THE PROCESS OR FACT OF BEING ERODED AWAY

- COMMON FOOT ULCER SITES
OSSEOUS

- ABNORMAL BIOMECHANICS

- Arthritis, RA, Gout

- Osteomyelitis
Charcot’s foot

healthy foot

charcot foot

X-ray of foot
Gangrene
AMPUTATION

“THE AMBULANCE AT THE BOTTOM OF THE CLIFF”!!
## Referral Pathway For Diabetes Foot Screening and Assessment

<table>
<thead>
<tr>
<th>low risk</th>
<th>moderate risk</th>
<th>high risk</th>
<th>active</th>
</tr>
</thead>
<tbody>
<tr>
<td>- protective sensation</td>
<td>- one risk factor present</td>
<td>- previous amputation</td>
<td>- active ulcer</td>
</tr>
<tr>
<td>intact (10g pressure)</td>
<td>- one risk factor present</td>
<td>- previous ulcer</td>
<td>- spreading infection</td>
</tr>
<tr>
<td>- one or more pulse</td>
<td>- loss of protective sensate</td>
<td>- previous ulcer</td>
<td>- critical limb ischaemia</td>
</tr>
<tr>
<td>present in each foot</td>
<td>- absent or diminished pulses</td>
<td>- loss of protective sensate</td>
<td>- Gangrene</td>
</tr>
<tr>
<td></td>
<td>- foot deformity with callous</td>
<td>- absent/diminished pulses</td>
<td>- signs/present Charcot</td>
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<tr>
<td></td>
<td>- pre-ulcerative lesion</td>
<td>- PAD</td>
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<td></td>
<td></td>
<td>- Charcot Deformity</td>
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<td></td>
<td></td>
<td>- foot deformity with callous</td>
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<td></td>
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<td>- end stage renal failure</td>
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<tr>
<td></td>
<td></td>
<td>- cultural (Maori/Indian/PI)</td>
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**Risk consideration must include the general assessment including:**
- medications
- diabetes status
- general health
- activity/mobility
- diet
- social support
FOOT ASSESSMENT-initial

ALWAYS COMPARE FEET

Medical History, medications, Activity/social/cultural, bloods/BGLs, footwear/hosery, 

Actual

**COMPREHENSIVE**
- Colour - demarcation
  - varicositys
  - localized/general
- Hair growth/distribution
- Nails - all conditions
- Foot shape - biomechanics, joint ROM
- Temperature - dermatemp
- Skin - Integrity
  - pathology
  - Lesions

**WITHOUT TOOLS**
- Colour - demarcation
  - varicositys
  - localized/general
- Hair growth/distribution
- Nails - fungal? Ingrown?
- arch shape, toe deformitys
- Back of hand cold/warm
- Integrity
- Pathology
- Lesions

**PATIENT**
- Colour - demarcation
  - red/white
- Temperature - hot/cold
- Lesions
Foot Assessment (continued)

comprehensive

Vascular - manual pulses DP, PT
  - Doppler: DP, PT, peroneal hallux lateral
  - Oximeter
  - ABPI
  - toe pressure

Neurovascular - monofilaments
  - sharp/blunt
  - hot/cold Baileys
  - 2 point discriminator
  - Biothesiometer/tuning fork

without tools

- manual DP, PT
- 10g monofilament
- rubber ended pencil
- 5 point adex finger touch
Vascular assessment tools
Neurovascular assessment tools
Diabetes Foot Health
the team approach “THE DREAM TEAM”
PRIMARY AND SECONDARY

**Primary** team leader---the patient

- Podiatrist
- Nurses: E.N, R.N, N.Practitioner
- Endocrinologist/G.P
- Dietitian
- Social worker/Kaimihi/Whanau
- Orthotics

referral to: Vascular, Orthopedics, smoking cessation

Example: TeRunanga O Raukawa “the importance of bi-culturalism”
“the dream team”  Mach 2

- **Secondary**
  - Team leader: the patient
  - Podiatrist
  - Nursing: E.N/Wound Nurse, D.N, Practitioner
  - Vascular/Orthopedics
  - Radiography
  - Endocrinology/Nephrology
  - Orthotics

- Case Study:
He aha te mea nui O te oa  
He tangata, he tangata, he tangata
What is the most important thing in the world, it is people, it is people, it is people