The Multidisciplinary Foot Clinic: Rationale & Experience

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The Diabetic Foot

- A collection of foot problems which are not unique to, but occur more commonly in diabetic patients
Aetiology of the Diabetic Foot

- Neuropathy (>90% of cases)
- Biomechanical abnormalities
- Ischaemia (20-30% of cases)
- Reduced response to infection
Rationale of a Multi-Disciplinary Foot Service

• No single clinician has all necessary skills to manage diabetic foot pathology

• MDF can reduce major amputations by up to 72%
Incidence of Diabetes

• Expected incidence (worldwide) of diabetes in:
  – 2000: 177 million
  – 2030: 366 million
Diabetes in Australia

- 898,800 Australians diagnosed with diabetes in 2007/8
  - 87,100 Type I
  - 787,500 Type II

- 96% of individuals with diabetes >35 years old
- 43% of individuals with diabetes >65 years old
‘Proportion of people diagnosed by age’
Projected prevalence of diabetes in South Australia

Source: Health Omnibus Surveys, Ages 15+
### Diabetes in New Zealand 1996-2011

**Burden of (diagnosed) diabetes, 1996**

<table>
<thead>
<tr>
<th>Lifetime risk of diabetes (%)</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Māori</td>
<td>Pacific</td>
</tr>
<tr>
<td>26</td>
<td>23</td>
<td>10</td>
</tr>
</tbody>
</table>
Diabetes in New Zealand 1996-2011

- Relative contribution to forecast increase in number of (diagnosed) diabetics, 1996-2001
Diabetes in Malaysia

- 1986- 6.3% adults over 35 years
- 1996- 8.3% adults over 35 years
- 2006- 11.6% adults over 18 years
- Projected 2025- 13.5% of adult population
- Currently 19.9% of Indian adults affected
Foot complications of Diabetes

- 25% lifetime risk of developing foot ulcer
- 60% of all non-traumatic lower limb amputations related to complications of diabetes
- Amputation associated with 50% 5 year mortality
Objectives of a Multi-Disciplinary Foot Service

- Provide best practice care in complex diabetic foot pathology
- Develop protocols for other practitioners
- Education to — podiatry students/podiatrists — nurses — medical staff/students
- Outreach consulting
- Outreach education/video conferencing
Initial Clinical Assessment

• All patients
  – Vascular Surgeon
  – Podiatrist
  – Wound Nurse

• Selective patients
  – Endocrinology
  – Infectious Diseases
  – Orthotics
  – Orthopaedics
Assessment on presentation at MDF Clinic

- Detailed foot assessment
  - Neuropathy (monofilament test)
  - University of Texas Wound Classification
- X-Ray foot
- Bloods
  - FBC, electrolytes, creatinine
  - HbA1c
  - ESR, CRP
- Photography
- Dopplers and toe pressures
The University of Texas (UT) Wound Classification System

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pre- or post ulcerative lesion</td>
<td>A–D</td>
</tr>
<tr>
<td>2</td>
<td>Superficial</td>
<td>A–D</td>
</tr>
<tr>
<td>3</td>
<td>Penetrated to tendon or capsule</td>
<td>A–D</td>
</tr>
<tr>
<td>4</td>
<td>Penetrates to bone</td>
<td>A–D</td>
</tr>
</tbody>
</table>

Stages:  
A - no infection or ischemia;  
B - infection;  
C - ischemia;  
D - infection and ischemia
Prediction of Wound Healing in Foot / Ankle Ulcers

<table>
<thead>
<tr>
<th>Pulses present</th>
<th>Ankle: Brachial Index</th>
<th>Healing likely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pulses absent</td>
<td>ABI &lt;0.6</td>
<td>Healing unlikely</td>
</tr>
<tr>
<td></td>
<td>Dopplers incompressible or &gt;0.6 + toe pressure &lt;40mmHg</td>
<td>Healing unlikely</td>
</tr>
<tr>
<td></td>
<td>ABI &gt;0.6 + toe pressure &gt;40mmHg</td>
<td>Healing likely</td>
</tr>
</tbody>
</table>

NB: take into account age, renal function, nature of wound
Offloading

- Elevated (plantar) pressures in neuropathic foot
  - Callus
  - Ulceration
Pressure Assessment

• Bare foot (standing and walking)
• Inside footwear / orthoses
Peak plantar pressure measurement
Role of MRI (with Gadolinium)

- Diagnosis of Charcot
- Mid-foot / calcaneal osteomyelitis
- Presence of pus in foot
- Gout / alternative diagnoses
Challenges to management of complex diabetic feet

• Difficulty accessing elective foot surgery
• Late presentation of cases
• Education of patient, GPs, surgeons and podiatrists
• Resource allocation
  – eg, offloading assessment, funding of adequate orthotics/orthotic staff
• Frustration of clinicians
Current Multi-Disciplinary Team

- Vascular Surgeon
- Endocrinologist
- Podiatrist
- Orthotist
- Radiologist
- Wound Care Nurse
- Orthopaedic Surgeon
- Infectious Diseases Physician
# American Diabetes Associated Risk Classification for the Diabetic Foot

<table>
<thead>
<tr>
<th>Risk Category</th>
<th>Definition</th>
<th>Treatment Recommendations</th>
<th>Suggested Follow-Up</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>No LOPS, no PAD, no deformity</td>
<td>Patient education including advice on appropriate footwear</td>
<td>Annually (by podiatrist)</td>
</tr>
<tr>
<td>1</td>
<td>LOPS ± deformity</td>
<td>Consider prescriptive or accommodative footwear</td>
<td>Every 3-6 months (by podiatrist +/- specialist)</td>
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<tr>
<td></td>
<td></td>
<td>Consider prophylactic surgery if deformity cannot be safely accommodated in shoes</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Continue patient education</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>PAD ± LOPS</td>
<td>Consider prescriptive or accommodative footwear</td>
<td>Every 2-3 months (by podiatrist +/- vascular surgeon)</td>
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<tr>
<td></td>
<td></td>
<td>Consider vascular consultation for combined follow-up</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>History of ulcer or amputation</td>
<td>Same as category 1</td>
<td>Every 1-2 months (by podiatrist)</td>
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<tr>
<td></td>
<td></td>
<td>Consider vascular consultation for combined follow-up if PAD present</td>
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