Diabetic foot

Diabetic patients (world)
171 million in 2000
366 million in 2030

Year 2546 (Thailand)
94.6% diabetic type 2
5.9% diabetic ulcer
1.5% - 1.6% amputation

Diabetic foot ulcer

Assessing foot problem

- History
- Physical examination
  Inspection
  - Foot deformity
  - Foot wear

Foot deformity
**Protective sensation**

- Pressure perception
  - Monofilament test
- Vibration perception
  - Turning fork 128 Hz
  - Biothesiometry

**Pressure perception**

- Semmes-Weinstein monofilament size 5.07 (10g)

**Monofilament test**

**Vibration test**

**Biothesiometry**

**High pressure point**

- Plantar pressure
  - Podoscope
  - Carbon fiber imprint
  - Foam mark
  - Platform measurement
Podoscope

Carbon paper imprint

Foam mark

A measurement platform

Neuropathic ulcer

Ischemic ulcer
Ulcer with infection

Off-loading

- Wheelchair
- Gait aids
- Total cast contact
- Insole
- Shoe modification

Wheelchair

Gait aids

Total cast contact (TCC)

- Gold standard off-loading method
- Reduce vertical pressure and horizontal shear while maintaining ambulation
- Reduce 75-85% of peak plantar pressure compared to street shoes
- Average healing time 36-43 days
- Most effective method for healing neuropathic ulcer

TCC
TCC

Indications

- 1. Acute or subacute neuropathic ulcer
- 2. M-W wound gr 1 or 2 plantar ulcer

Contraindications

- Active deep infection
- Gangrene
- M-W wound gr 3-5

Meggit-Wager Classification

Gr 0: no ulcer
Gr 1: superficial ulcer
Gr 2: Deep ulcer through subcutis
Gr 3: Deep ulcer with osteomyelitis
Gr 4: Localized gangrene
Gr 5: Extensive gangrene

Contraindications

Relative contraindications

- Fragile skin
- Excessive foot and leg swelling
- Unsafe in mobility with cast
- Dopper ABI < 0.4
- Unwilling to have cast

Advantages

- Maintain ambulation
- Reduce excessive plantar pressure
- Protect foot from further trauma

Disadvantages

- Impair mobility
- Joint stiffness, muscle atrophy, bone loss
- Unable to inspect wound
**Warning signs**

- Excessive swelling (too tight)
- Excessive mobility (too loose)
- Deep crack or soft spot in cast
- Drainage pus or blood visible on outside of cast
- Foul smelling odor of cast
- Sudden tender in the groin (inguinal lymph node)
- Pain or discomfort
- Fever

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**Removable Cast Walker**

- Good off-loading for ulcer
- Allow wound to be inspected and treated
- Pressure reduction similar to TCC, but lower healing rate: 65% healing rate, 50 days for RCW; 90% healing rate, 34 days for TCC
- Often remove the cast when at home (wore 20% of time)

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**Custom-mold shoe**

- Soft material to spread out pressure
- Reduce pressure from total contact
- Reduce pressure by increase pressure on adjacent area
Shoe modification

**Half-shoe**
- Wedged forefoot
- Large heel wedge
- Dorsiflexion 10-15 degree

- Inexpensive
- Not tolerated well
- Required gait aids

Shoe modification

**Rocker sole**
- Transfer motion
- Relief pressure under metatarsal heads or toes

Felted Pads
### Risk and Management

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<th>Category</th>
<th>Protective sensation</th>
<th>No history of ulcer</th>
<th>No foot deformity</th>
<th>Foot clinic</th>
<th>Education for proper shoes</th>
<th>Add soft insole</th>
<th>Custom molded shoes</th>
<th>Prescription shoes</th>
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</tbody>
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### Summary

- If you have diabetes, please remove your shoes and socks before the doctor comes in.

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**Thank you for your attention**