



Diabetic Foot Care in Primary care



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diabetic foot care

- Ulcer cleansing is best done with anti-septic solutions
 1. Yes
 2. No

Answer

- Povidone iodine, chlorhexidine, H₂O₂ are toxic to granulating tissue
- Sterile saline is better



diabetic foot care

- Positive Culture From ulcer swab requires promptly antimicrobial treatment ?
 1. Yes
 2. No

Answer:

- Superficial colonisation is very common
- Deep culture after superficial slough scrubbed off
 - Superficial debridement of eschar or dead tissue, by scalpel or scissor, wash with sterile saline
 - Then swab for culture
- Signs of infection



diabetic foot care

- Patient asks: I should buy shoes in the morning or evening ?

1. Morning
2. Evening

Answer:

- Evening, or after ambulation, when the feet are more swollen



diabetic foot care

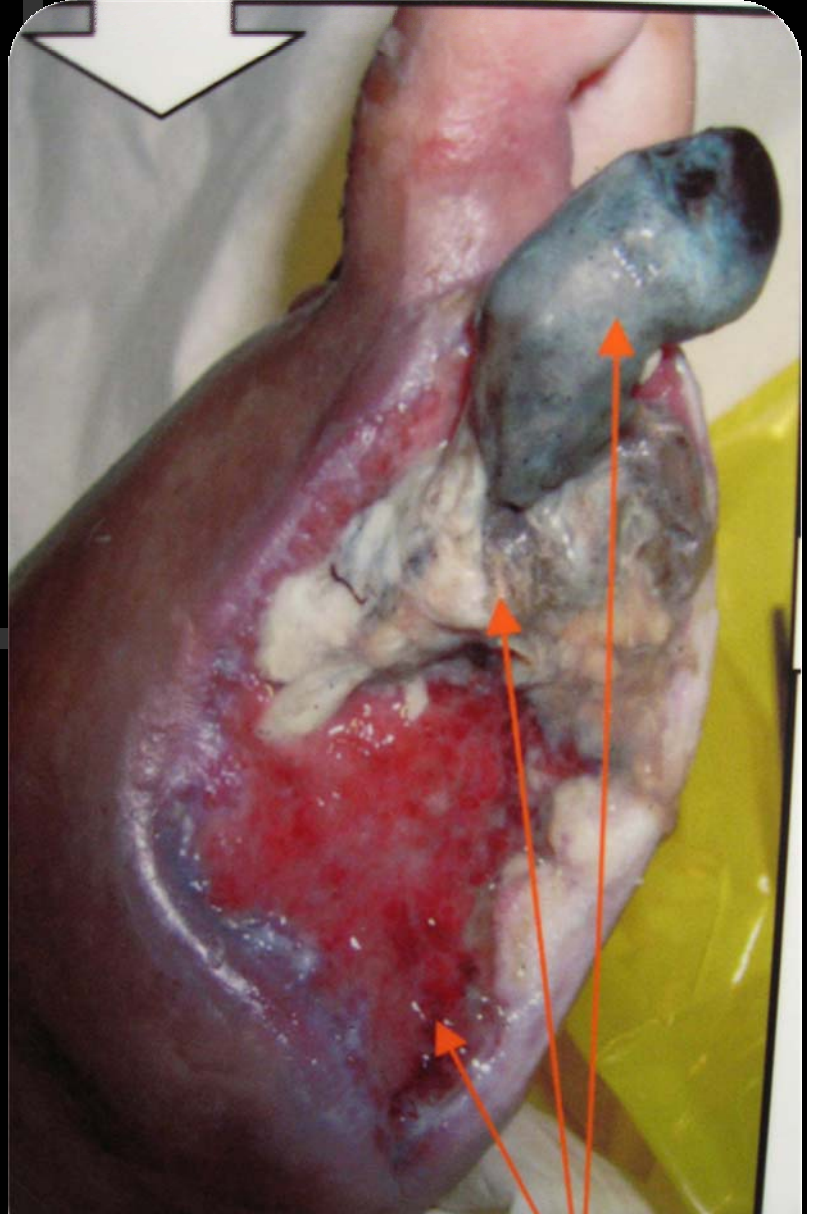
- Patient asks:
 - The diabetic sandals are expensive and buying more can get bigger bargain. How many pairs should I buy?

1. 4 pairs
2. 2 pairs

Answer

1. Feet change shape with time, buying too many may lead to un-fitting shoes
2. Yet 2 pairs of shoes for alternate days reduce deformity by allowing elastic recoil of plastics







Diabetic Neuropathy

- Automatic neuropathy
- Focal Neuropathy
- Peripheral neuropathy
 - 30% prevalence amongst all diabetes
 - 4% new case incidence
 - Primary factor in ulceration



Foot at risk

- Vibration perception threshold (VPT)
 - Reliable predictive parameter
 - Foot/toe ulcer
 - Amputation
- Ankle hypo-reflexia
- Retinopathy
- Male sex
- Tall stature
- Caucasian
- Glycaemic control
- Michigan neuropathy screening instrument



Foot at risk

- Predictive
 - Monofilament test: demonstration of sensory loss
 - monofilament, 5.07 semmes weinstein (the 10g)
 - Vibration perception threshold: biothesiometer
 - Thermal sensation
 - ABI
 - Deformity
- self-care education
- routine palliative foot care
- provision of protective footwear



Loss of protective sensation

- LOPS
- 128 Hz Tuning Fork test
- 10g, 5.07 semmes weinstein monofilament nylon

Biothesiometer





Vibration Perception Threshold


- VPT score = $10 + \{(\log V_o - \log V_m) / SD\}$
 - Score > 12 is abnormal
 - NOT user friendly
 - Research tool mainly
- Coppini DV (2000) Diabetic medicine 17. 487-91





Vibrational sense

- 128 Hz tuning fork
 - Trial of sensation
 - Vibrating fork at upper arm bony prominence
 - Non-vibrating fork at the big toe
 - Dorsum of un-supported IPJ of Big toe
 - Eyes closed
 - Signal when the vibration stops
 - Examiner should be able to feel vibration 5 seconds longer than patient
 - Abnormal the difference >10 sec
 - Vibration sense can be completely absent



Michigan Neuropathy Screening Instrument

- Foot appearance
- Ulceration
- Ankle reflex
- Vibration perception
- Monofilament test

MICHIGAN NEUROPATHY SCREENING INSTRUMENT

B. Physical Assessment (To be completed by health professional)

1. Appearance of Feet

- Right**
- a. Normal 0 Yes 1 No
- b. If no, check all that apply:

- Deformities
- Dry skin, callus
- Infection
- Fissure
- Other
- specify: _____

- Left**
- Normal 0 Yes 1 No
- If no, check all that apply:

- Deformities
- Dry skin, callus
- Infection
- Fissure
- Other
- specify: _____

- | | Right | | | Left | | |
|--------------------------------------|----------------------------|--------------------------------------|----------------------------|----------------------------|------------------------------|----------------------------|
| | Absent | | Present | Absent | | Present |
| | <input type="checkbox"/> 0 | | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | | <input type="checkbox"/> 1 |
| 2. Ulceration | | | | | | |
| | Present | Present/ Reinforcement | Absent | Present | Present/ Reinforcement | Absent |
| 3. Ankle Reflexes | <input type="checkbox"/> 0 | <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1 |
| | Present | Decreased | Absent | Present | Decreased | Absent |
| 4. Vibration perception at great toe | <input type="checkbox"/> 0 | <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1 |
| | Normal | Reduced | Absent | Normal | Reduced | Absent |
| 5. Monofilament | <input type="checkbox"/> 0 | <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1 | <input type="checkbox"/> 0 | <input type="checkbox"/> 0.5 | <input type="checkbox"/> 1 |

Signature: _____

Total Score _____ /10 Points

Patient Version

MICHIGAN NEUROPATHY SCREENING INSTRUMENT

A. History (To be completed by the person with diabetes)

Please take a few minutes to answer the following questions about the feeling in your legs and feet. Check yes or no based on how you usually feel.

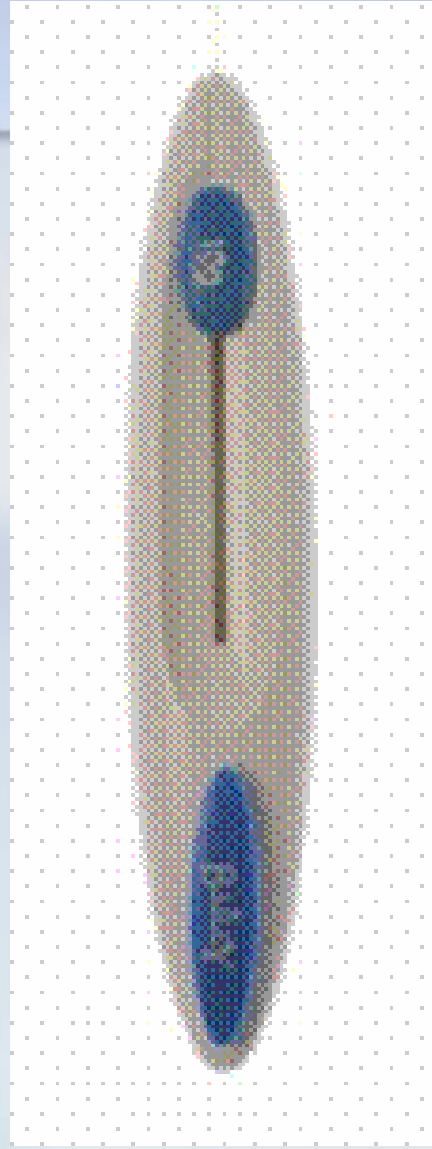
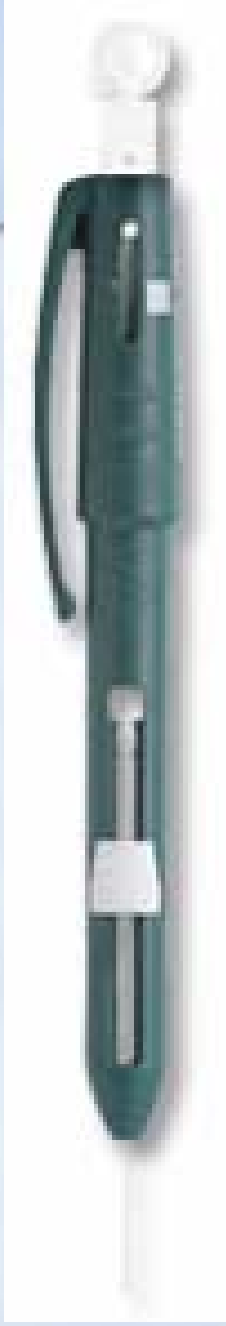
Thank you.

- | | | |
|---|-----|----|
| 1. Are you legs and/or feet numb? | Yes | No |
| 2. Do you ever have any burning pain in your legs and/or feet? | Yes | No |
| 3. Are your feet too sensitive to touch? | Yes | No |
| 4. Do you get muscle cramps in your legs and/or feet? | Yes | No |
| 5. Do you ever have any prickling feelings in your legs or feet? | Yes | No |
| 6. Does it hurt when the bed covers touch your skin? | Yes | No |
| 7. When you get into the tub or shower, are you able to tell the hot water from the cold water? | Yes | No |
| 8. Have you ever had an open sore on your foot? | Yes | No |
| 9. Has your doctor ever told you that you have diabetic neuropathy? | Yes | No |
| 10. Do you feel weak all over most of the time? | Yes | No |
| 11. Are your symptoms worse at night? | Yes | No |
| 12. Do your legs hurt when you walk? | Yes | No |
| 13. Are you able to sense your feet when you walk? | Yes | No |
| 14. Is the skin on your feet so dry that it cracks open? | Yes | No |
| 15. Have you ever had an amputation? | Yes | No |



Monofilament test

- 5.07 nylon (10 g) semmes weinstein monofilament
 - Buckle at a pressure of 10g
 - Owen Mumford's Neuropen
 - Bailey's 10g monofilament
- quiet and relaxed
- Warm
- No peeping





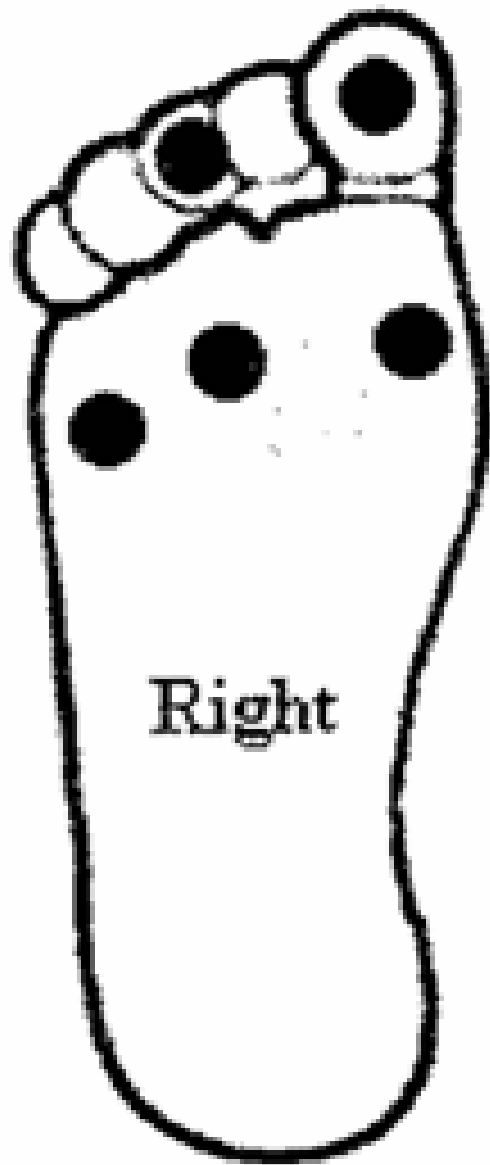
Monofilament test

- Apply pressure at 3 to 5 sites
- 2 times with touch, one "sham"
- Contact time ~ 2 sec
- Do not slide or do repetitive contacts

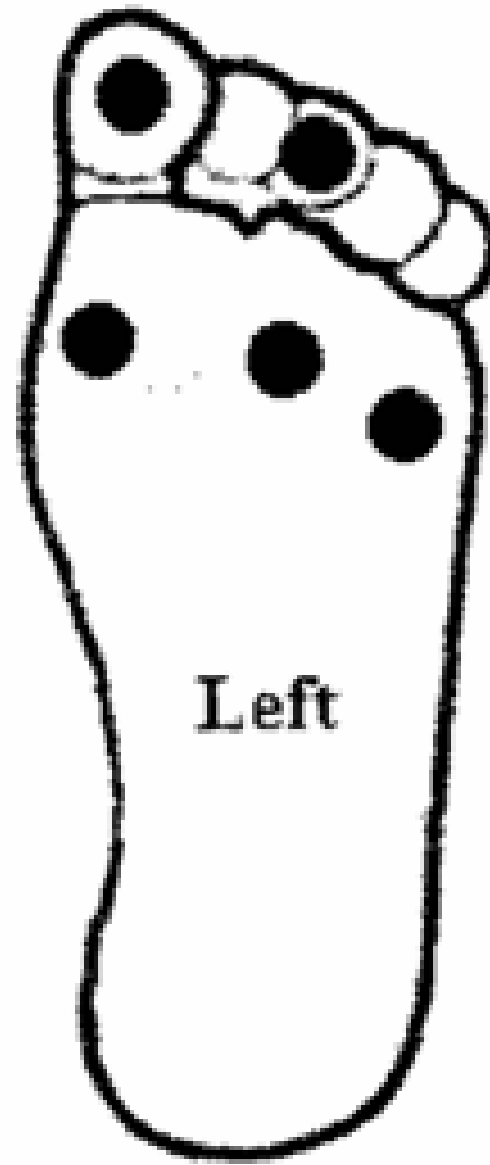
- Ask where if patient replies "yes"
- >2 incorrect answers at any site
 - Loss of protective sensation at that site



Fig 6. Sites to be tested with the monofilaments



Right



Left



Monofilament test

- Monofilament textural changes with use
 - Use for <10 patient per day
 - Allow 24 hr for visco-elastic recovery
 - Prepare more than 1 in each clinic
 - Change every 6 months after regular use
 - Change every 12 months after less frequent use



- **Cost: Owen Neuropen: HK\$150**
 - The filament replacement: HK\$ 0.5 each

- **Bailey's Monofilament**

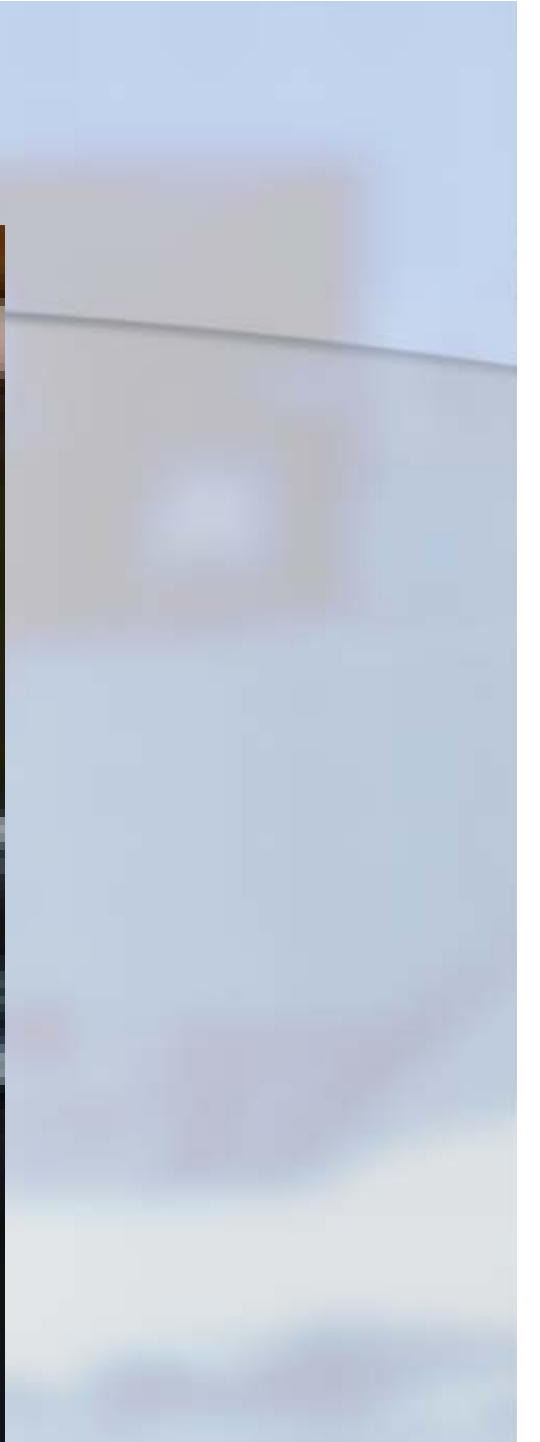
- Available at Health Castle
 - Mr. Chan 9367-7769
 - \$720
- On-line
 - £ 15

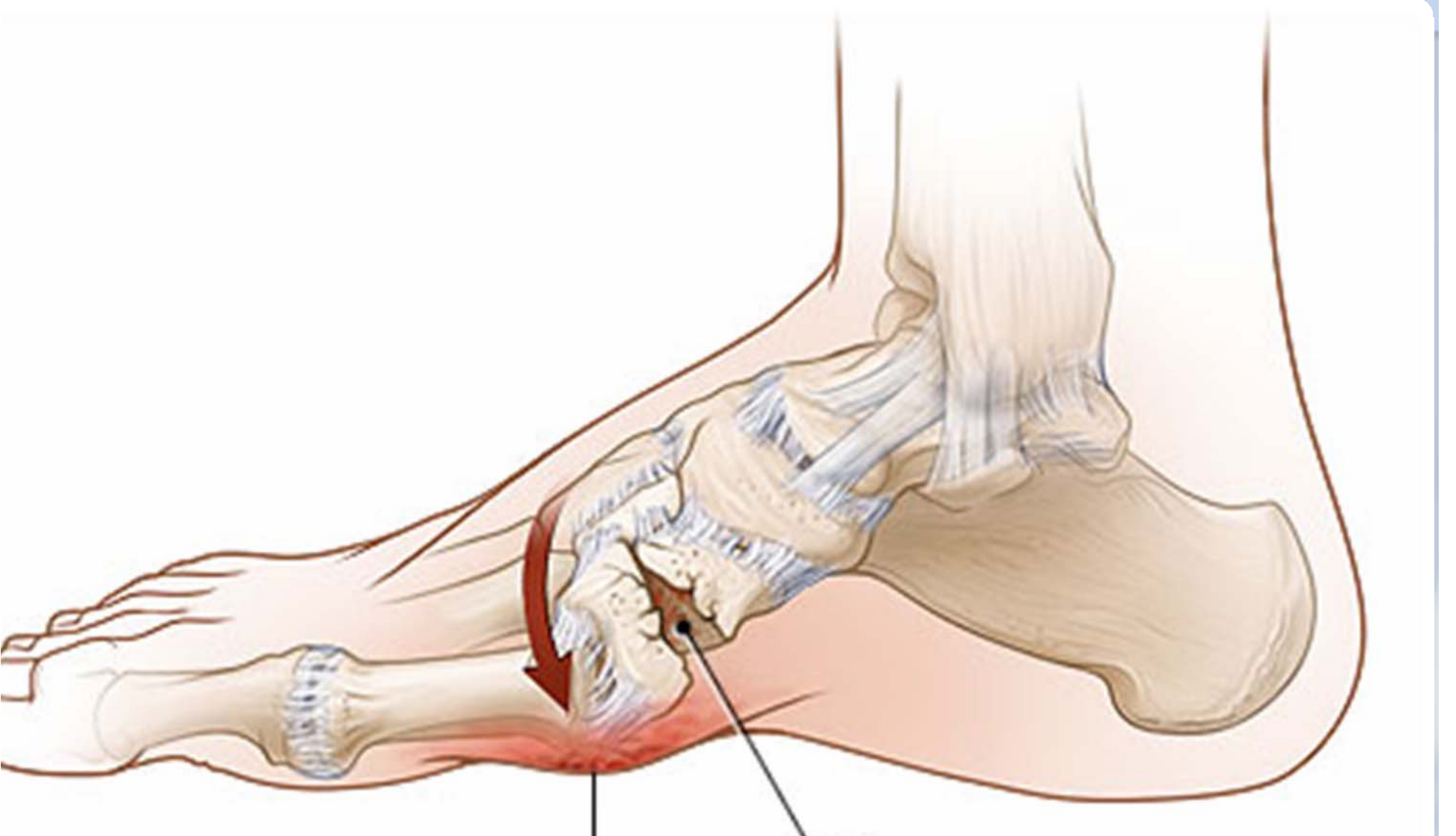


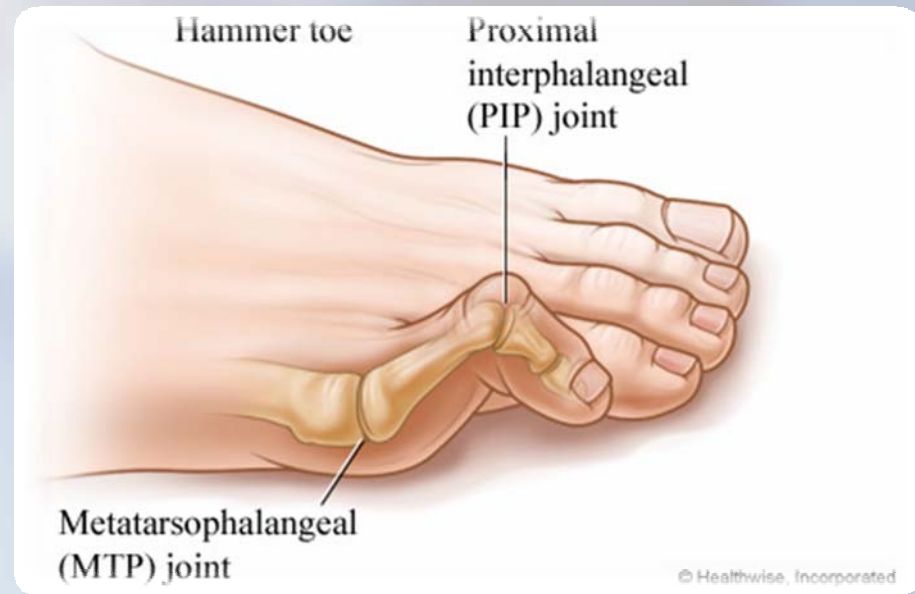
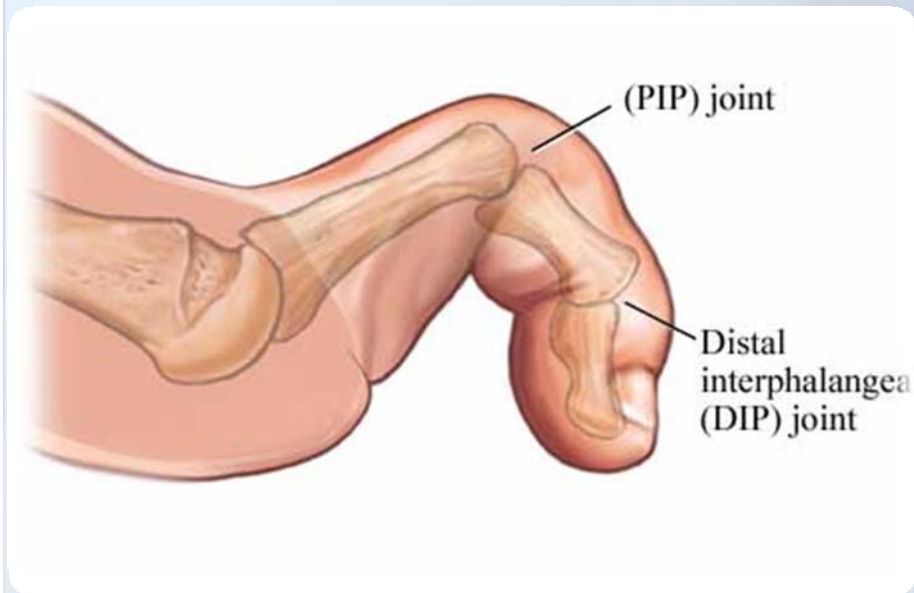
Foot Derformity

- Adult Acquired Flat feet
- Charcot Arthropathy
- Hallux valgus
- Hammar/claw toe









Hammer toe





Non Ulcer Pathology

- Calluses
- Blisters
- Fissure
- peeling skin
- Web Maceration
- Tinea
- Nail

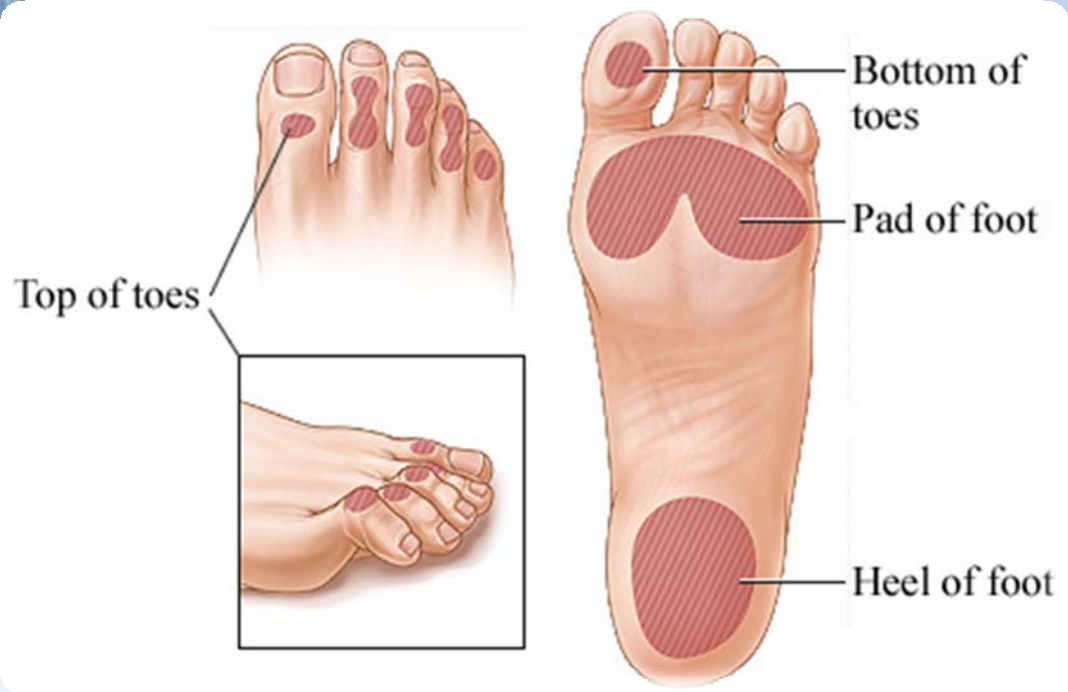






Foot examination

- Deformity
- Corn callosity
- Ulcer
- Cracks
- Tinea
- Moisture
- Web space, maceration
- Nail care
- Sign of peripherheral vascular disease
 - Hair, capillary return, warm





More Sophisticated

- Pressure map
- Biothesiometer
- Toe- Brachial index, Ankle Brachial index
- Doppler USG
- Transcutaneous oxygen

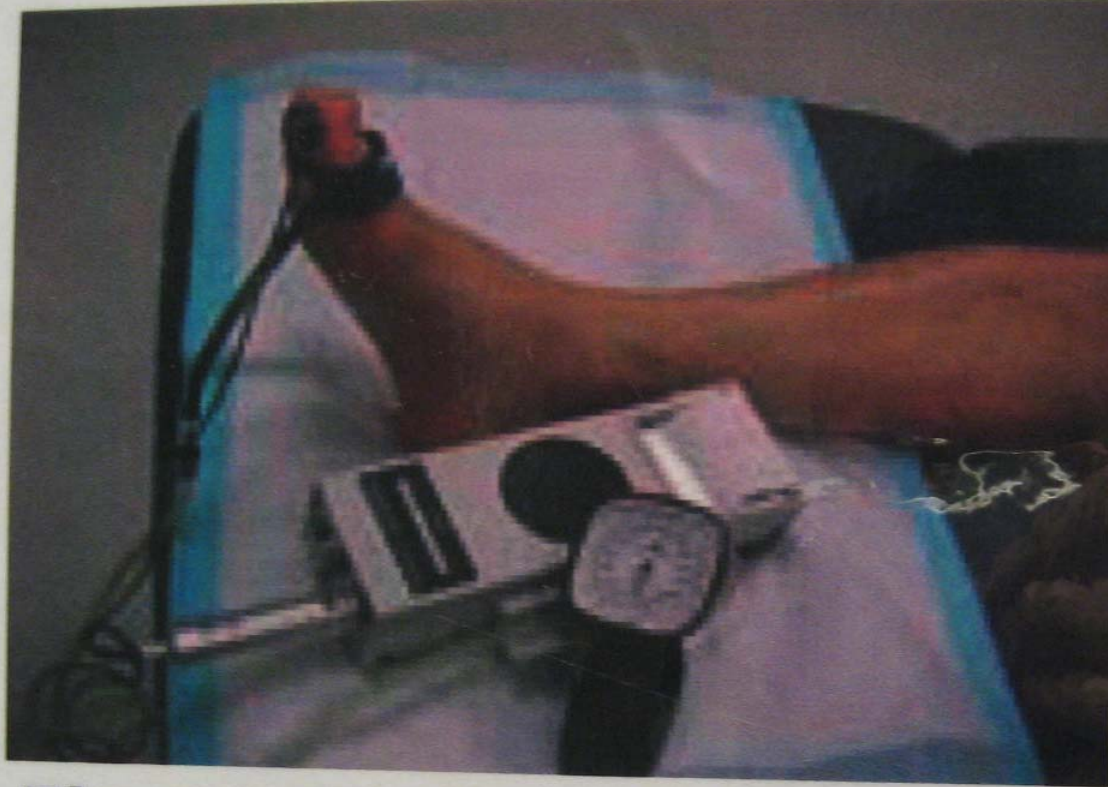
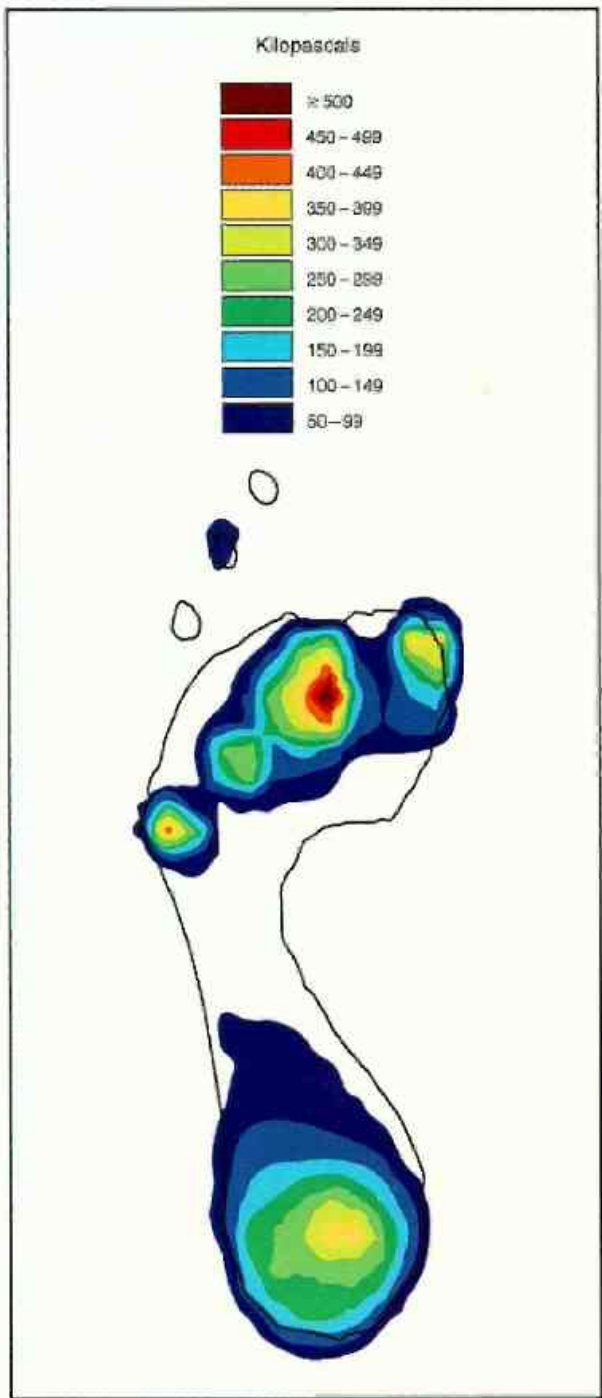


Figure 6

Toe Brachial Index (TBI):

- Normal value is >0.7
- Due to a high incidence of arterial calcification in diabetics, evaluation of TBI can be a better indicator for peripheral vascular disease





B



C



Comprehensive Foot Examination

Frykberg D.G.

Dermatologic

- skin status: color, thickness, dryness, cracking
- sweating
- infection: check between toes for
- fungal infection
- ulceration
- calluses/blistering: hemorrhage into callus?

Musculoskeletal

- deformity
e.g., claw toes, prominent metatarsal heads, Charcot joint
- muscle wasting (guttering between metatarsals)

Neurological assessment

- 10-g monofilament 1 of the following 4
- vibration using 128-Hz tuning fork
- pinprick sensation
- ankle reflexes
- VPT

Vascular assessment

- foot pulses
- ABI, if indicated



Comprehensive Foot Examination

Frykberg D.G.

Comprehensive foot examination and risk assessment

Table 4—Risk classification based on the comprehensive foot examination.

| Risk category | Definition | Treatment recommendations | Suggested follow-up |
|---------------|--------------------------------|---|--|
| 0 | No LOPS, no PAD, no deformity | <ul style="list-style-type: none">• Patient education including advice on appropriate footwear. | Annually (by generalist and/or specialist) |
| 1 | LOPS ± deformity | <ul style="list-style-type: none">• Consider prescriptive or accommodative footwear.• Consider prophylactic surgery if deformity is not able to be safely accommodated in shoes. Continue patient education. | Every 3–6 months (by generalist or specialist) |
| 2 | PAD ± LOPS | <ul style="list-style-type: none">• Consider prescriptive or accommodative footwear.• Consider vascular consultation for combined follow-up. | Every 2–3 months (by specialist) |
| 3 | History of ulcer or amputation | <ul style="list-style-type: none">• Same as category 1.• Consider vascular consultation for combined follow-up if PAD present. | Every 1–2 months (by specialist) |



Orthopaedic Shoes

- Wide toe box
- Padding on pressure sites
- Heel and toes protections

- Properly fitted
- Always socks
- No barefoot







Therapeutic Sandals



PREFABRICATED THERAPEUTIC SANDAL

OSSUR® Prefabricated Therapeutic Sandal is an active component in the treatment of pressure sores on the feet, often associated with diabetes. The Therapeutic Sandal can also be used for minor foot deformities and sensitive feet.

INDICATIONS:

- Hallux Rigidus
- Hallux Valgus
- Hammer / Claw toes
- Ingrown toenails
- Plantar sores
- Medial / Lateral sores / protuberances
- Calcaneal sores / protuberances
- Gait problems



| FEATURES: | BENEFITS: |
|--------------------------------|---|
| SIMPLE VELCRO STRAPPING SYSTEM | <ul style="list-style-type: none"> • Easy donning and doffing • Quick and easy adjustment |
| GOOD FIXATION OF THE FOOT | <ul style="list-style-type: none"> • Stable |
| FIRM HEEL COUNTERS | <ul style="list-style-type: none"> • Ankle stability |
| LIGHTWEIGHT | <ul style="list-style-type: none"> • Provides ease when walking |

PRODUCT NUMBERS Prefabricated Therapeutic Sandals

| Part # | EURO SIZE | UK SIZE | Part # | EURO SIZE | UK SIZE |
|----------|-----------|---------|----------|-----------|---------|
| O-451035 | 35 | 3 | O-451042 | 42 | 8 |
| O-451036 | 36 | 4 | O-451043 | 43 | 8½ |
| O-451037 | 37 | 4½ | O-451044 | 44 | 10 |
| O-451038 | 38 | 5½ | O-451045 | 45 | 11 |
| O-451039 | 39 | 6½ | O-451046 | 46 | 12½ |
| O-451040 | 40 | 7 | O-451047 | 47 | 12 |
| O-451041 | 41 | 7½ | O-451048 | 48 | 13 |

PRODUCT NUMBERS Insoles for Therapeutic Sandals

| Part # | EURO SIZE | UK SIZE | Part # | EURO SIZE | UK SIZE |
|----------|-----------|---------|----------|-----------|---------|
| O-431035 | 35 | 3 | O-431042 | 42 | 8 |
| O-431036 | 36 | 4 | O-431043 | 43 | 8½ |
| O-431037 | 37 | 4½ | O-431044 | 44 | 10 |
| O-431038 | 38 | 5½ | O-431045 | 45 | 11 |
| O-431039 | 39 | 6½ | O-431046 | 46 | 12½ |
| O-431040 | 40 | 7 | O-431047 | 47 | 12 |
| O-431041 | 41 | 7½ | O-431048 | 48 | 13 |

COLOR: Black / Brown - Only available in pairs





Treatment

- Glycaemic control
 - HbA1c monitor
- Control other risks factors
 - Alcohol consumption
 - Smoking
 - Hypertension control
 - Lipid profile
- Daily foot examination by patient
 - Yearly foot examination by Family physician
- Regular exercise
- Shoe wear





糖尿病患者護腳須知

- 每天用鏡子檢查雙腳是否有水泡、紅腫、破皮。
- 每天穿鞋前仔細檢查鞋內是否有異物。
- 每天要洗淨雙腳，且腳趾間要保持乾燥。
- 每天擦拭嬰兒油、凡士林以防止足部乾裂。
- 先穿襪子再穿鞋。
- 不赤腳行動，更避免穿涼鞋。
- 不剪老繭、雞眼，亦不可隨便塗任何藥物。
- 不用熱水袋、熱墊或電毯及泡熱水取暖。
- 修剪趾甲時，用銼刀修平為佳，以免受傷。
- 測量水溫時，要用手腕測試，不可直接用腳測試。
- 慎選質軟、透氣散熱的圓頭皮鞋，鞋墊需柔軟附彈性。



Treatment

- Neuralgic pain
 - NSAID
 - Tricyclic antidepressant: amitriptyline
 - Citalopram
 - Gabapentin, Pregabalin
 - Carbamazepine
 - Opioid : tramadol
 - Topical: capsaicin cream , primrose oil
- Bed cradle
- Acupuncture
- Magnetic, Laser, Light therapy

CME points for doctors
&
CNE points for nurses

5th Asia Pacific Conference on Diabetic Limb Problems

te : 11 – 12 October 2008

ne : 8.30am – 5.30pm

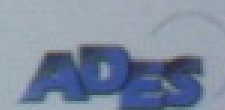
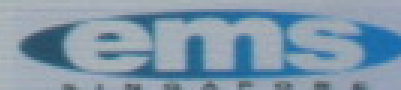
ue : NUH Auditorium


Kent Ridge Wing, Level 3

enquiries & registration, please call 6772 4333

email dosnathe@nus.edu.sg

Supporte





International Consensus on Diabetic Foot

- 5 cornerstones of management
 - Regular inspection and examination
 - Foot at risk
 - Education: patient, family, Healthcare
 - Footwear
 - Non-ulcer pathology

| | |
|--|--|
| Skin red, blue or black | <ul style="list-style-type: none"> ■ Discover the cause and fix it, e.g. shoe fitting ■ Irritation from shoes or early sign of problem ■ Call doctor to report the problem |
| Hair loss in foot/toe | <ul style="list-style-type: none"> ■ Irritation from shoes ■ Blood flow problem ■ Show it to your doctor on next visit |
| Blister | <ul style="list-style-type: none"> ■ Discover the cause, skin friction or rubbing ■ May need new shoes ■ Do NOT break the blister, Leave it INTACT ■ Cover with sterile gauze and tape ■ Call your doctor if it becomes red, or persistent for >4 days |
| Skin Break | <ul style="list-style-type: none"> ■ Wash with soap and clean water ■ Blot dry ■ Sterile gauze and tape ■ Call doctor if it oozes, persistent for >4 days ■ Examine Toe webs and sole ! |
| Calluse, Corn | <ul style="list-style-type: none"> ■ Show it to doctor on next visit ■ Do NOT use OTC products ■ Do NOT rub, cut or file on calluse or thick skin |
| Web space Peeling, cracking, oozing | <ul style="list-style-type: none"> ■ Tinea ■ Use sandal in pools, bath house ■ Call to see your doctor ■ Avoid scratching |
| Moisture in web | <ul style="list-style-type: none"> ■ Dry toes web with paper tower ■ Talc powder |
| Pins and needles | <ul style="list-style-type: none"> ■ Call your doctor |
| Sores | <ul style="list-style-type: none"> ■ Call your doctor |
| Ingrowing toe nails | <ul style="list-style-type: none"> ■ Do not treat it at home ■ Call your doctor |



Conference Conclusion

- Prevention
 - Primary care
- Annual foot Screening
- Footwear design
 - Fashionable
 - Culturally acceptable
 - Affordable
 - Gender specific
 - Therapeutic sandals



Non-limb-threatening infection

Oral regimen

- Cephalexin
- Clindamycin
- Dicloxacillin
- Amoxicillin–clavulanate

Parenteral regimen

- Cefazolin
- Oxacillin or nafcillin
- Clindamycin

Limb-threatening infection

Oral regimen

- Fluoroquinolone and clindamycin

Parenteral regimen

- Ampicillin–sulbactam
- Ticarcillin–clavulanate
- Cefoxitin or cefotetan
- Fluoroquinolone and clindamycin

Life-threatening infection

Parenteral regimen

- Imipenem–cilastatin
- Vancomycin, metronidazole, and aztreonam
- Ampicillin–sulbactam and an aminoglycoside

*These regimens may require adjustment if the patient has a history of allergies or if there are clinical or epidemiologic factors suggesting unusual pathogens. Doses should be commensurate with the severity of infection, with adjustment for renal dysfunction when indicated.

Upon Assessment

