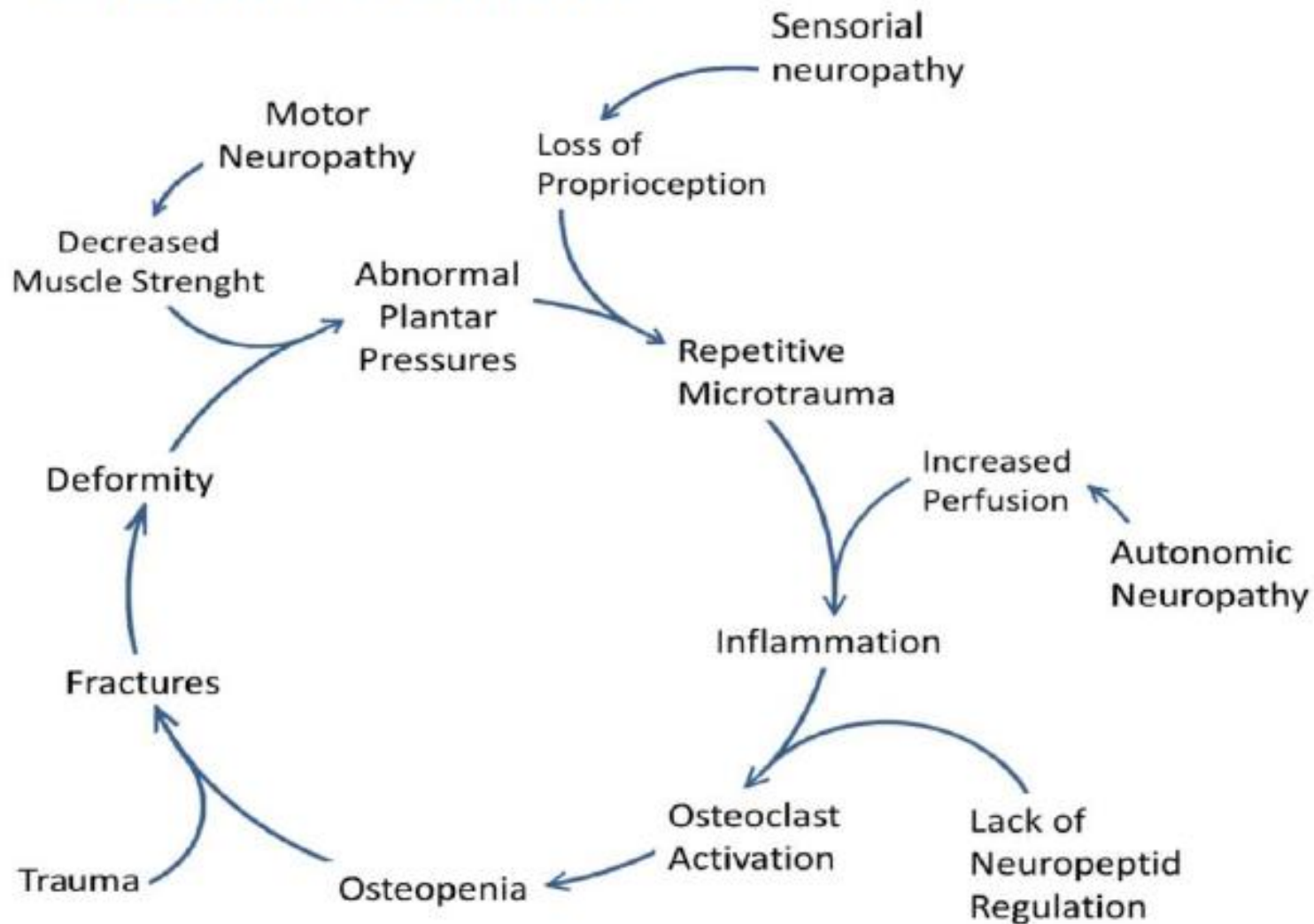


Foot Pressure Analysis and Simple off loading for uncomplicated callus & ulcers

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**Department of Rehabilitation Medicine
Faculty of Medicine, Chiang Mai University**

Cycle of pathophysiology of Charcot osteoarthropathy.






Long term sequel of diabetic foot

- **Motor neuropathy**
 - Clawing of toes, intrinsic muscle atrophy
 - Prominent metatarsal heads
 - High foot pressure
- **Sensory neuropathy**
- **Autonomic neuropathy**
 - Anhydrosis, atrophic skin, callous formation

Mechanical stress

- High-pressure penetrating injury
- Low pressure applied for a prolonged period of time
- Repetitive stress of walking

Common type of ulcer in DM

Ulcer Type	Pathophysiology	Location
Diabetic (neuropathy) 	Peripheral neuropathy secondary to small or large vessel disease in chronic, uncontrolled diabetic	Usually lower extremities, plantar area 
Ischemic 	Reduction in blood flow to tissue caused by peripheral arterial disease, hypertension, hyperlipidemia or smoking	Usually distal lower extremities, tip of toes

Pressure analysis



VALGUS

CAVUS

FLAT

NORMAL

VARUS

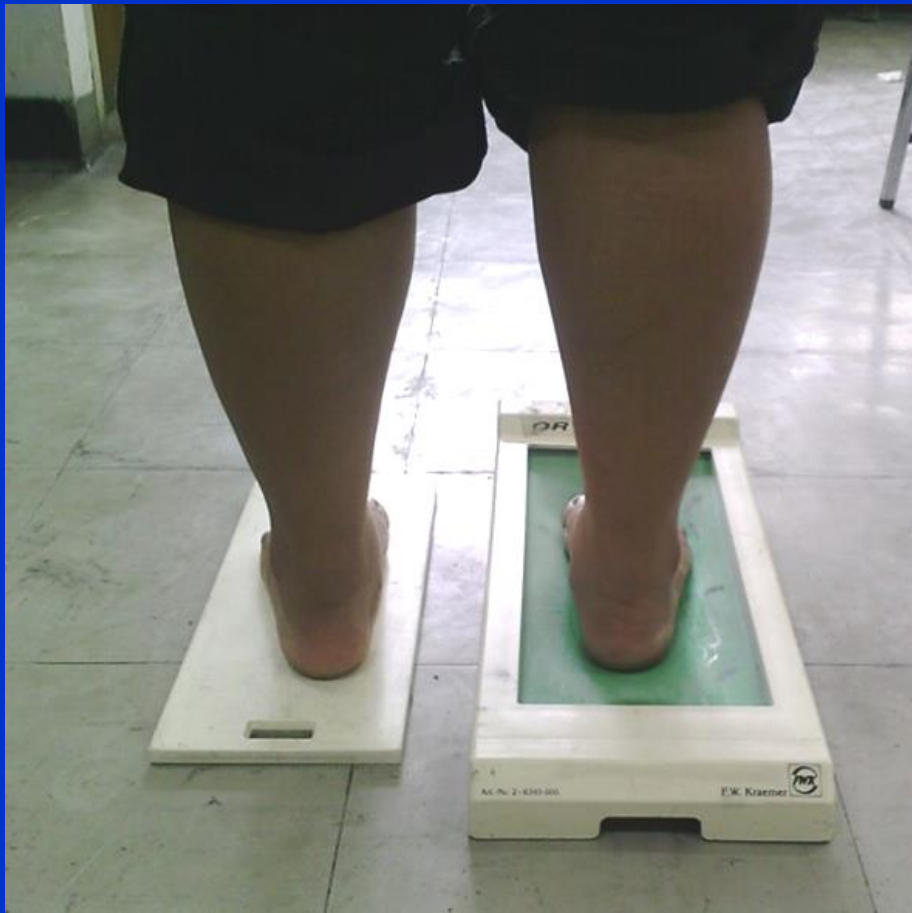
Type of foot deformity

Harris Mat

Standard device

Measure the footprint based on ink and paper





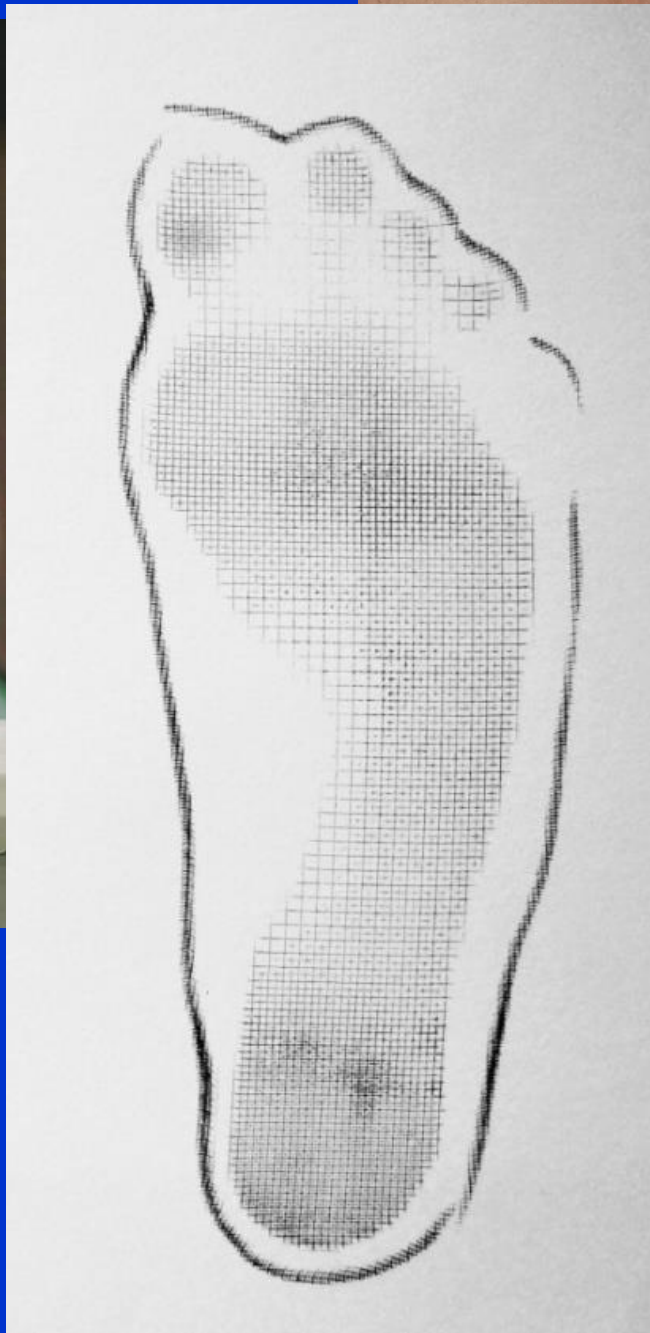
Orthoprint®



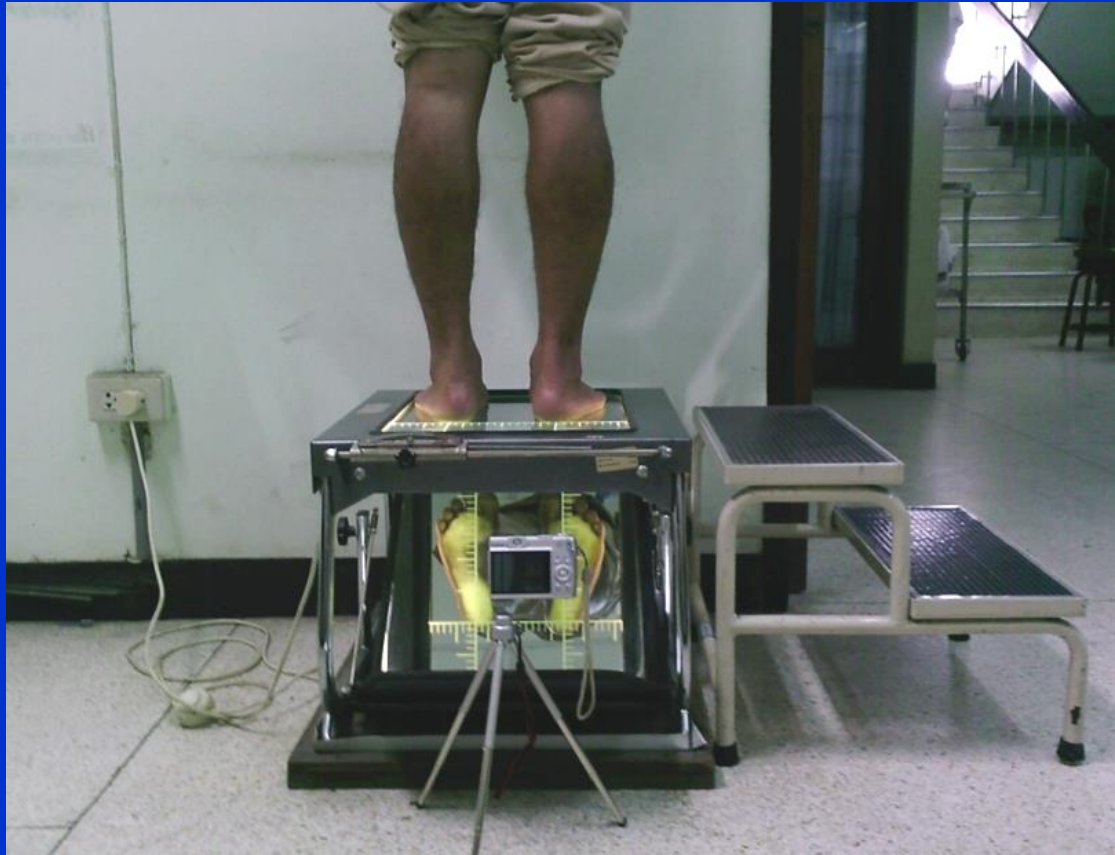
Harris Mat



Orthoprint®



Harris Mat



Podoscope



Mirror and side illumination

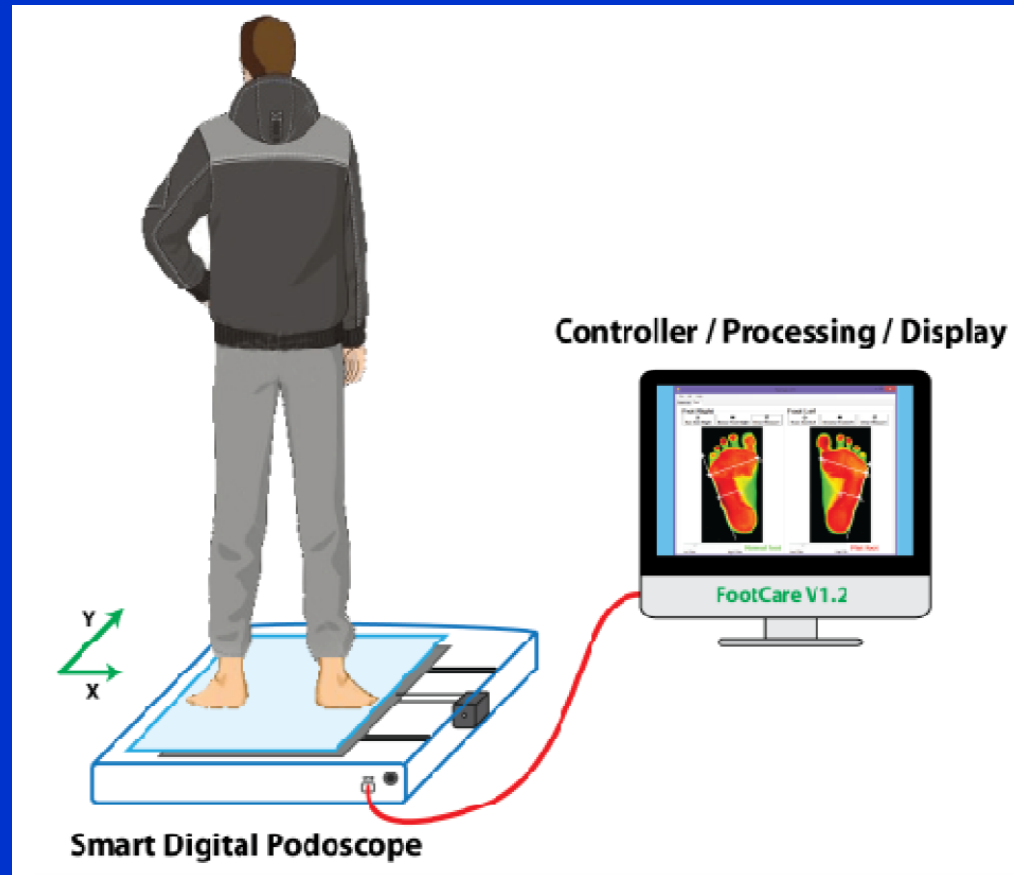


Camera base

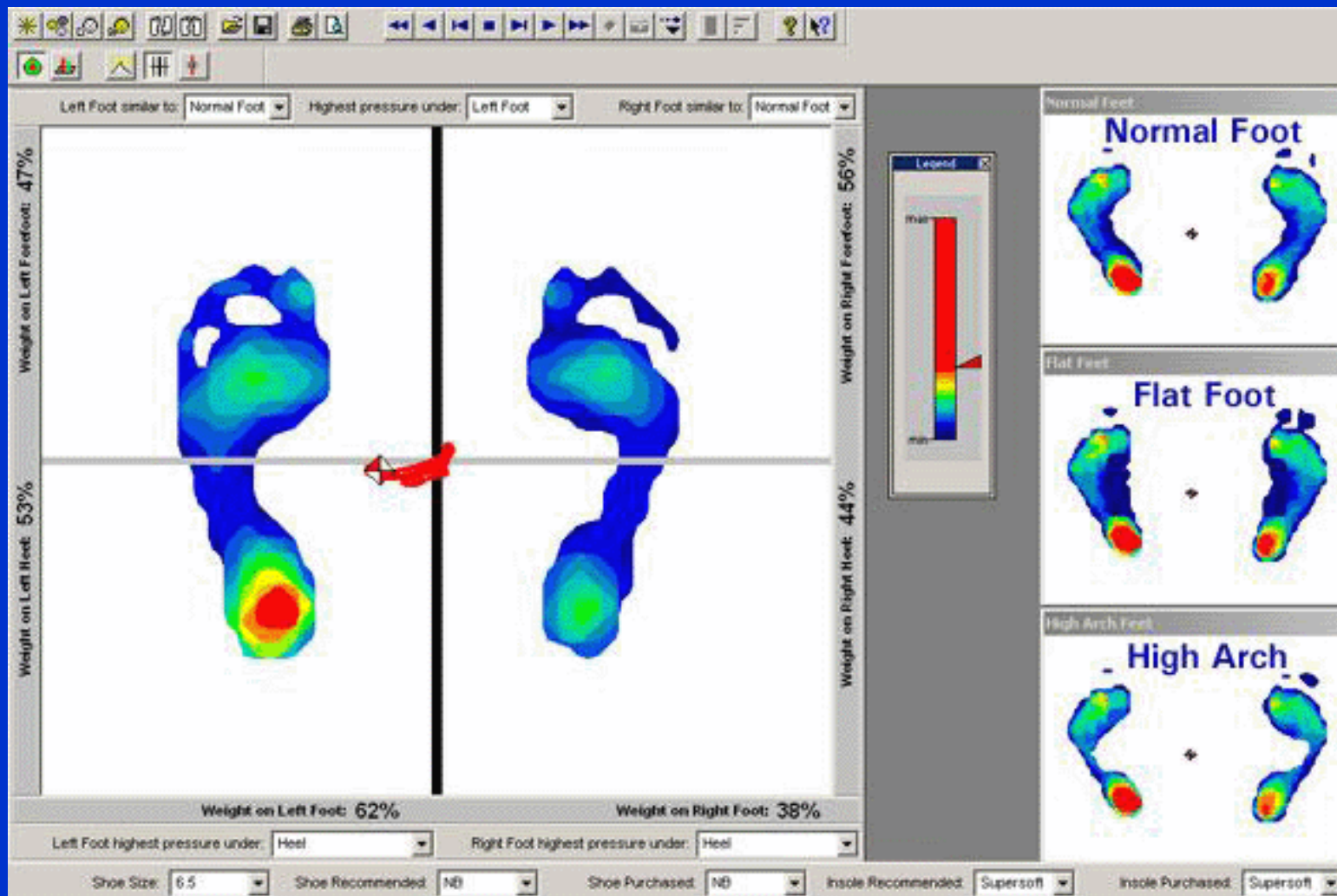


Optical scanner

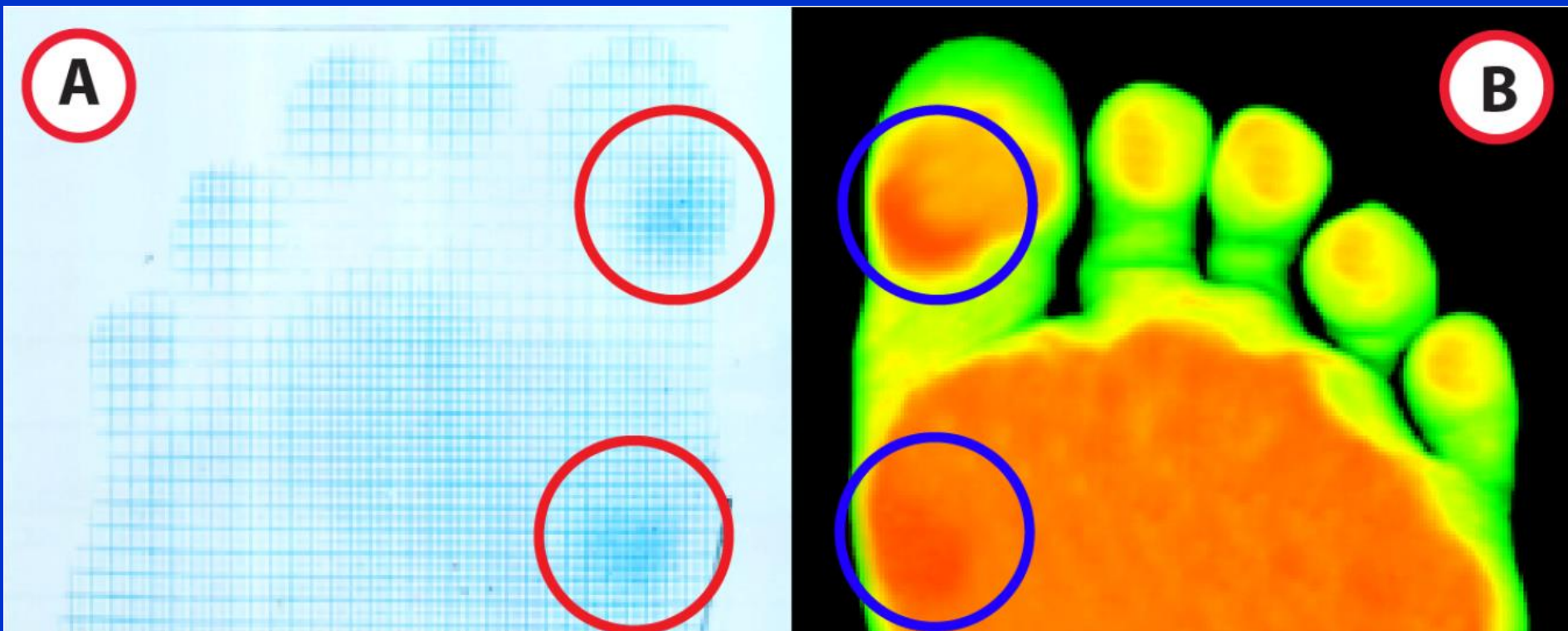
Digital podoscope



Overall system smart digital podoscope



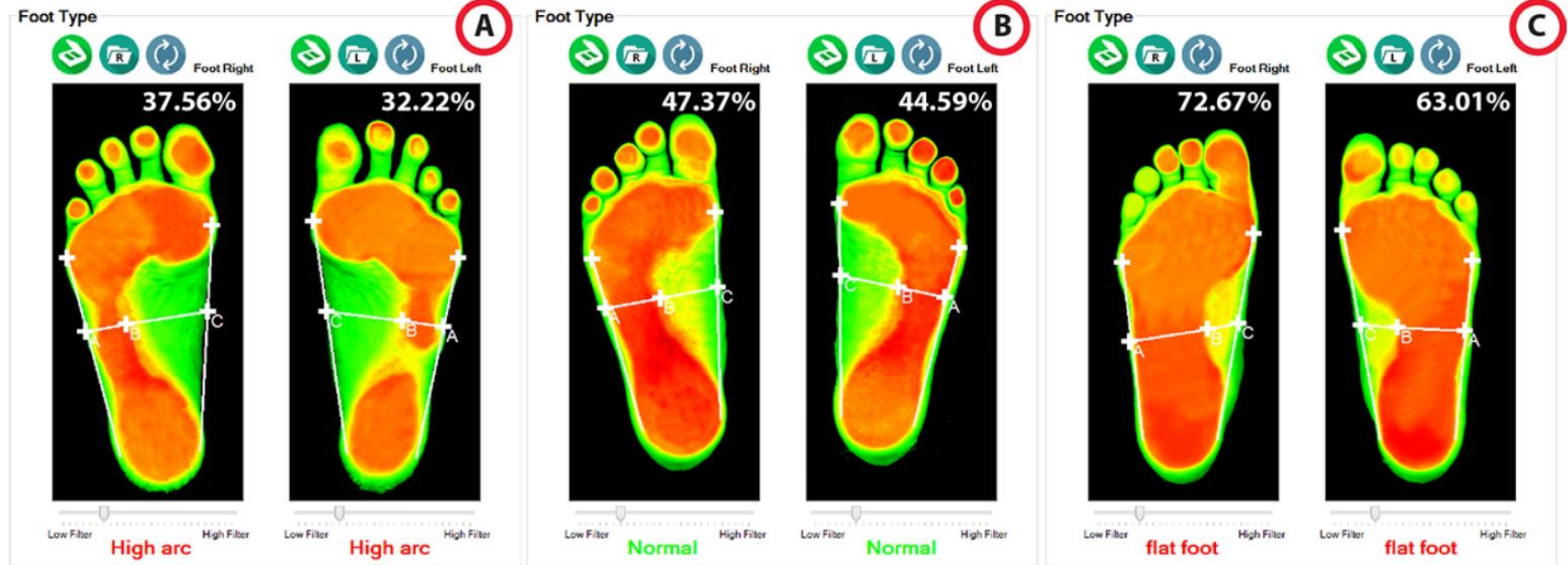
Foot scan



Pressure ulcer point

A: Footprint image from Harris Mat

B: Footprint image from Digital Podoscope



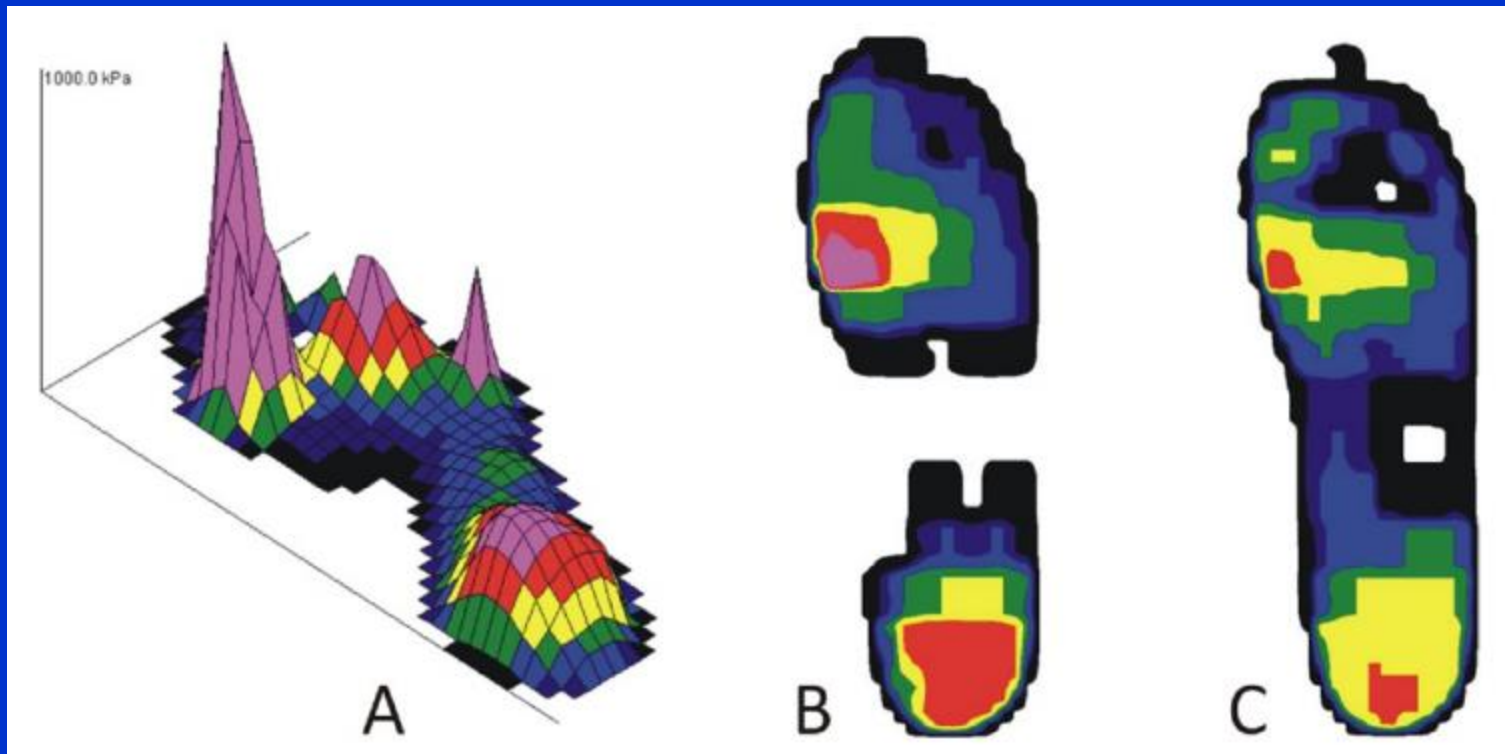
A: High arch foot

B: Normal foot

C: Flatfoot

Why is off-loading need?

- Plantar pressure → plantar ulcer
- Ulceration is often a precursor of LEA

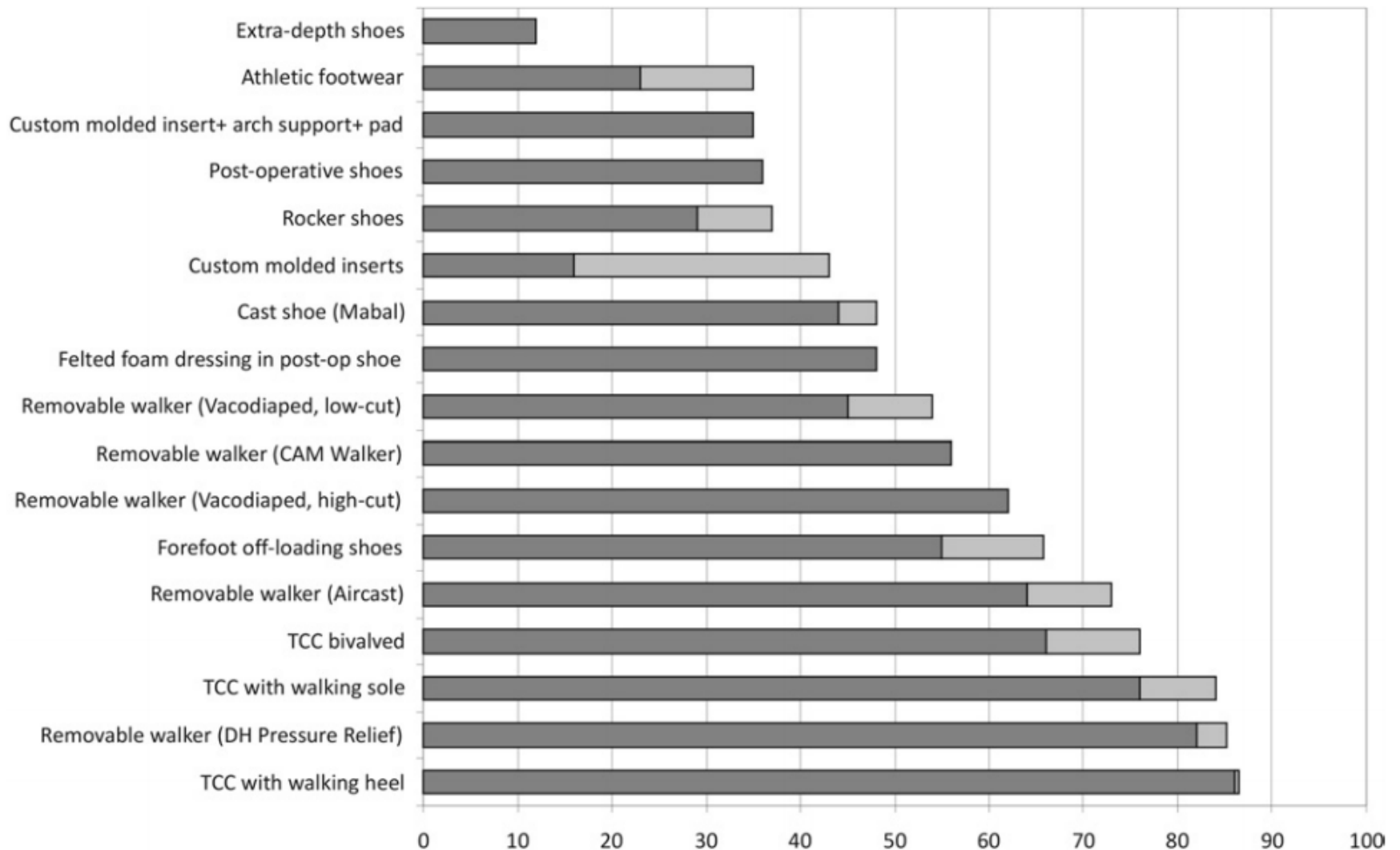


A: Barefoot walking B: Using flat cushioning insole C: Using custom-made insole

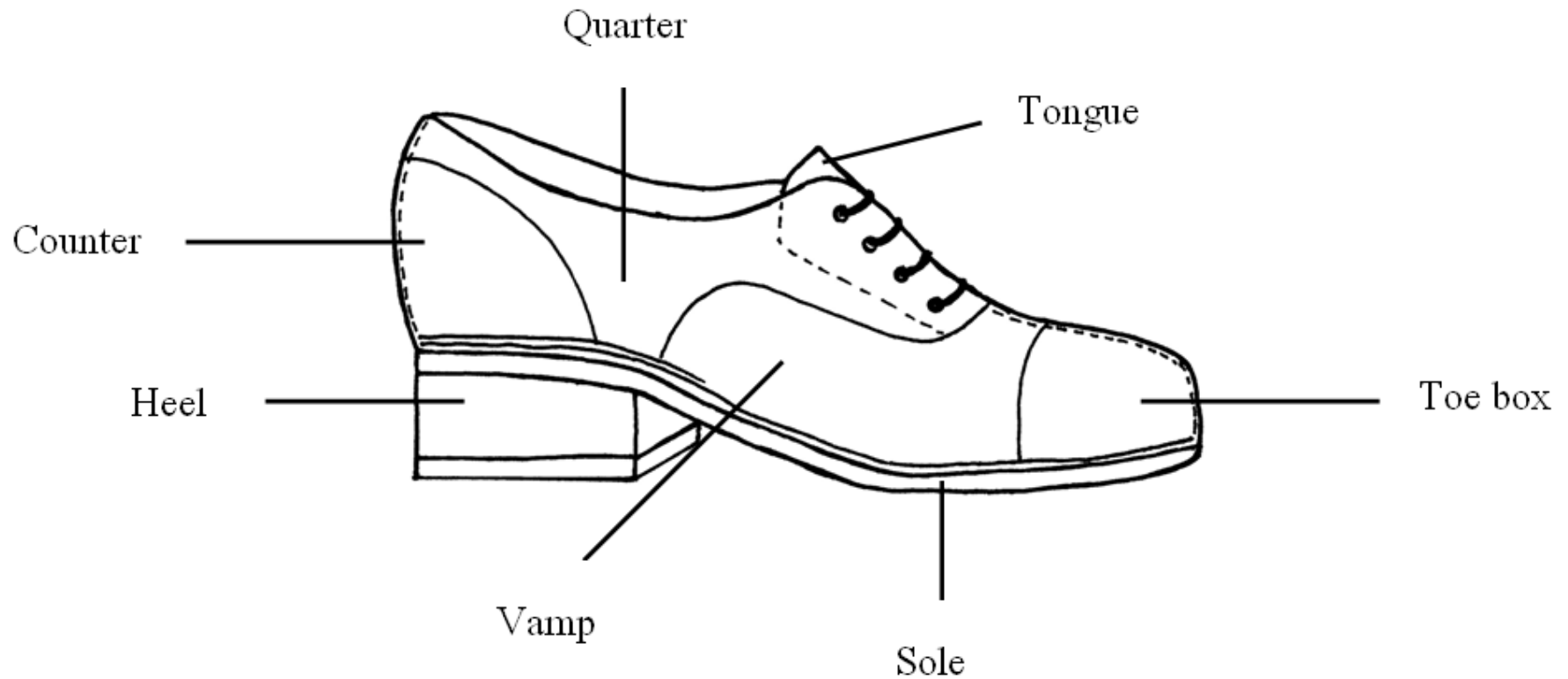
2015 IWGDF Guidance

- Prevention of foot ulcers in at-risk patients with diabetes
- Footwear and offloading to prevent and heal foot ulcers in diabetes
- Diagnosis, prognosis, and management of peripheral artery disease in patients with foot ulcers in diabetes
- Diagnosis and management of foot infections in persons with diabetes
- Interventions to enhance healing of chronic ulcers of the foot in diabetes

Pressure off-loading



Component of shoe



Type of footwear

Diabetic Foot Problems in Tertiary Care Diabetic Clinic in Thailand

Natapong Kosachunhanun, MD¹, Siam Tongprasert, MD¹, and Kittipan Rerkasem, MD, PhD¹

Table 3. Type of Footwear Used by Patients

Type of Footwear	Percentage
Slippers	67.2
Low heel shoes	8.8
High heel shoes	1.4
Sports shoes	3.5
Others	19.1

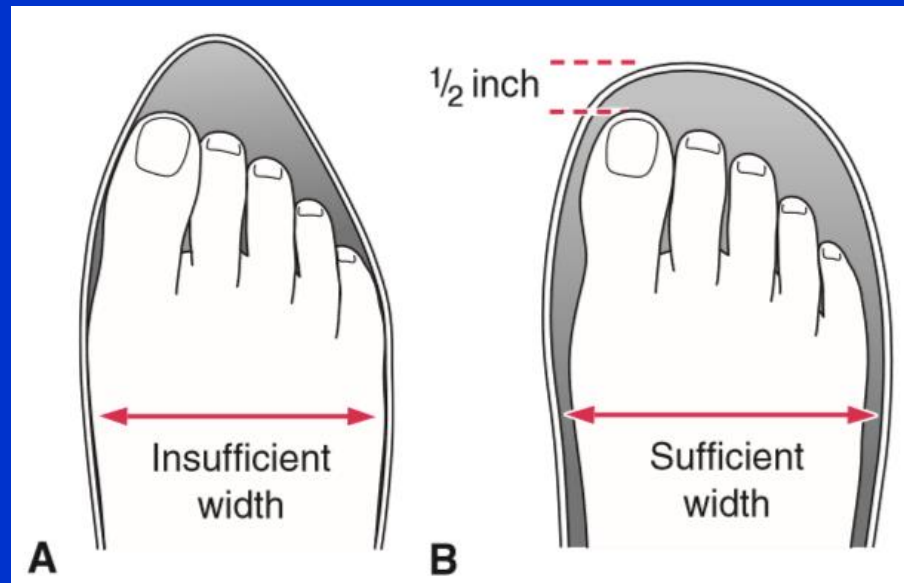
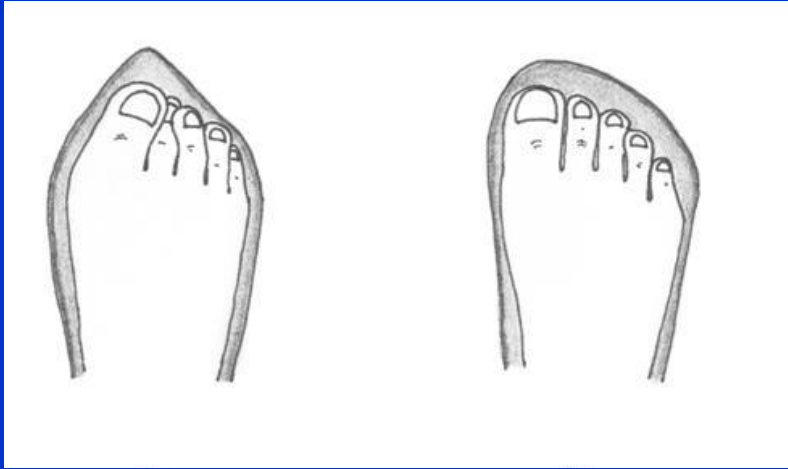
Abstract

Foot problems in patients with diabetes cause substantial morbidity and may lead to lower extremity amputations. These risks may be reduced by appropriate screening and intervention measures. Effective screening assigns the patient to a risk category and dictates both the type and frequency of appropriate foot interventions. Less than half of diabetic patients in tertiary care hospital in Thailand received annual foot examination and there are limited data available on the nature of foot problems in such setting. This study reported a cross-sectional data of 438 diabetic patients attend tertiary diabetic clinic in the university hospital in Northern Thailand. Neuropathy manifestations as skin dryness, limitation of joint mobility and insensate to monofilament was the most common manifestation of diabetic foot problems in this setting. Most patients were not protected by proper footwear. More effort is needed to educate diabetic patients about foot care and improve their choice and selection of footwear.

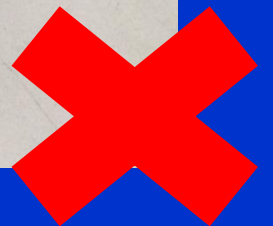
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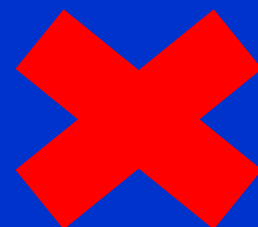
diabetes, foot problem, footwear, multidisciplinary team

Type of footwear











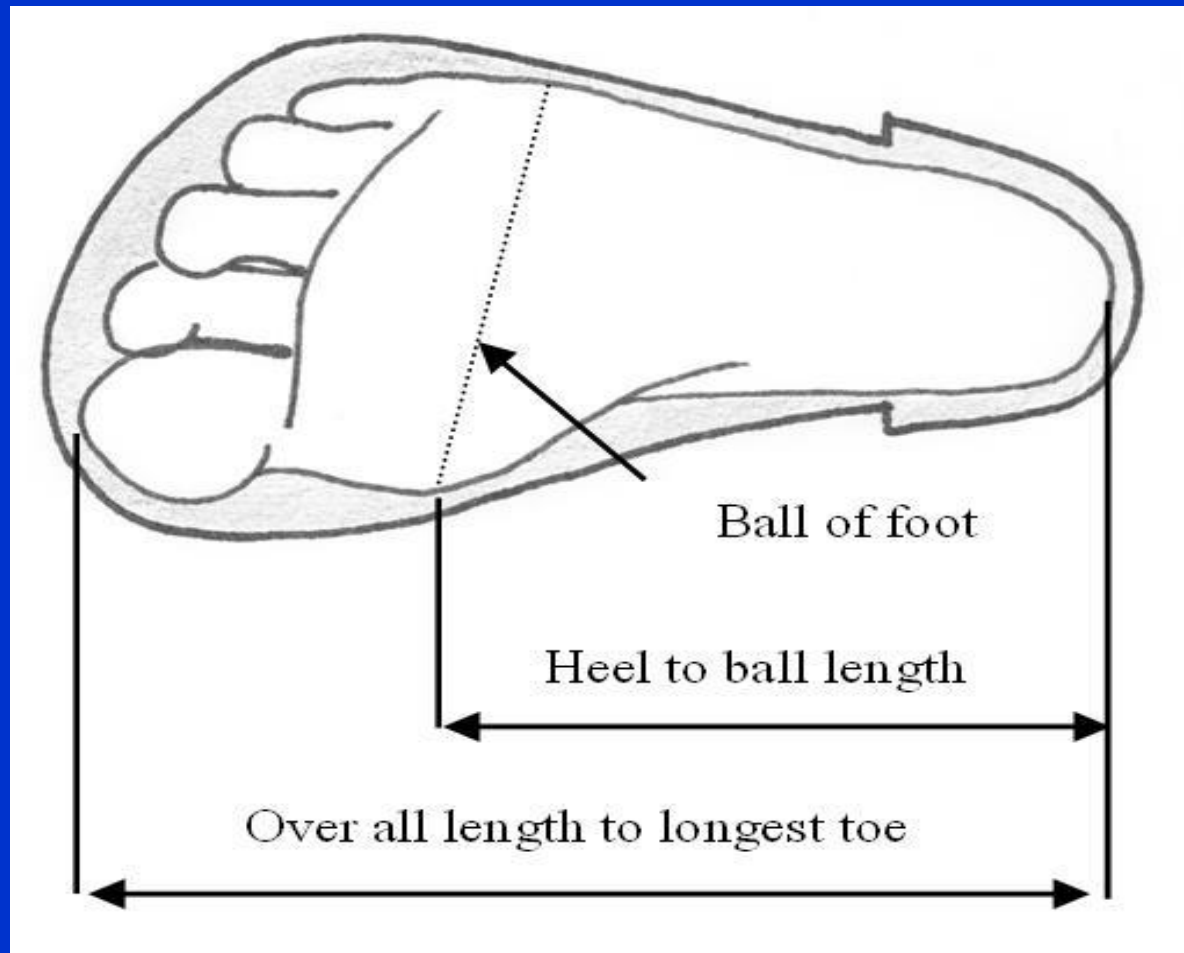




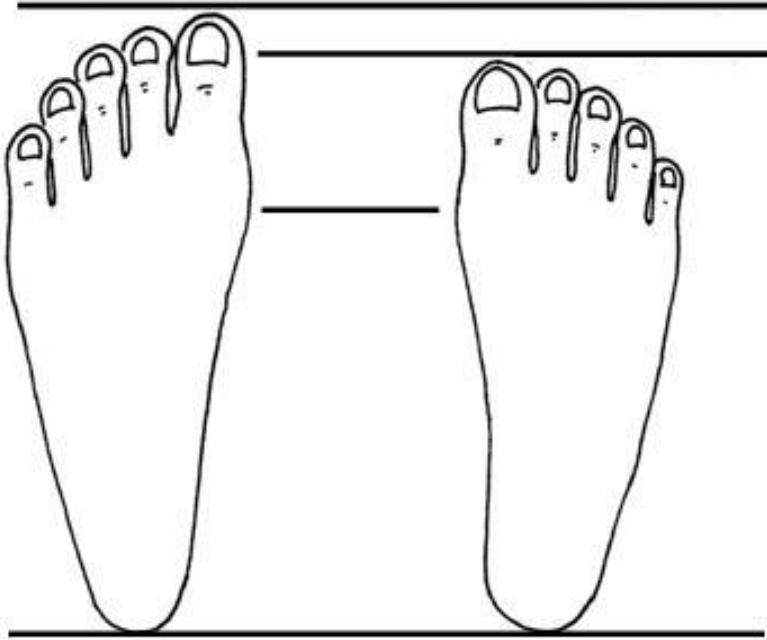




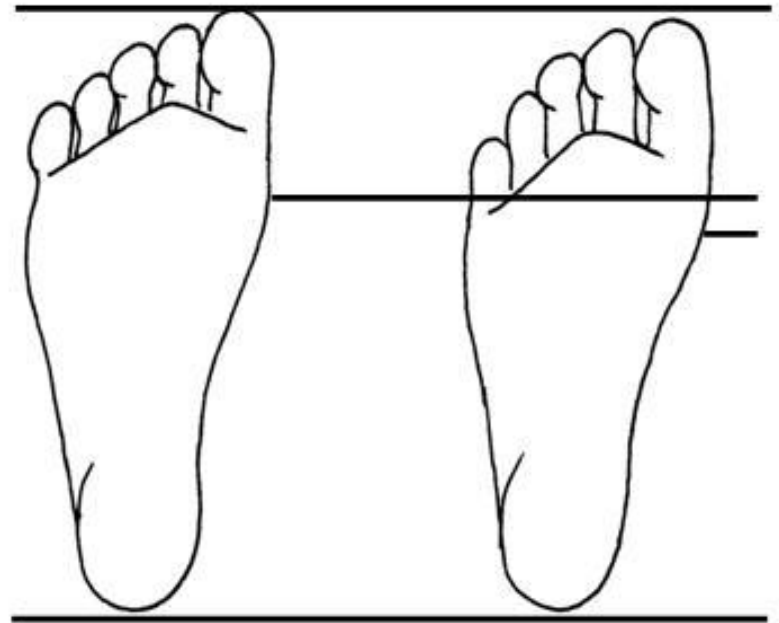
Size of shoes



Size of shoes



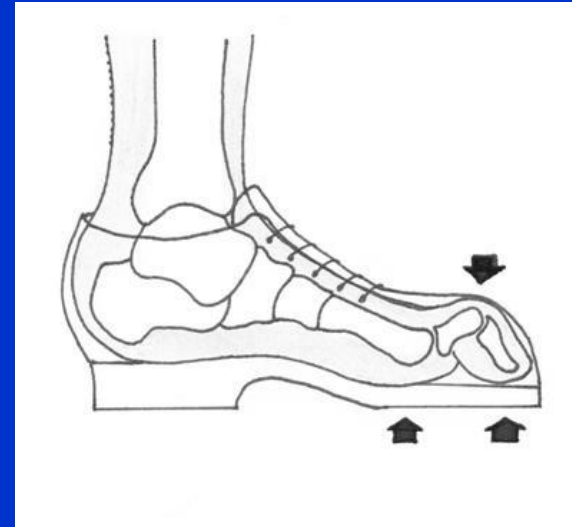
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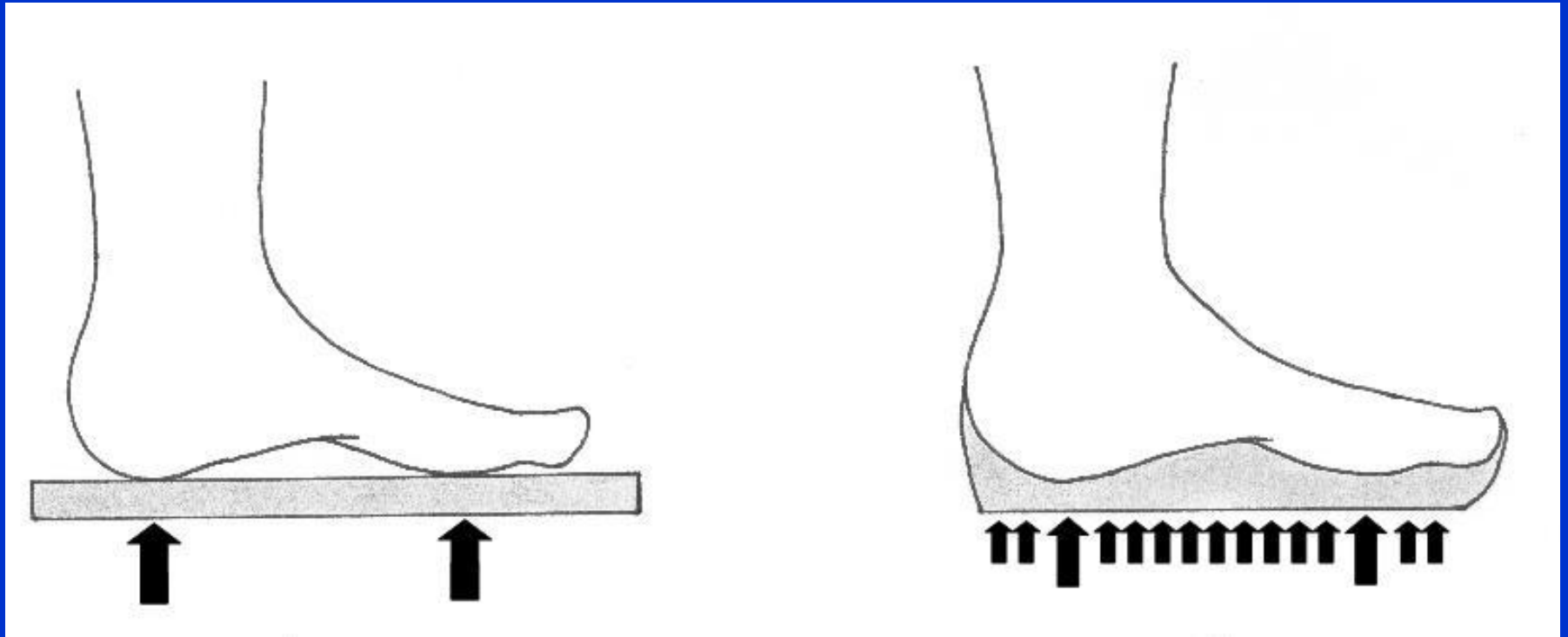


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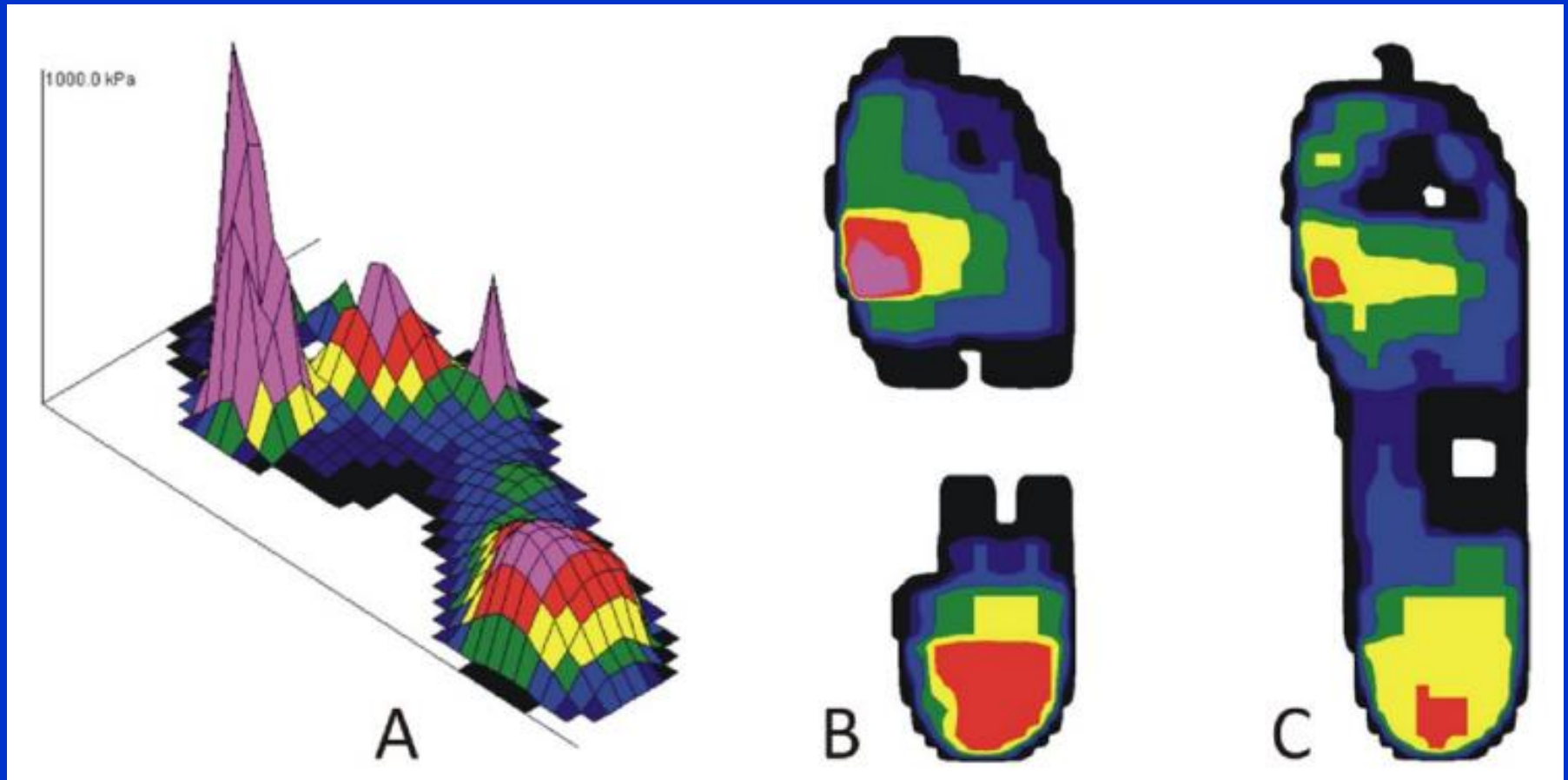
Shoe modification

Wide and high toe box





Custom molded shoe insert

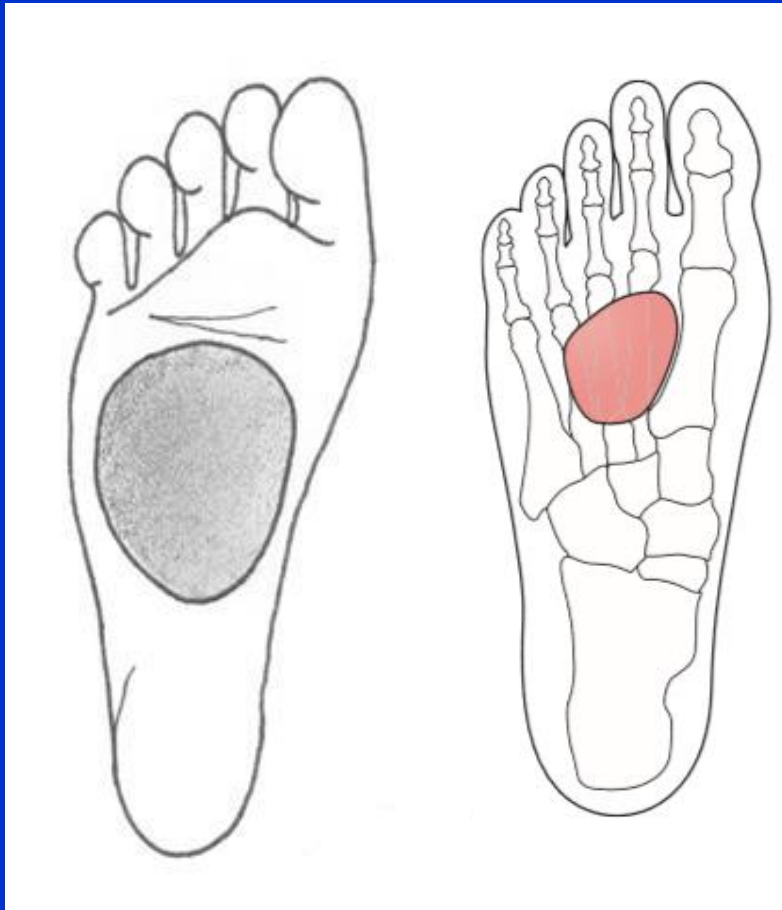


A: Barefoot walking

B: Using flat cushioning insole

C: Using custom-made insole

▪ Metatarsal pad

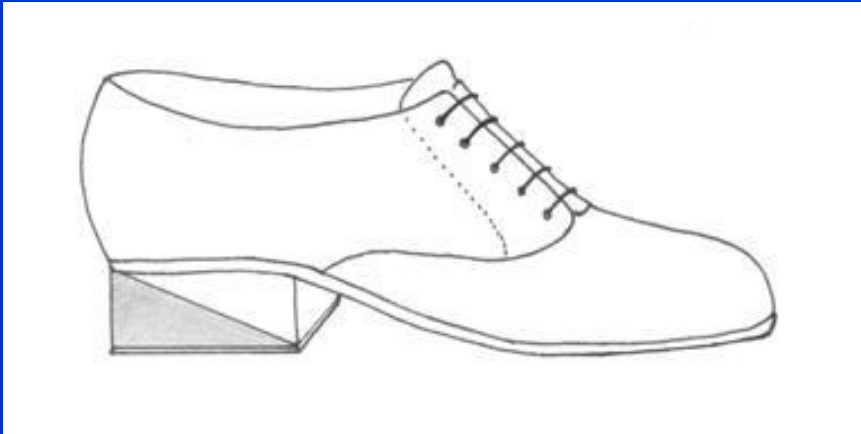


→ placed just proximal to the head

→ shift weight to metatarsal shafts (pressure-tolerant)

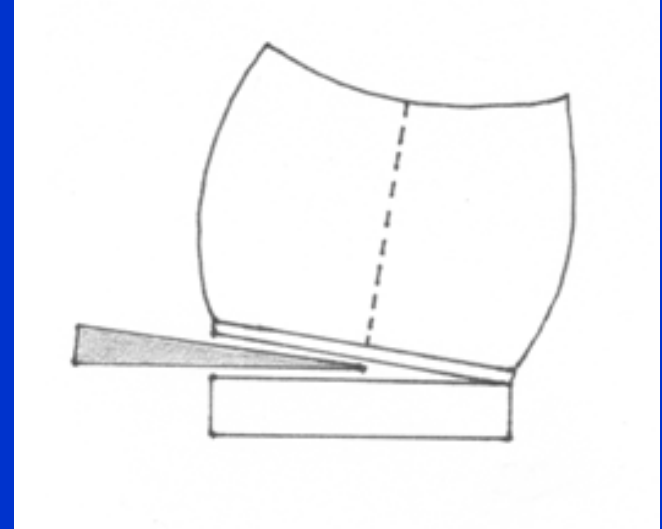


■ Cushion heel



- A wedge of softer or resilient material into the posterior part of the heel
- Reduce stress from heel and ankle

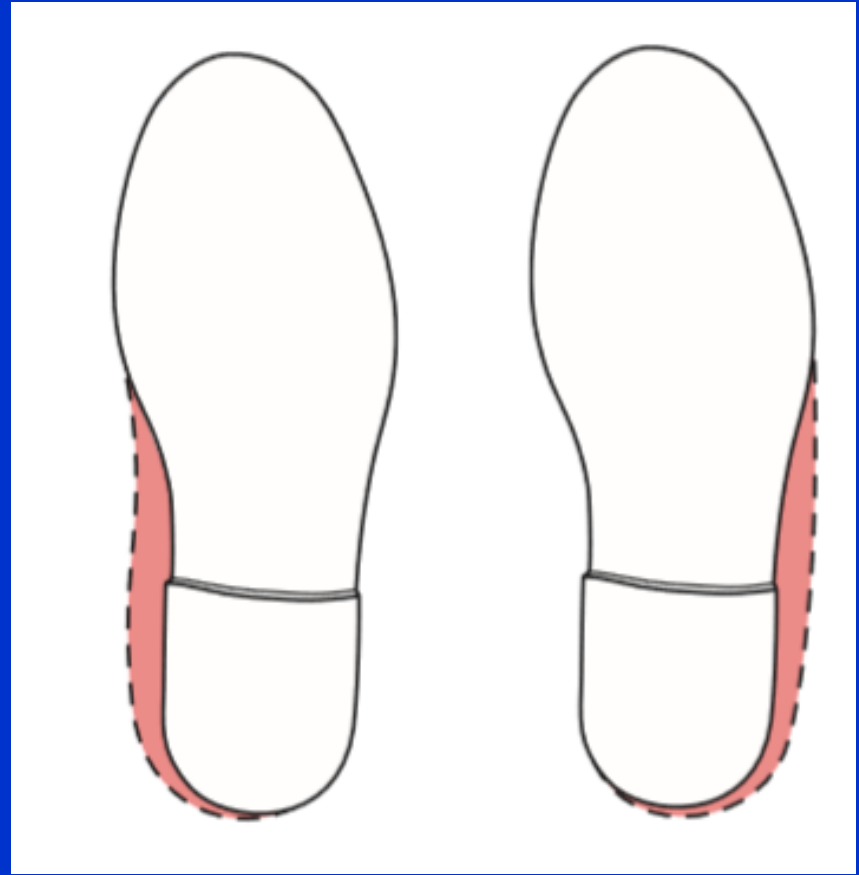
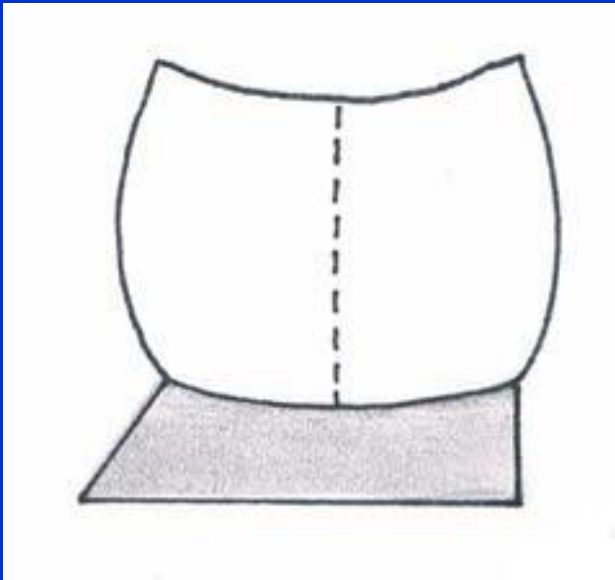
■ Wedge



- Hindfoot problem

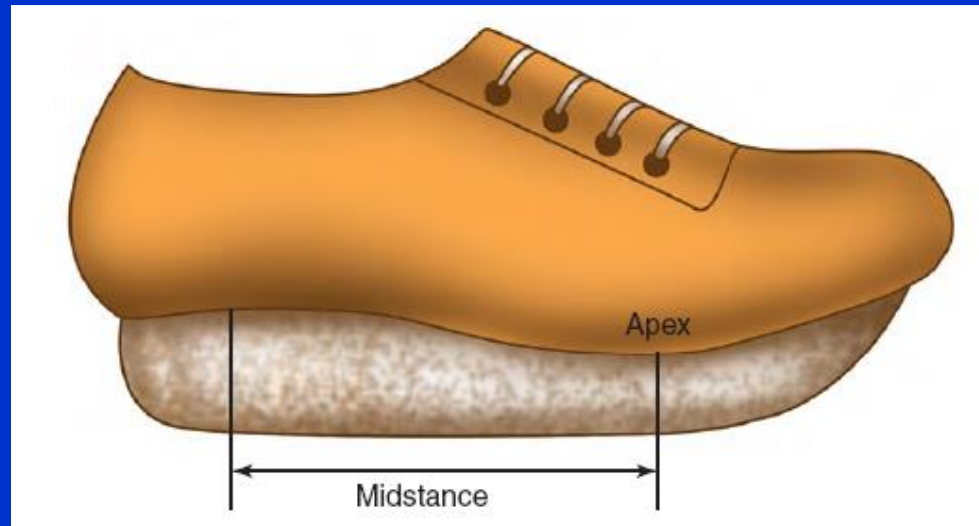
■ Flare

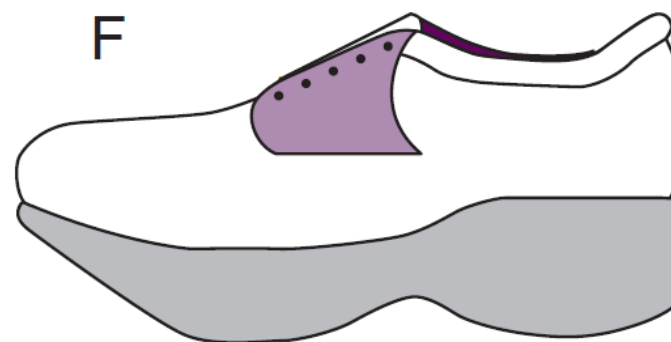
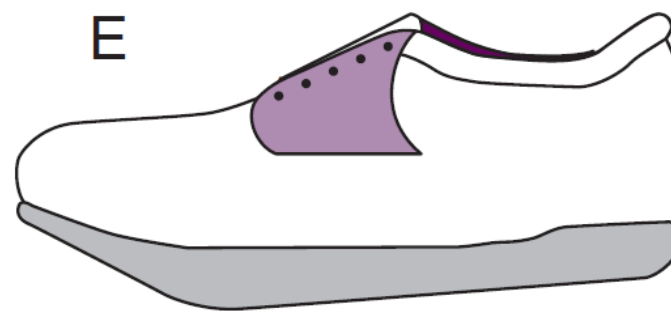
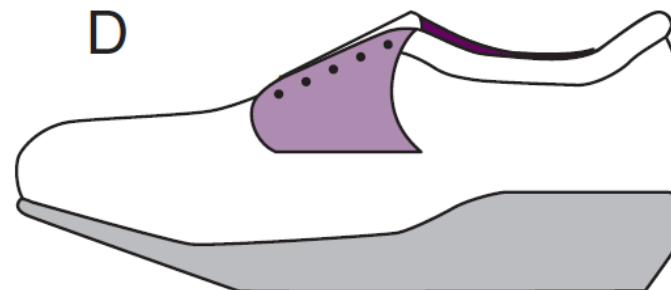
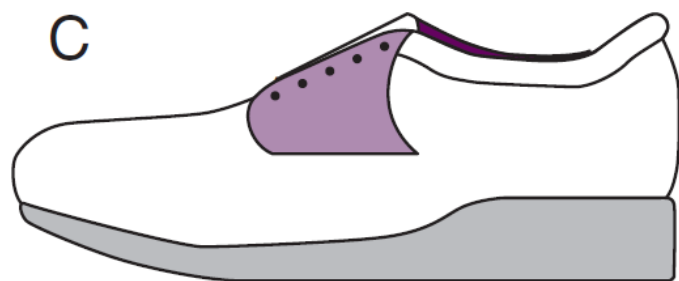
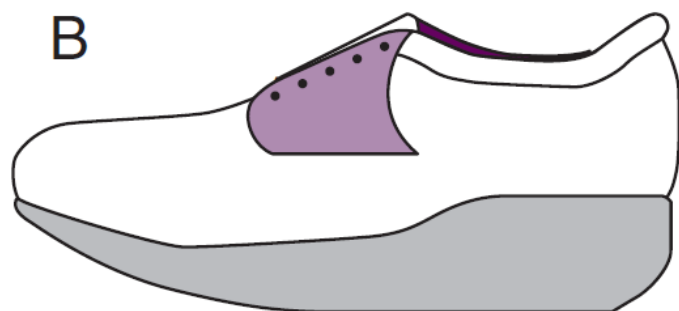
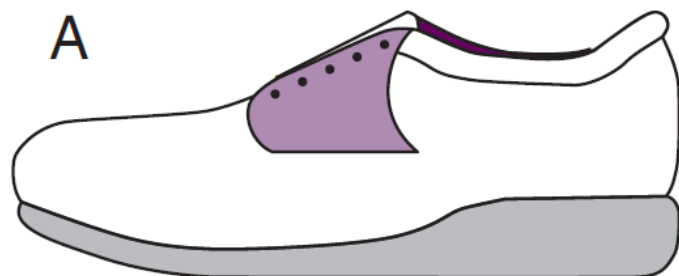
- Provide hindfoot stabilization
- Hindfoot problem

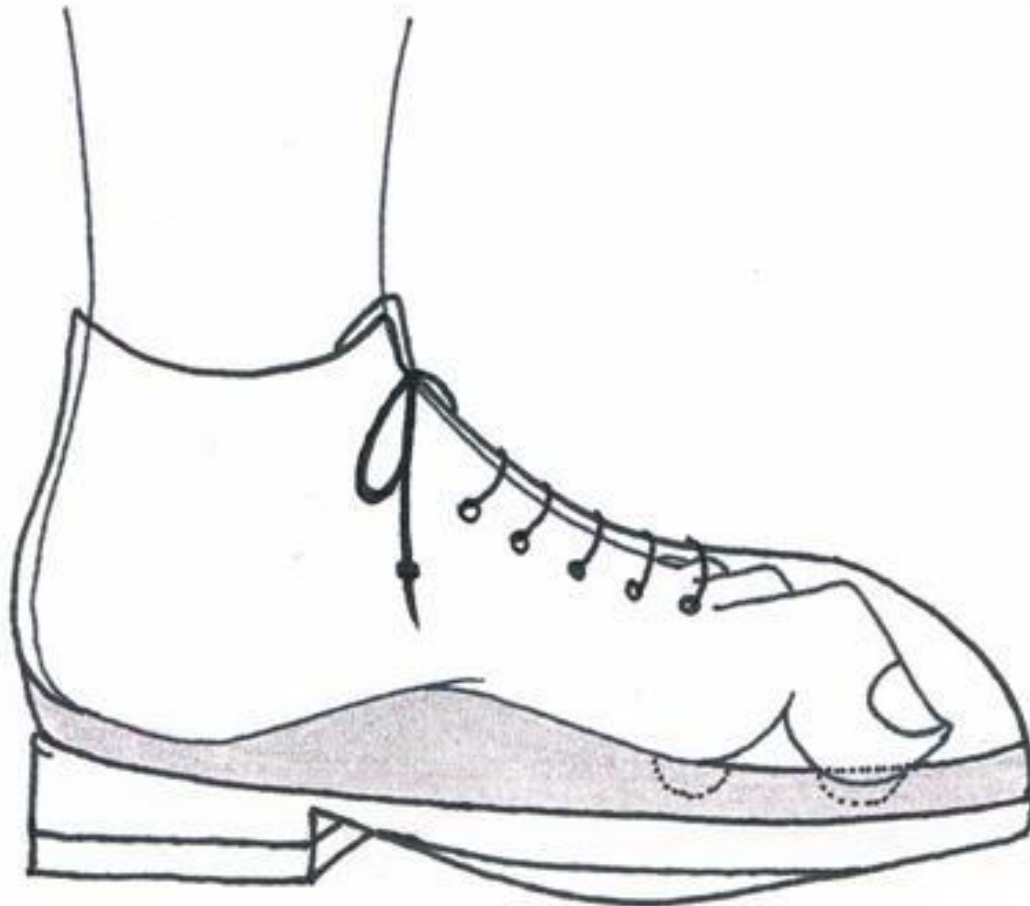


- **Rocker sole**

- Compensation for limited ankle dorsiflexion
- Relieve pressure under MT head or toe







Partial foot amputation

- Provide shoe filler
- Equalize weight bearing
- Protect and accommodate the remaining portion of the foot
- Improve the gait

Partial foot amputation

