

**Different Modalities of
Offloading in Cases of at Risk
Diabetic Foot**

Patients with diabetes are at an increased risk for developing foot ulcerations. The consequences of persistent and poorly controlled hyperglycemia lead to neuropathic and vascular abnormalities that cause foot deformities and ulceration

The precipitating factors for ulceration, in the neuropathic foot, include trauma to areas deprived of the protective sensation and other factors such as ill-fitting footwear and the unbalanced pressure distribution over bony prominences with callus formation from chronic irritation.

Early detection of potential risk factors for ulceration can decrease the frequency of wound development. It is recommended that all patients with diabetes undergo foot examinations at least annually to determine predisposing conditions to ulceration.

PERSON AT RISK



FOOT AT RISK

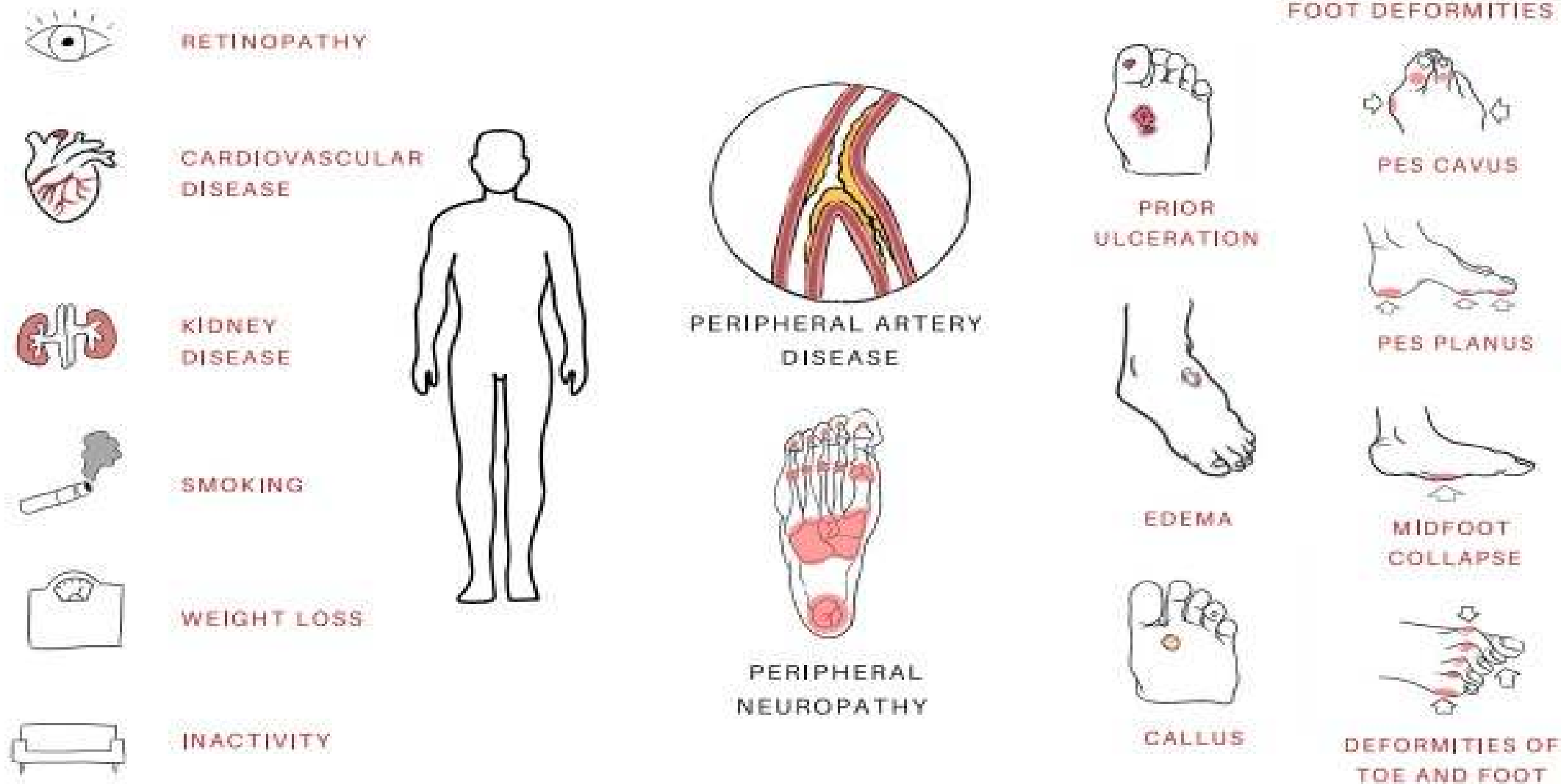


Figure 2—Person- and foot-specific factors interact to promote DFU risk and poor clinical outcomes.

- **Low risk:** — no risk factors present except callus alone.
- **Moderate risk:** — deformity
 - neuropathy
 - peripheral arterial disease.
- **High risk:**
 - previous ulceration or
 - previous amputation or
 - on renal replacement therapy or
 - neuropathy and peripheral arterial disease together or
 - neuropathy in combination with callus and/or deformity or
 - peripheral arterial disease in combination with callus and/or deformity.
- **Active diabetic foot problem:** — ulceration
 - infection
 - chronic limb-threatening ischaemia
 - gangrene
 - suspicion of an acute Charcot arthropathy, or an unexplained hot, swollen foot with a change in colour, with or without pain.

Offloading intervention

Any intervention undertaken with the intention of relieving mechanical stress (pressure) from a specific of the foot

includes:-

- Surgical offloading techniques.
- Offloading devices.
- Footwear.
- Other offloading techniques:-

Offloading devices

custom made or prefabricated device excluding footwear, subcategorised into non-removable or removable and knee-high or ankle-high devices.

- **Total contact cast**

Total contact casting (TCC) is often considered the gold standard device



Studies have shown that both TCC and knee-high removable walkers reduce peak pressure in the forefoot up to 87%, as they redistribute plantar pressure to the entire weight-bearing surface of the foot, as well as the lower leg, through the device wall

Removable cast walker alternative to TCC



Full length walker



Short length walker



- **Foot wear:** Footwear was further subcategorised into conventional and therapeutic footwear, including insoles and socks.
- **Other offloading techniques:** such as crutches and bed rest with bed pillows.

Characteristics of preventive foot wear



Broad toe box

Soft insole

Rigid outsole

Extra depth

Non traumatic lining

OFFLOADING SHOES

Forefoot offloading device



Rearfoot offloading device



- **Surgical offloading:** including Achilles tendon lengthening (ATL), metatarsal head (MTH) resection, osteotomy, arthroplasty, ostectomy, exostectomy, external fixation, flexor tendon transfer or tenotomy, and tissue fillers such as silicone or fat.

**X-ray in standing position
is mandatory in these
cases to show bone
deformities**



Case presentation

- **Case** 43 y male diabetic 4 years non healing heel ulcer Pre operative x ray in standing position



surgical offloading by partial calcenectomy ,
debridement then vac therapy after 4 weeks



The ulcer after 4 months



Case 2 59 year old diabetic female presented with planter callus after 4th toe amputation for 2 months after 4th toe amputation done resection of metatarsal head .



Post operative Surgical offloading by metatarsal head resection



Case 3 Female diabetic patient 63 years old presented with planter ulcer after big toe amputation for 2 years ,after metatarsal head (MTH) resection.



Case 4 male patient 52y Diabetic
2 years big toe ulcer



Case 5 Female 40 years diabetic
two ulcers on planter surface



Post x ray





Case 6 metatarsal head resection

- Male 57 DM, history of 3rd toe amputation 2 years ago with callus on sole.
- 2nd metatarsal head resection was done.





case 7 Tendon Achilles lengthening



- Achilles tendon lengthening is an effective method to reduce the recurrence of plantar diabetic neuropathic ulcers of the forefoot in patients with limited ankle range of motion.



case 8 Tonotomy of flexor tendon



Surgical offloading seems a more definitive solution; however, the impaired immunity and healing power in these patients make surgery risky.

Patients should be educated regarding the importance of maintaining good glycemic control, wearing appropriate footwear, avoiding trauma, and performing frequent self-examinations.

Thanks