

Summer 20 SCHOOL 25

A residential learning experience

14-15 February 2025

Novotel Geelong, VIC

Offloading in the community

Jack Yeung – Clinical Lead Orthotics

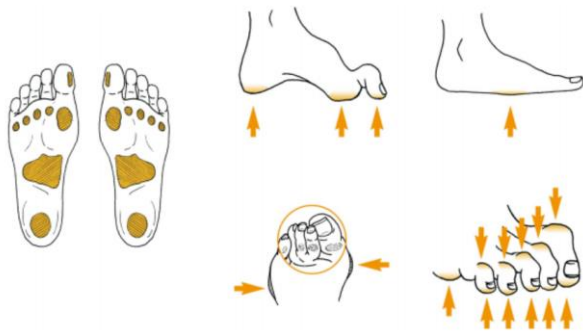
Northern Health

Plantar Pressure and offloading

Excess pressure can lead to foot ulceration

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

Areas of the foot at highest risk of ulceration



(Image sourced from Schaper, N. C., et al, 2020)



- Non-removable or Removable
- Ability to accommodate volume changes
- Short or long term
- Height (Cam walker or shoe)



Offloading = redistribute pressure to areas that are more tolerable

Appropriate offloading is key to assisting ulcers to heal

Pressure sensors

REVIEW

Open Access



Footwear and insole design features that reduce neuropathic plantar forefoot ulcer risk in people with diabetes: a systematic literature review

Sayed Ahmed^{*}, Alex Barwick, Paul Butterworth and Susan Nancarrow

Reducing plantar pressures is considered a key factor for wound healing and prevention of ulcer recurrence [31, 32]. Footwear and insoles are an essential treatment modality for offloading these pressures [33, 34]. The desired offloading threshold should be > 30% reduction in dynamic in-shoe plantar pressure from the baseline or < 200 kPa to ensure ulcer-free survival at the forefoot [35]. This systematic review aimed to summarise and evaluate the evidence for footwear and insole features that reduce pathological plantar pressures and the occurrence of diabetic neuropathy ulceration at the plantar forefoot in people with diabetic neuropathy.



< 200 kPa
> 30% reduction
from baseline



Real-Time
Pressure Readings



Pressure Mapping

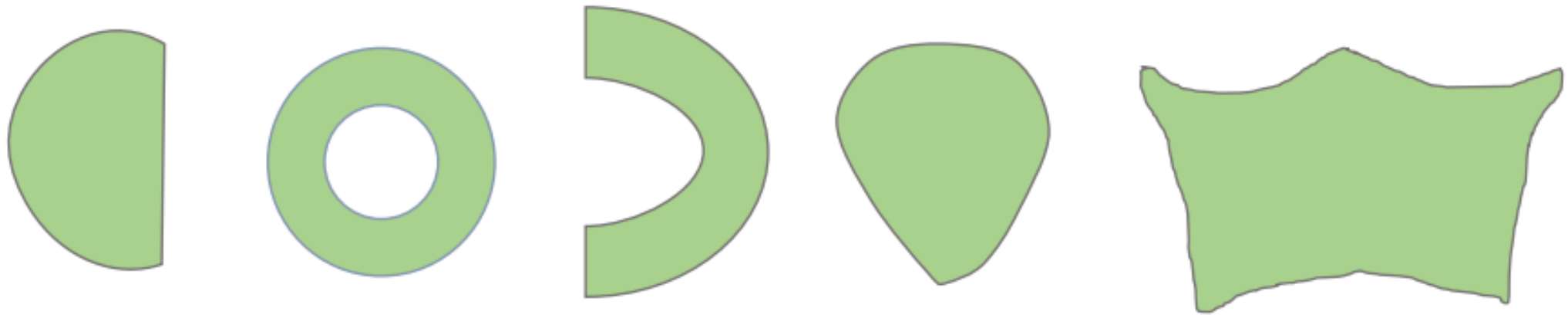


- Accurate and durable
- High resolution
- Thin (2mm) and flexible
- Don't require recalibration
- View and record live via Bluetooth

XSENSOR

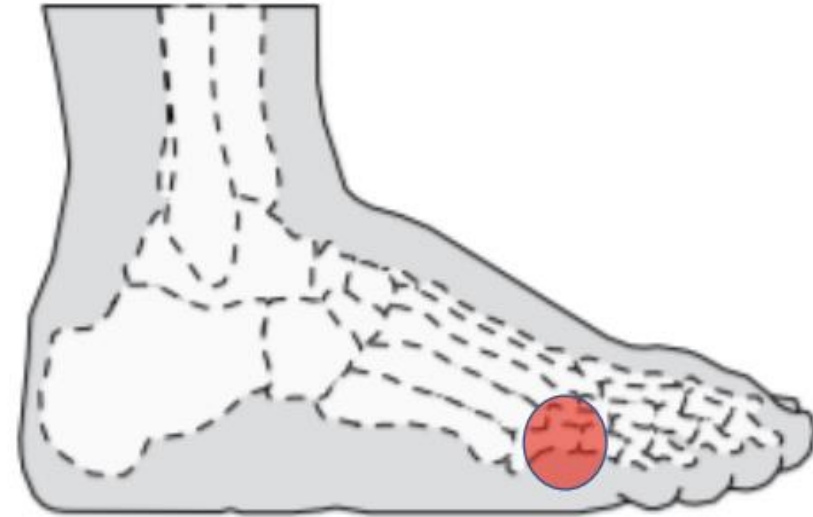
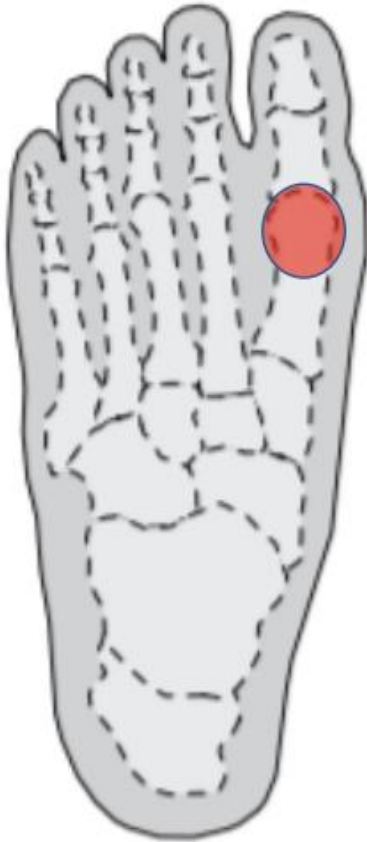


Felt padding – templates

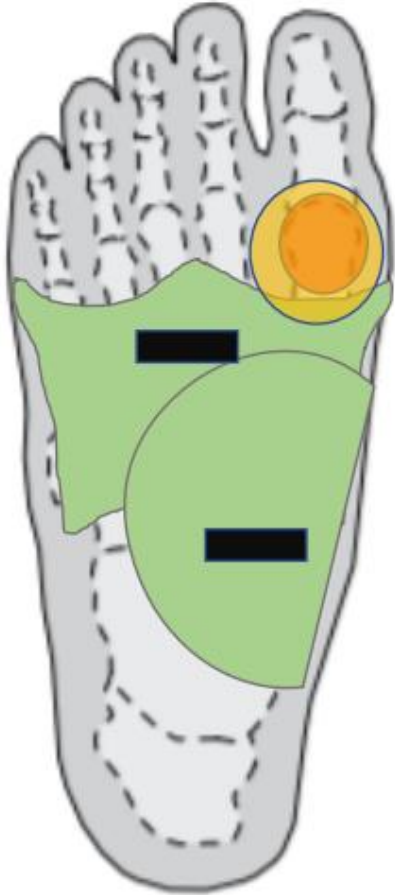


With Acknowledgements to Tim Burke, Lecturer
Latrobe University, Prosthetics and Orthotics Department

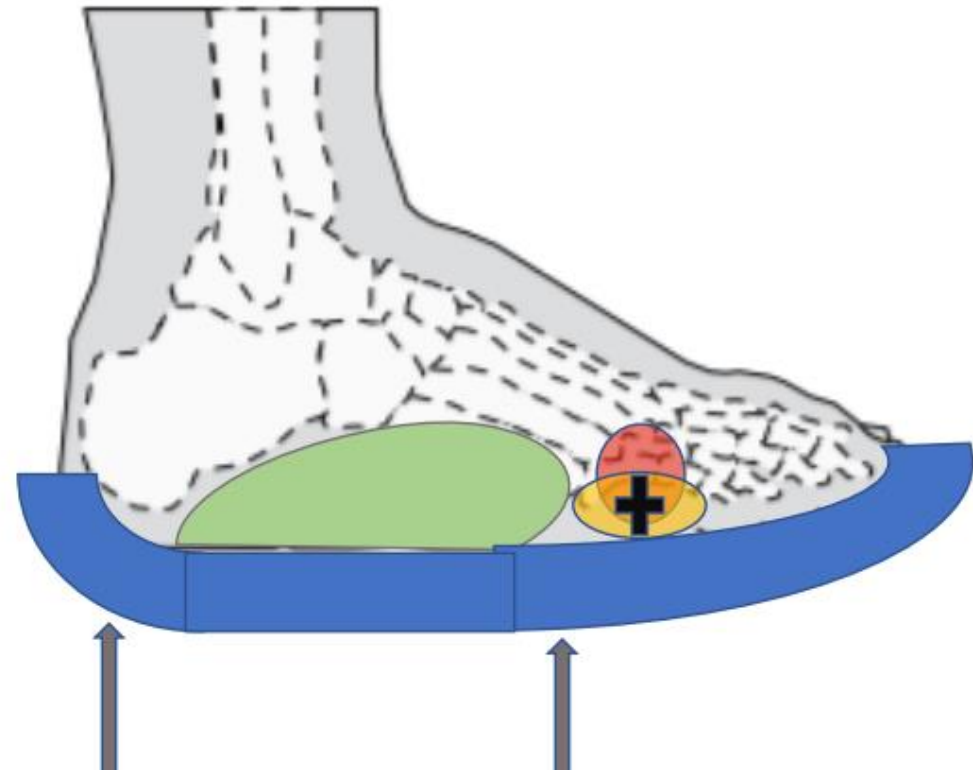
Plantar Pressure offloading strategy – 1st MTPJ



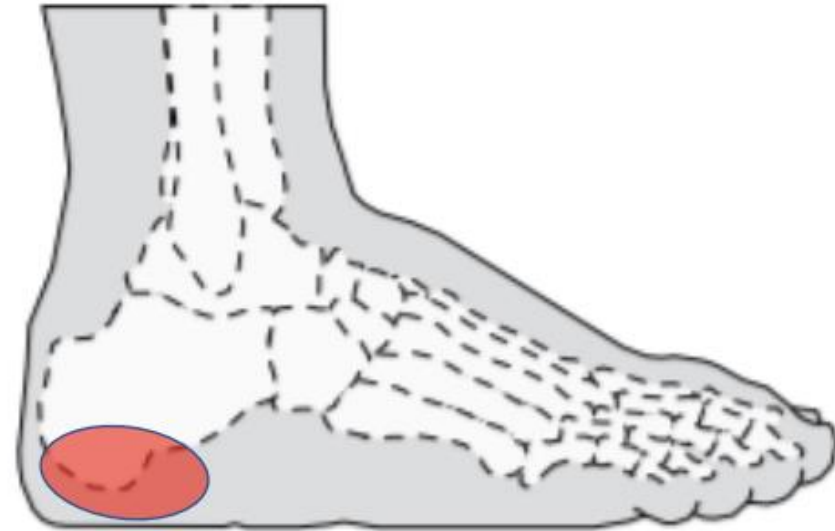
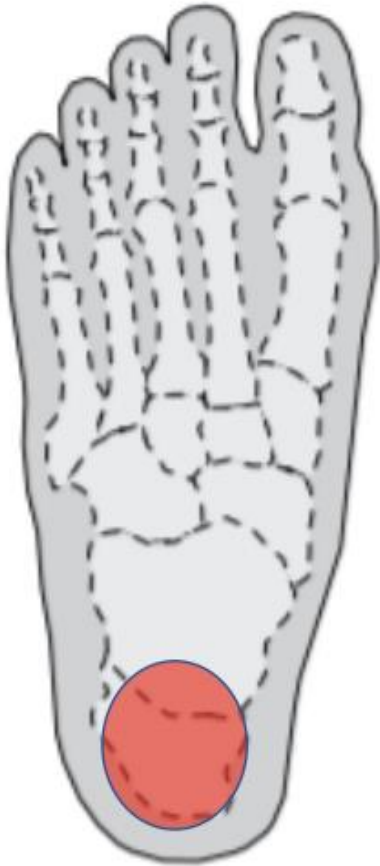
Plantar Pressure offloading strategy – 1st MTPJ



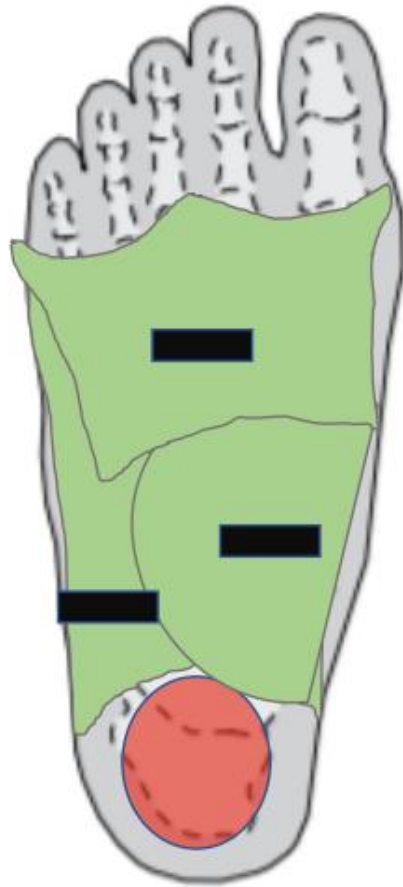
- Loading:
 - MLA
 - Met bar
- Relief:
 - Localised to wound
- Rocker:
 - Moderate entry
 - Exit from proximal to wound



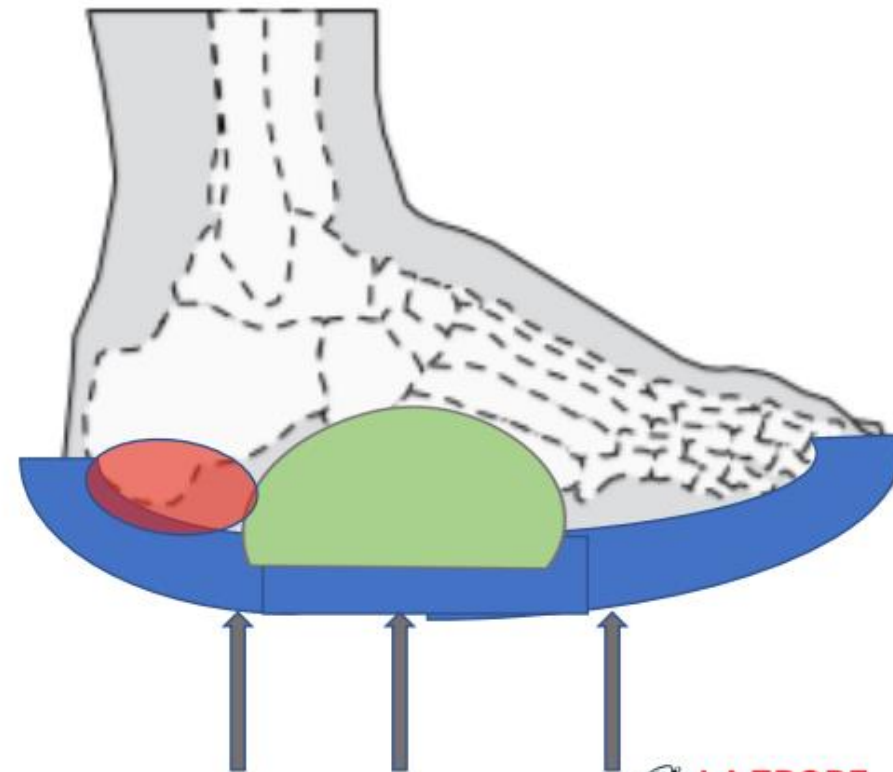
Plantar Pressure offloading strategy – plantar heel



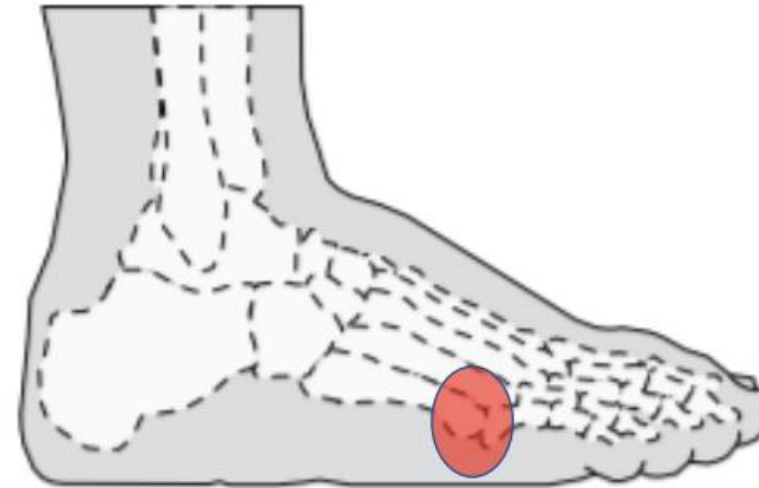
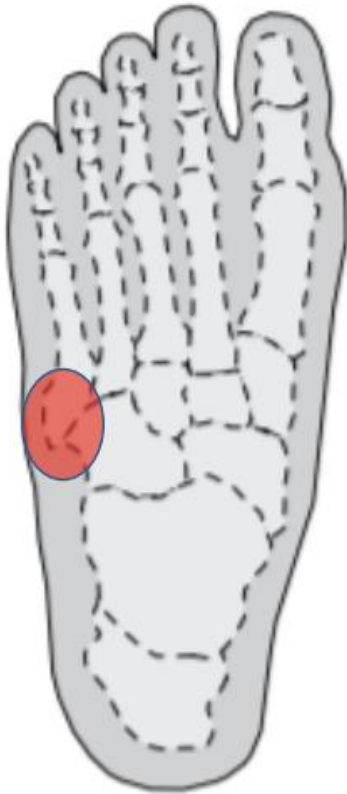
Plantar Pressure offloading strategy – plantar heel



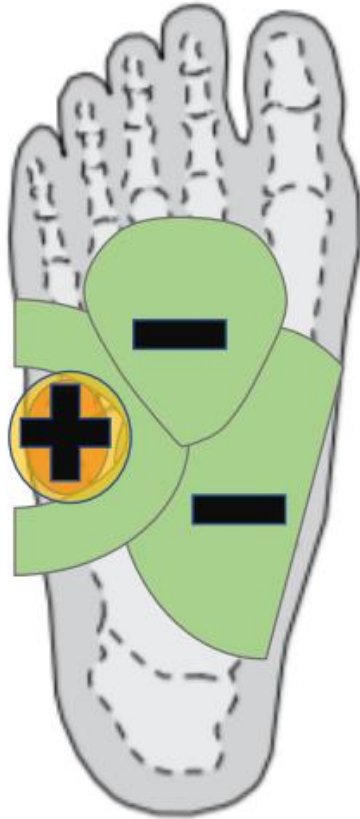
- Loading:
 - MLA
 - Met bar
 - LLA
- Relief:
 - Nil
- Rocker:
 - Steep entry to distal to wound
 - Exit from MTH
 - Midfoot 'rest' for stability



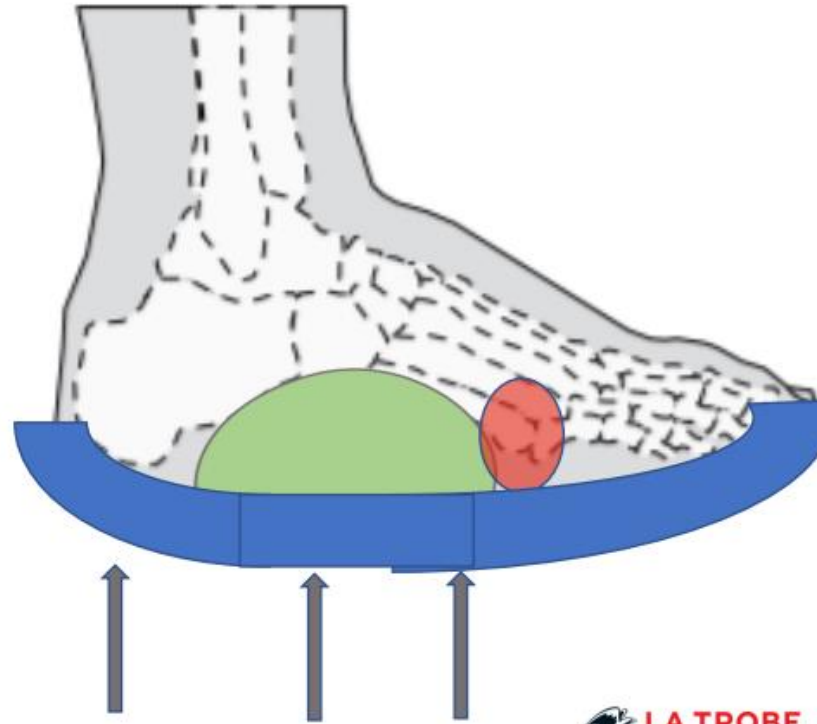
Plantar Pressure offloading strategy – 5th MTPJ



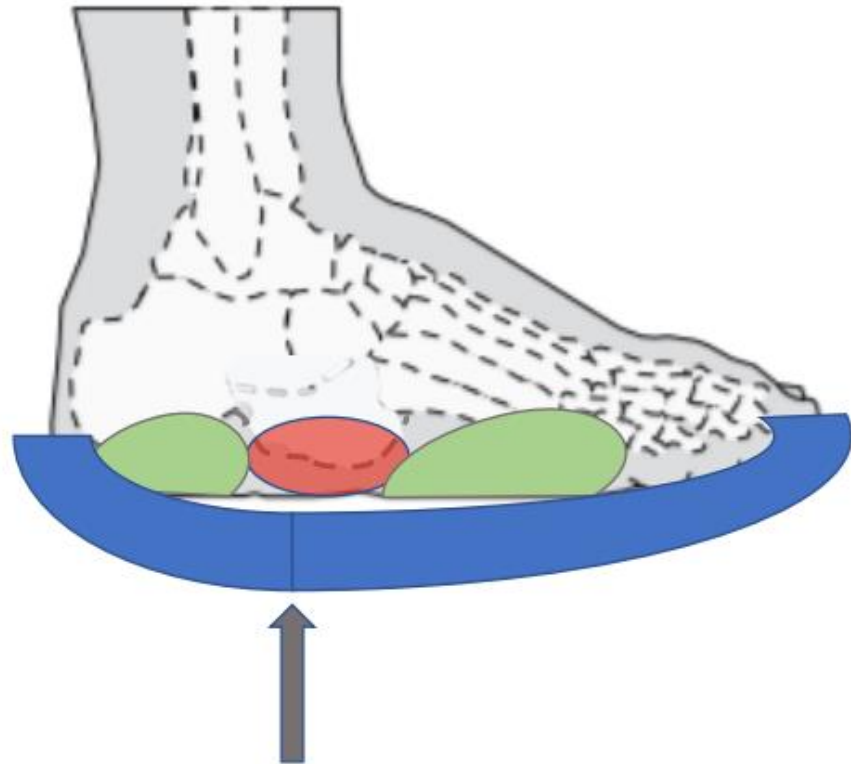
Plantar Pressure offloading strategy – 5th MTPJ



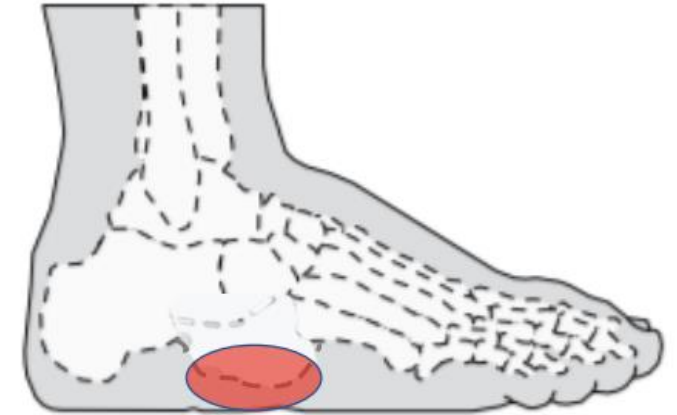
- Loading:
 - MLA
 - Met dome
 - Horse shoe
- Relief:
 - Localised to wound
- Rocker:
 - Moderate entry
 - Midfoot 'rest' for stability
 - Exit from proximal to wound



Plantar Pressure offloading strategy – midfoot



- Loading:
 - Calcaneus
 - Met dome
- Relief:
 - Localised to wound*
- Rocker:
 - Moderate entry to mid wound
 - Exit from mid wound
 - Nil 'rest', this creates an unstable stance/gait



Offloading shoe – rocker sole profile

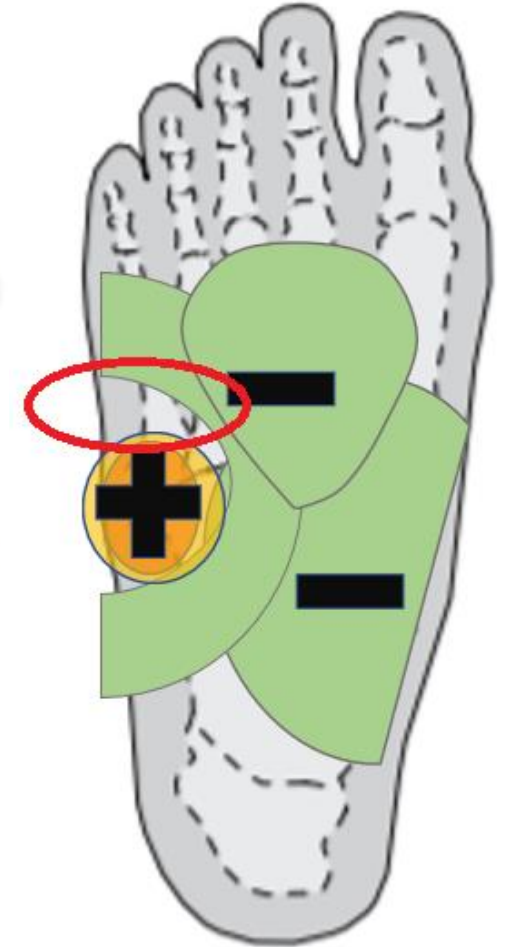


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Tips and tricks

- Felt padding – consider your patient slide forward at initial contact and loading response
- Rolling out laterally:
 - Use wedges with donut relief
 - Use wedges as provide firmer heel counter
- Velcro straps too short after 20mm felt:
 - Use Velcro extensions
 - [Easystrap Hook Loop | OPC Health](#)



Individual client considerations

- Neuropathy – higher risk of falls due to effect on balance, coordination and gait
- Offloading modality can result in greater instability
- Consider contralateral limb and use of even up
- Time and material requirements
- Skill level of clinicians
- Ability to don/doff orthosis
- Client preference, mobility and activity level



Offloading – suspected Charcot



ÖSSUR.



OPC
OPC HEALTH



enovis.




AWSA
AUSTRALIAN WOUND & SKIN ALLIANCE

Short vs tall

IWGDF Offloading Guideline



WHAT'S NEW

We have made several changes in this updated 2023 offloading guideline when compared to the previous 2019 offloading guideline. The main changes are the following:

- Removable knee-high and ankle-high offloading devices are now grouped into one recommendation for second-choice offloading device treatment, rather than separate recommendations for second and third-choice treatment, respectively, effectively upgrading ankle-high offloading devices. This is based on added evidence in the last 4 years and the more thorough GRADE approach used.

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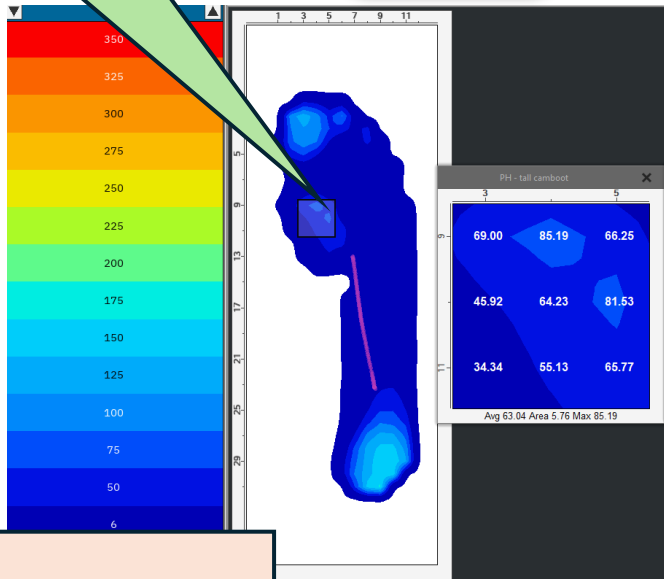
- Added four new recommendations for specific surgical offloading interventions rather than grouping surgical interventions into one recommendation.
- Added a new recommendation on offloading for the contralateral limb.
- Updated the strength of recommendation in two recommendations and the certainty of evidence in nine recommendations based on using the more thorough GRADE approach.



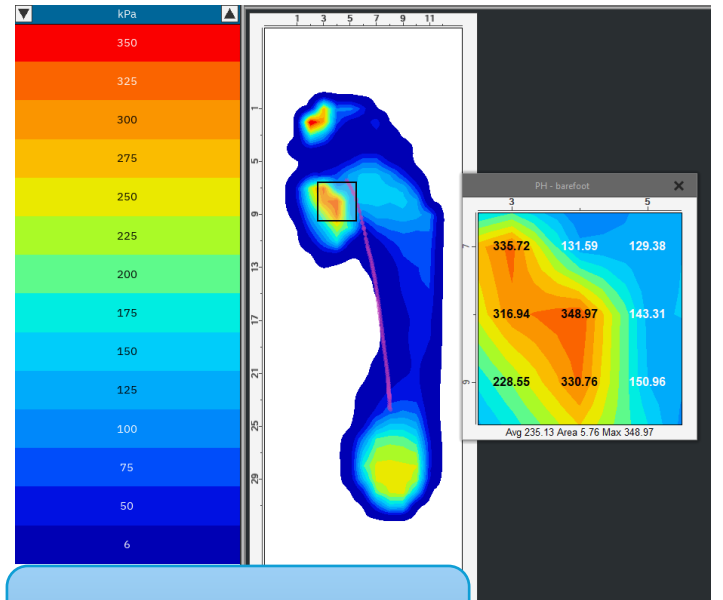
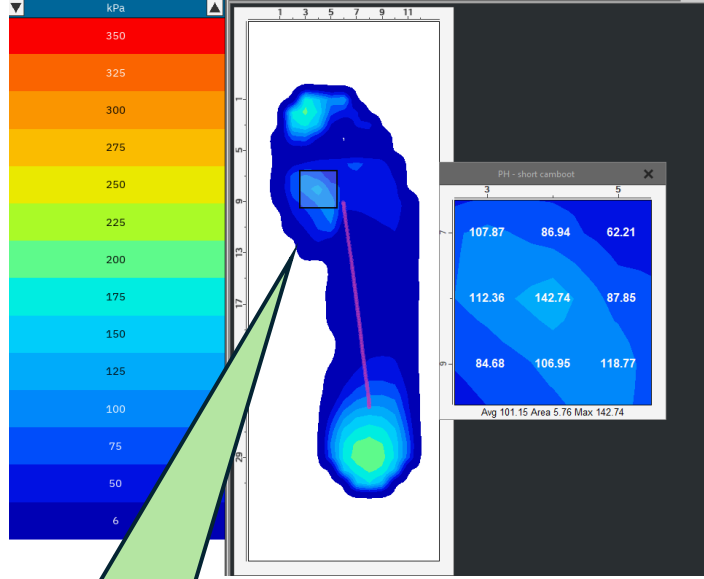
Tall vs Short



63 kPa
82% reduction



124 kPa
59% reduction



Peak: 349 kPa

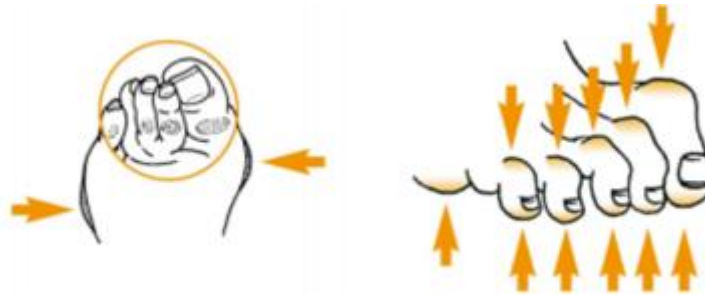
< 200 kPa
> 30% reduction
from baseline

Toe pressure

Accommodate



Gordon X-depth (M/W/XW)



Causes:

- Biomechanics
- Muscle imbalance
- Neurological conditions
- Shoes too tight
- Broken toe
- Cross over toe

Offload



Posterior heel pressure

Fitting tips:

- Ensure heel is sitting in the aperture for optimal offloading
- Firm straps
- **For bed use only**



Heelift suspension boot



Maxxcare Heel Pro Evolution



Prevalon heel protector



Reference

- Ahmed, S., Barwick A., Butterworth, P., Nancarrow, S. (2020). Footwear and insole design features that reduce neuropathic plantar forefoot ulcer risk in people with diabetes: a systematic literature review. *Journal of Foot and Ankle Research*, 13(1).
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IWGDF (2023). IWGDF guidelines on the prevention and management of diabetic foot disease. Retrieved from: [Guidelines \(2023 update\) - IWGDF Guidelines](#)

With Special acknowledgement to:

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