Evaluation of Diabetic Foot Ulcer

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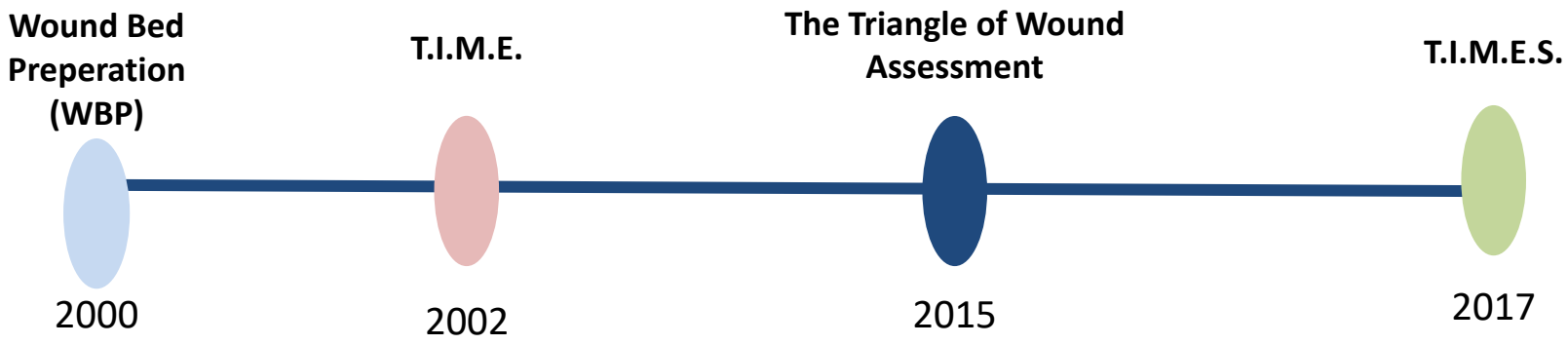
Outlines

- wound assessment frameworks
- Assessment of diabetic foot ulcers
- Triangle of Accurate and Timely Wound Assessment

Development of wound assessment frameworks



TIMES MODEL
of wound bed preparation

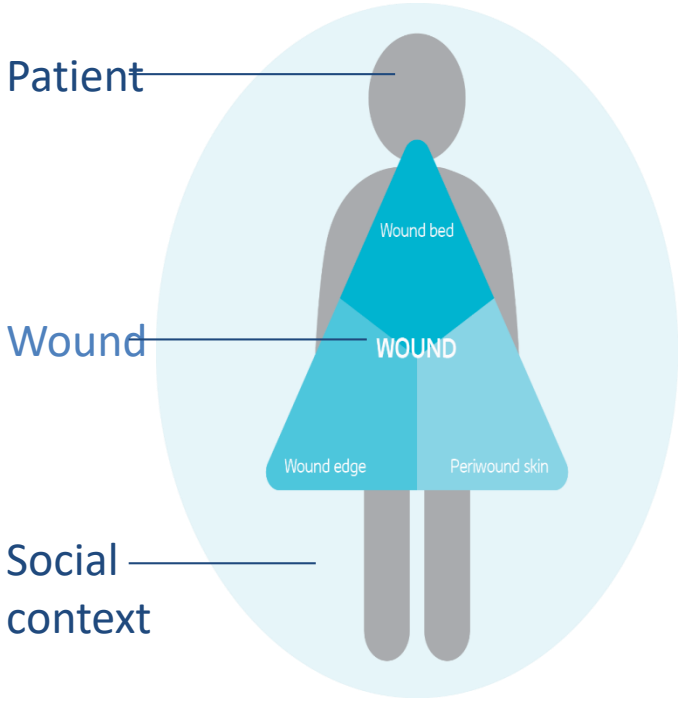
Wounds UK

The Triangle of Wound Assessment

A simple and holistic framework for wound management

A **systematic** approach

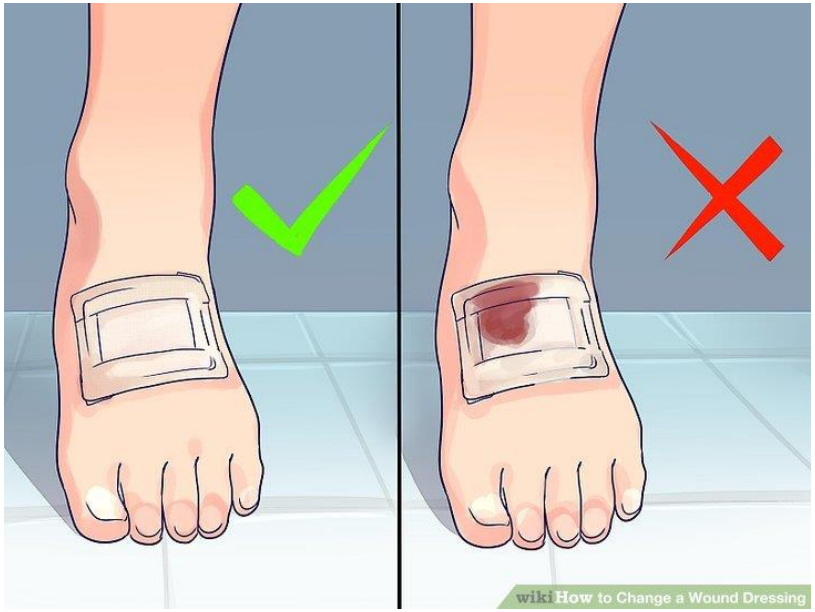
A **holistic** framework



Assessment of diabetic foot ulcers

- **Gate and footwear**

- **DFU change dressing**



Bus, S. A., et al. "IWGDF Guidance on the prevention of foot ulcers in at-risk patients with diabetes." *Diabetes/metabolism research and reviews* (2015)

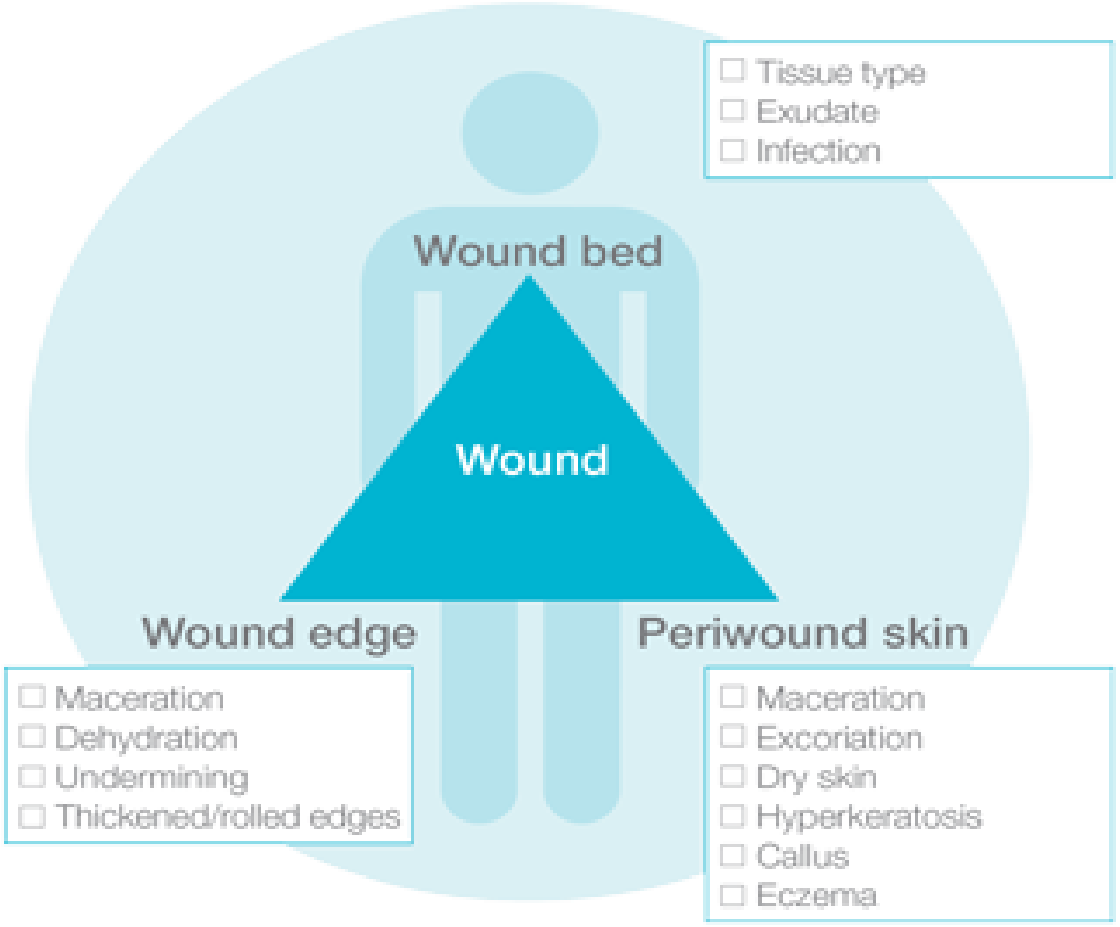
Types of Diabetic Foot Ulcers

- **Neuropathic DFU**
  - Motor
  - Sensory
  - Autonomic
- **Ischaemic DFU**
- **Neuroischemic DFU**

Feature
Sensation
Callus/necrosis
Wound bed
Foot temperature and pulses
Other
Typical location

Armstrong DG, Cohen K, Courric S, et al. Diabetic foot ulcers and vascular insufficiency. *J Diabetes Sci Technol 2011; 5(6): 1591-95.*

Triangle of Accurate and Timely Wound Assessment



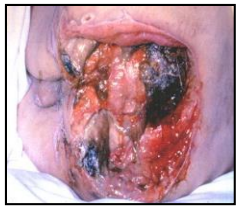
www.wuwhs2016.com/files/WUWHS_TWA_FINAL_web.pdf

Wound Bed Management

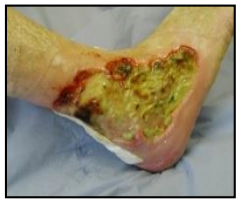
- **Type of Tissue**
- **Exudate**
- **Infection**

Wound Bed Management: Type of Tissue

Assessment	Management Goals	Treatment



Necrotic



Sloughy

Remove non-viable tissue

Debridement

Black	Necrotic Tissue
Yellow	Sloughy Tissue

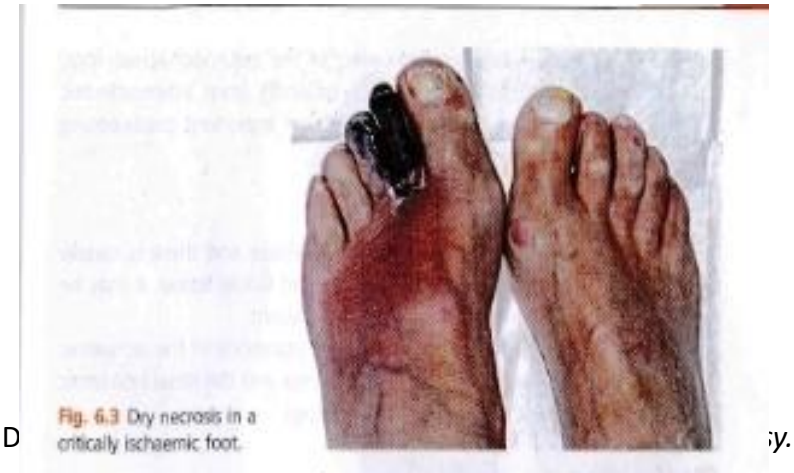


Fig. 6.3 Dry necrosis in a critically ischaemic foot.

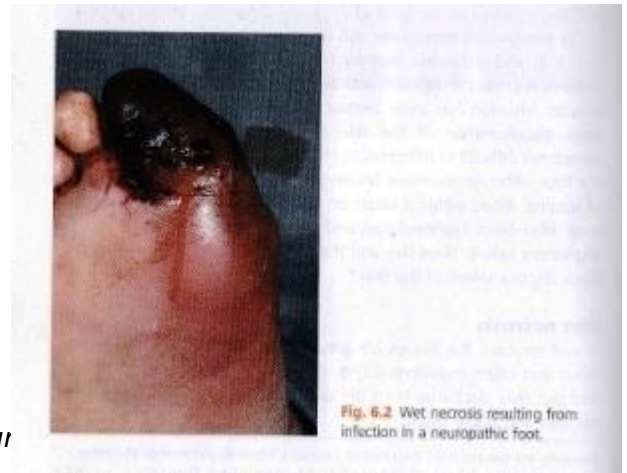
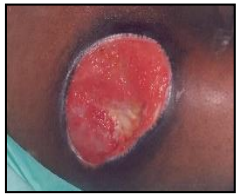


Fig. 6.2 Wet necrosis resulting from infection in a neuropathic foot.

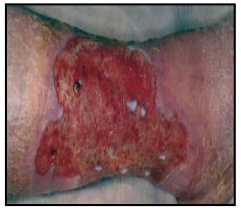
D … *y. Wour*

Wound Bed Management: Type of Tissue

Assessment | Management Goals | Treatment



Granulating



Epitheliasing

Protect granulation/ epithelial tissue

Hydrocolloid

Red	Granulation Tissue
Pink	Epithelial Tissue

Dowsett et al. *The Triangle of Wound Assessment Made Easy. Wounds International. May 2015*

Wound Bed Management: Exudate

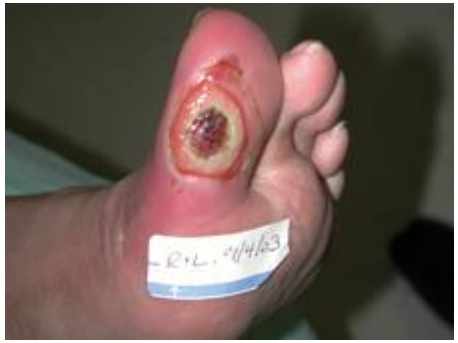
Assessment	Management Goals	Treatment
Level		
☐ Dry	*Rehydrate wound bed*	**Hydrogel**
☐ Low ☐ Medium ☐ High	*Manage exudate*	**Appropriate dressing for exudate level (e.g. hydrocolloid for low, foam for high)**

Dowsett et al. *The Triangle of Wound Assessment Made Easy. Wounds International. May 2015*

Wound Bed Management: Infection

Assessment | Management Goals | Treatment

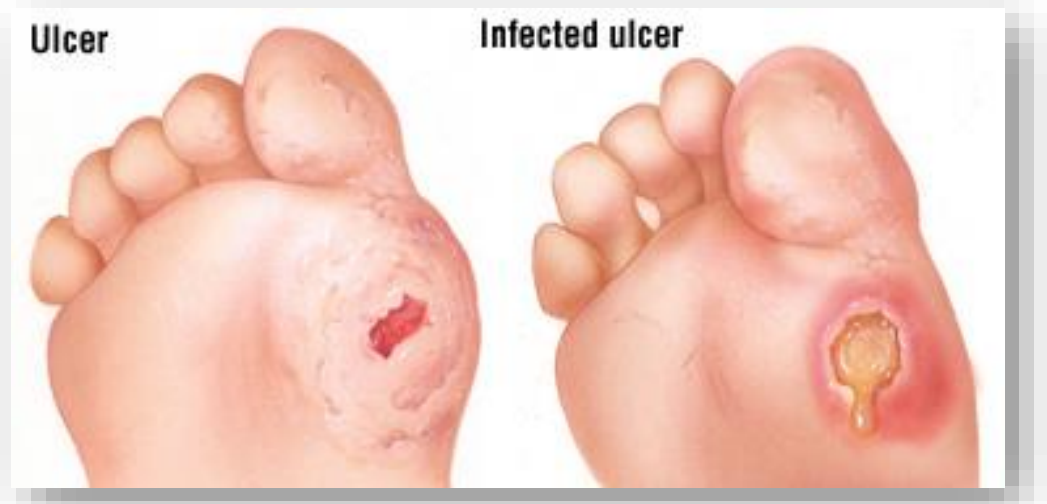
Sign of infection



- Wound exudate
- Wound odour

Manage bacterial burden

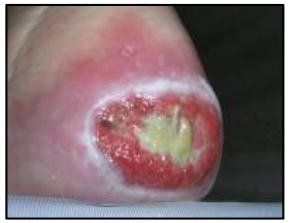
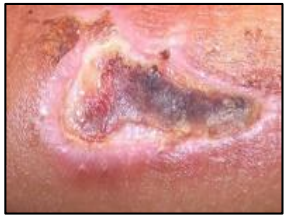
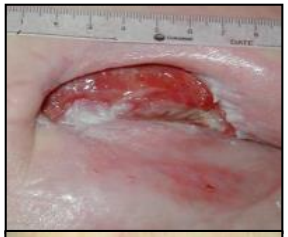
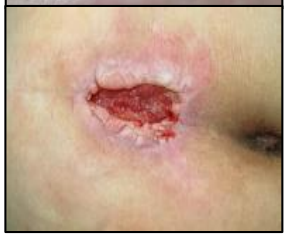
Antimicrobial



Dowsett et al. *The Triangle of Wound Assessment Made Easy. Wounds International. May 2015*

Wound Edge Management

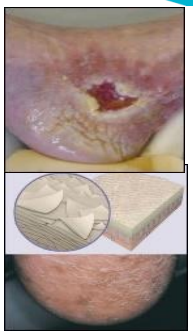
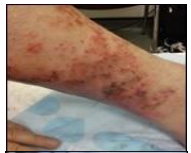
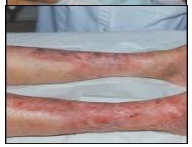
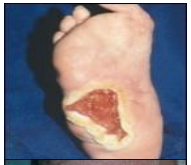
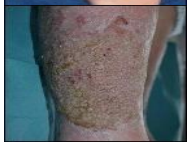
Wound Edge Management

Assessment	Management Goals	Treatment
 Maceration	*Manage exudate*	Appropriate dressing for exudate level (e.g. hydrocolloid for low, foam for high)
 Dehydration	*Rehydrate wound edge*	Barrier cream
 Undermining  Rolled edges	*Remove non-viable tissue + Protect granulation/ epithelial tissue*	Debridement + Hydrocolloid

Dowsett et al. *The Triangle of Wound Assessment Made Easy. Wounds International. May 2015*

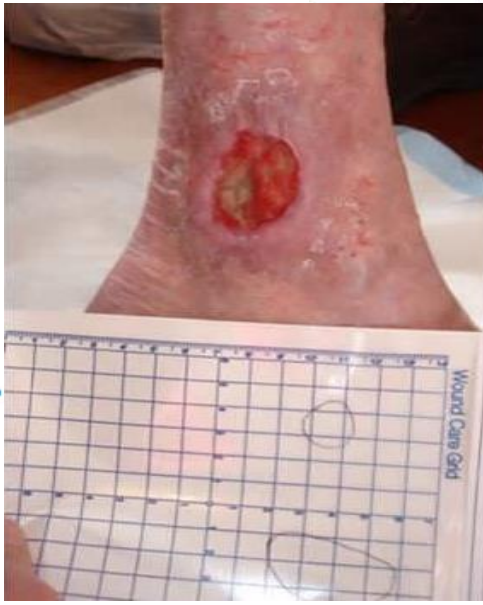
Periwound Skin Management

Periwound Skin Management

Assessment	Management Goals	Treatment
 Maceration	*Manage exudate*	Appropriate dressing for exudate level (e.g. hydrocolloid for low, foam for high)
Dry skin	*Rehydrate skin*	Barrier cream
 Excoriation	*Protect skin*	Barrier film
 Eczema		
 Callus	*Remove non-viable tissue*	Debridement
 Hyperkeratosis		

Dowsett et al. *The Triangle of Wound Assessment Made Easy. Wounds International. May 2015*

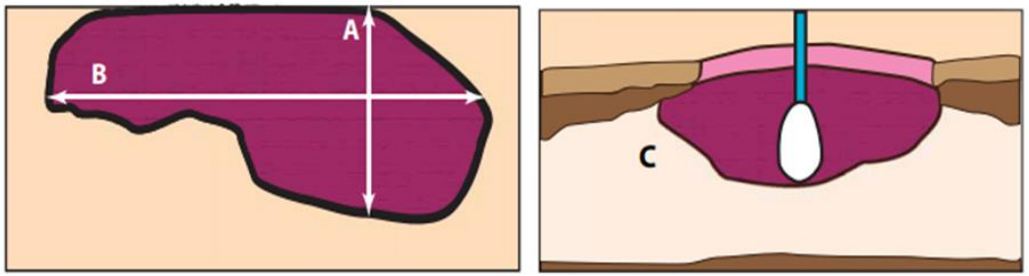
Baseline and Serial Measurement of Wound Size



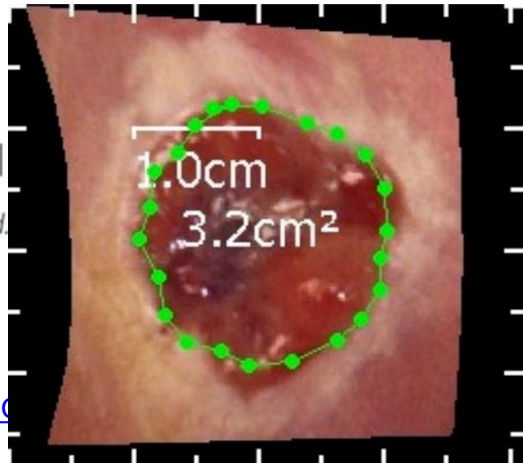
Wound Measurement & Documentation Guide

Measuring Wounds

Measure the length "head-to-toe" at the longest point (A). Measure the width side-to-side at the widest point (B) that is perpendicular to the length, forming a "+". Measure the depth (C) at the deepest point of the wound.
All measures should be in centimeters.



This ruler is intended for use as a reference only. To prevent infection, do not use this ruler to measure an actual wound.



http://www.hqi.solutions/wp-content/uploads/2017/05/Nurs_Wound-Measurement-Documentation-G

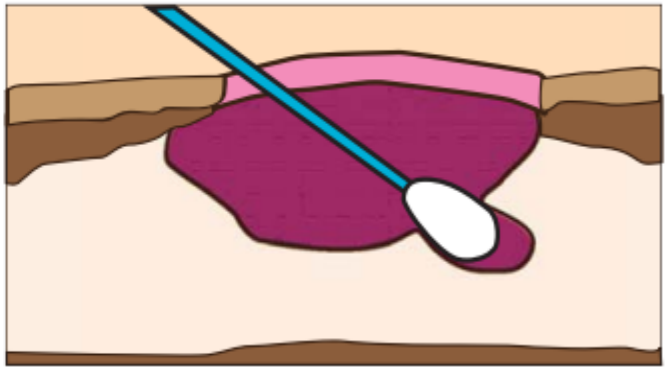
Measurement of Wound Size…

Using a clock format, describe the location and extent of tunneling (sinus tract) and/or undermining.

The head of the patient is 12:00, the patient's foot is 6:00.

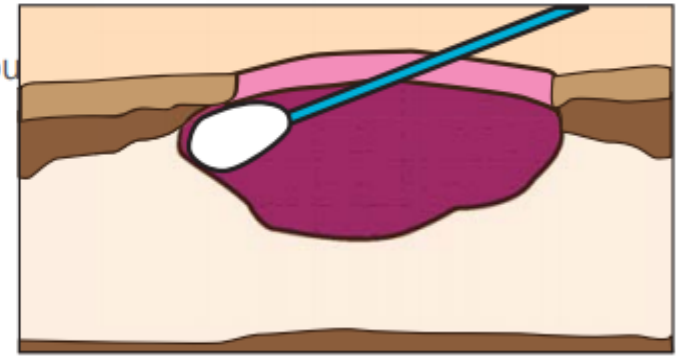
Tunneling/Sinus Tract

A narrow channel or passage-way extending in any direction from the base of the wound. This results in dead space with a potential risk for abscess formation.



Undermining

Open area extending under intact skin along the edge of the wou



http://www.hqi.solutions/wp-content/uploads/2017/05/Nurs_Wound-Measurement-Documentation-Guide_092016_final.pdf

Assessment of DFU...

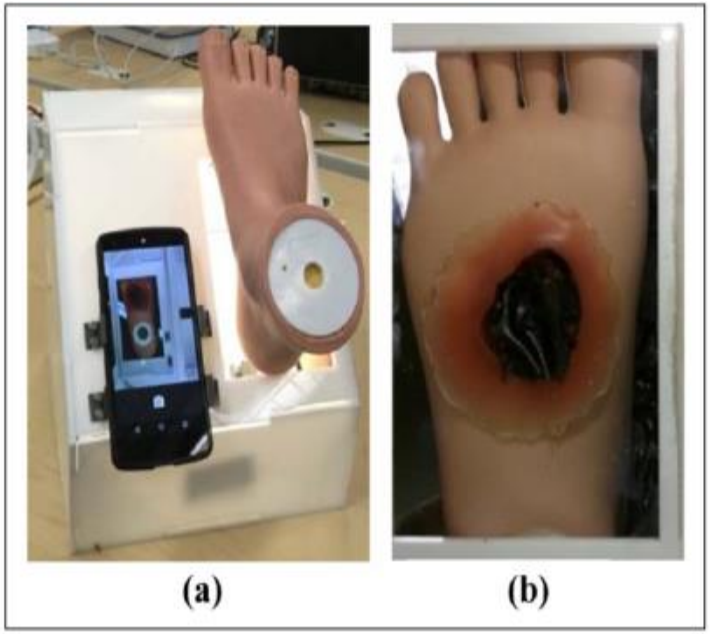


Figure 2. Image capture box: (a) the image capture box with smartphone and foot model; (b) wound image captured using the warm LED light.

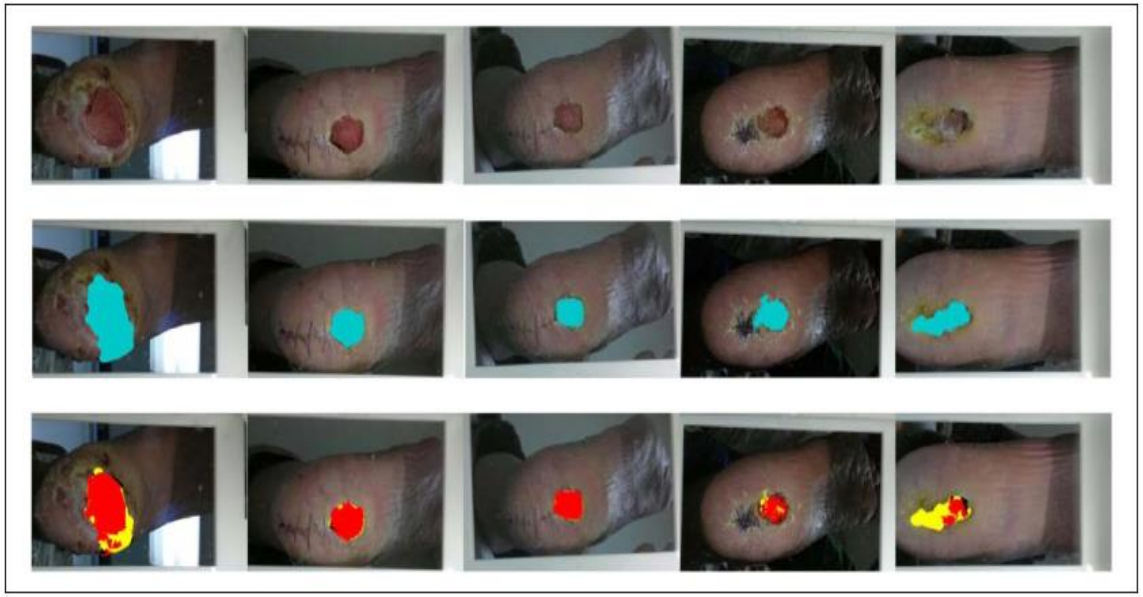
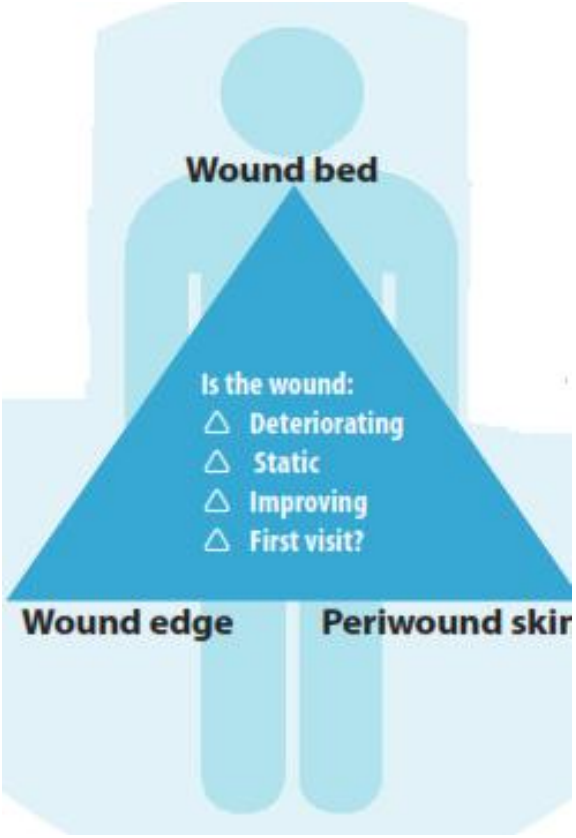


Figure 4. Wound area and tissue classification results for patient 1. Row 1: original foot ulcer images; row 2: wound boundary determination results; row 3: tissue classification results.

Wang, Lei, et al. "An Automatic Assessment System of Diabetic Foot Ulcers Based on Wound Area Determination, Color Segmentation, and Healing Score Evaluation." *Journal of diabetes science and technology* 10.2 (**2016**): 421-428.

Take home message

- **Making the link from Assessment to Treatment**



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