

# High Resolution Ultrasound

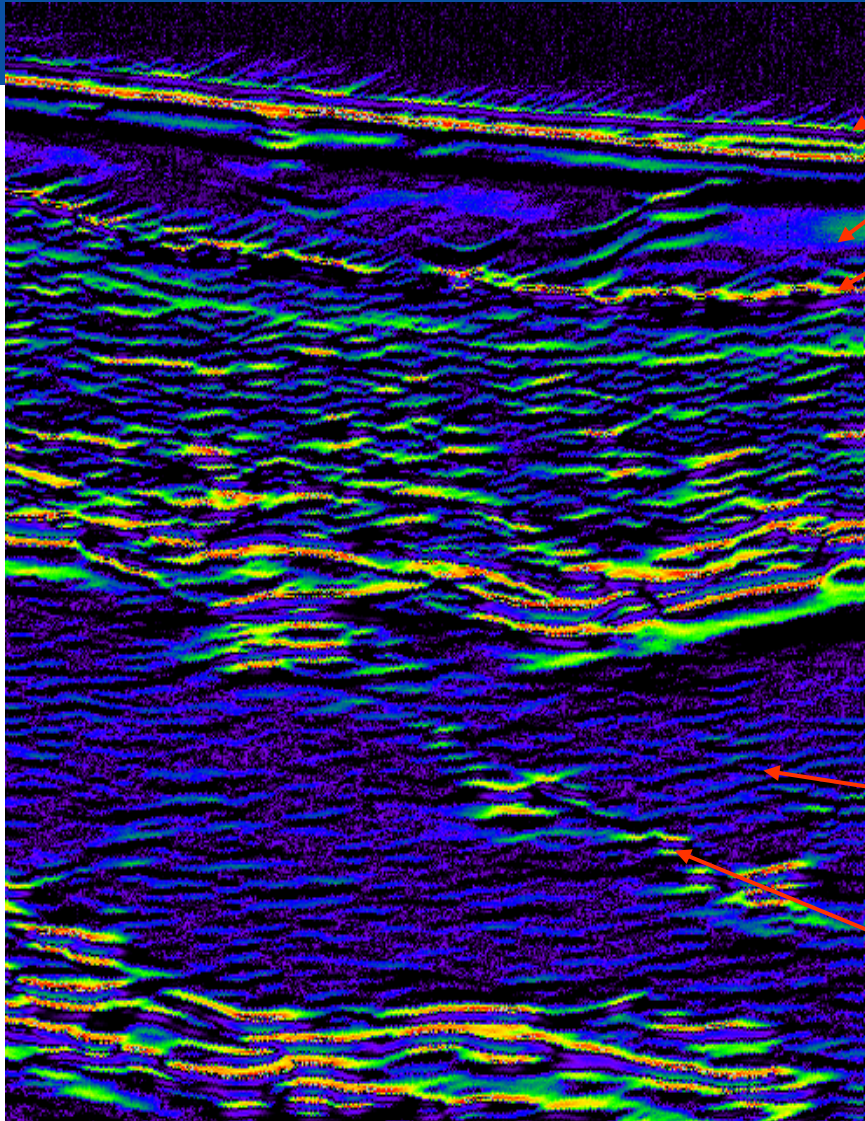
## Detection, Prevention and Management of Pressure Ulcers

# Incidence

10% of of patients in acute and extended stay facilities in the western world develop pressure ulcers.

Annual cost ~\$7billion

# Normal Skin



Reflections from probe membrane

Coupling gel

Stratum corneum of epidermis

Living strata of epidermis

Reflections from acoustic interfaces  
(e.g. between collagen & hydrated  
ground substance) in papillary layer  
of dermis

Reflections from acoustic interfaces  
in reticular layer of dermis

Hypodermis (panniculus adiposus)

Reflections from collagen & ground  
substance interfaces within fibrous  
supports of adipose tissue

# LONGPORT High Frequency Ultrasound Scanner

## Advantages

- Objective Assessment for
  - Early and reliable detection of developing pressure ulcers
  - Improved monitoring of existing wounds
  - Risk-based and cost-effective treatments
- Objective Documentation for
  - Advanced record keeping
  - Improved staff awareness
  - Reduce exposure to litigation and sanctions

# LONGPORT High Frequency Ultrasound Scanner

- Early and reliable detection of developing pressure ulcers

Image tissue changes that precede visible changes regardless of skin pigmentation

# Pathogenesis

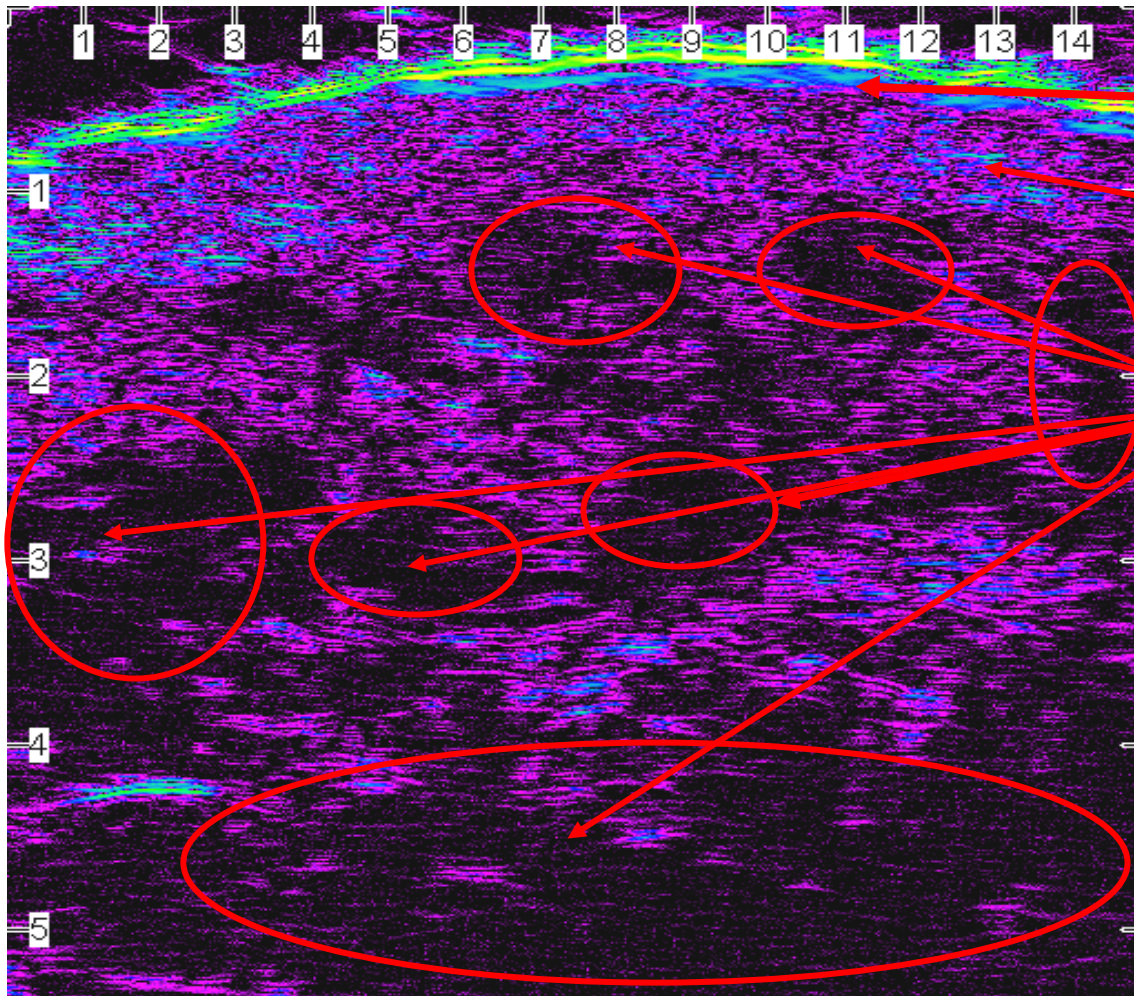
“Pressure ulcers appear to begin in the subcutaneous tissue between the skin and bone as pockets of edema, indicated ultrasonically by pockets of weak reflections and progress by direct extension into dermal tissue”

*Paul Quintavalle, DPM*

*Director*

*Virtua Wound Care Center*

# Pre-Pressure Ulcer tissue changes.



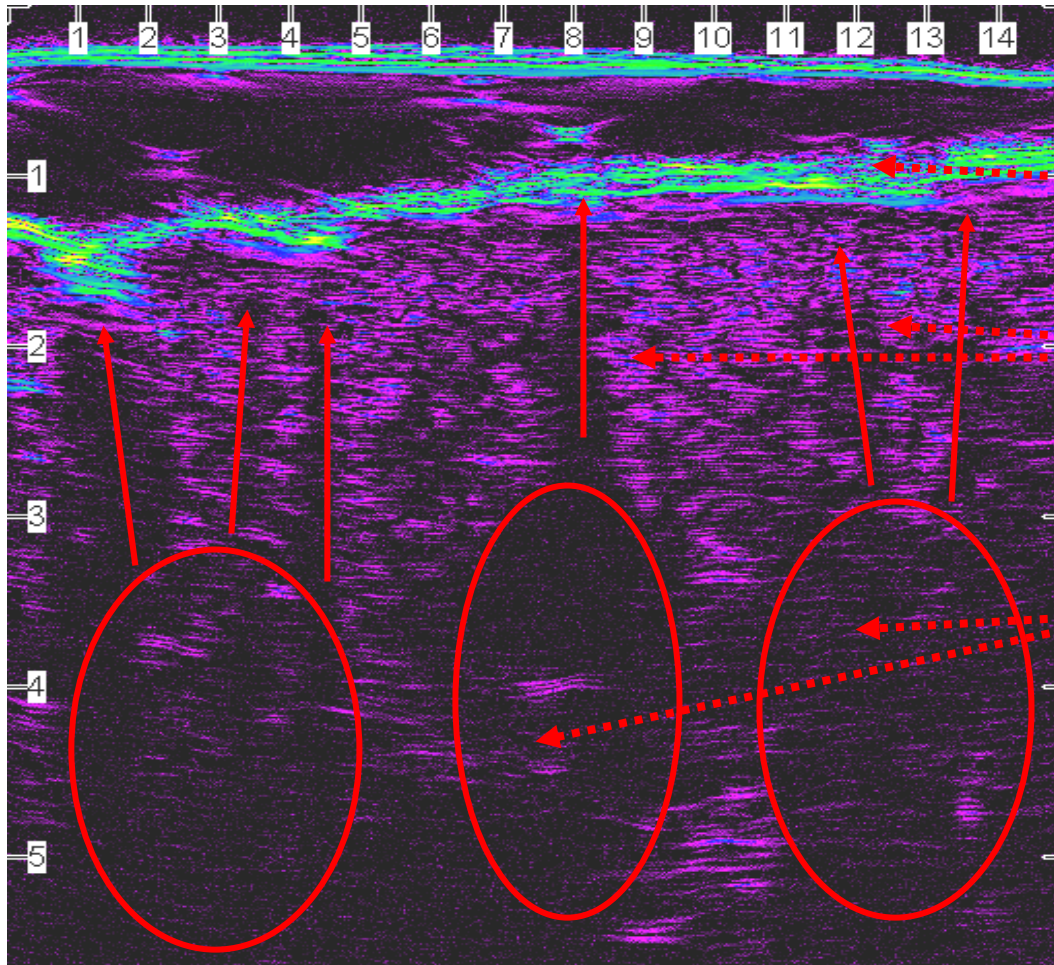
Intact Epidermis

Normal Dermis

Pockets of subcutaneous inflammation



# Pre-Pressure Ulcer tissue changes



Intact Epidermis

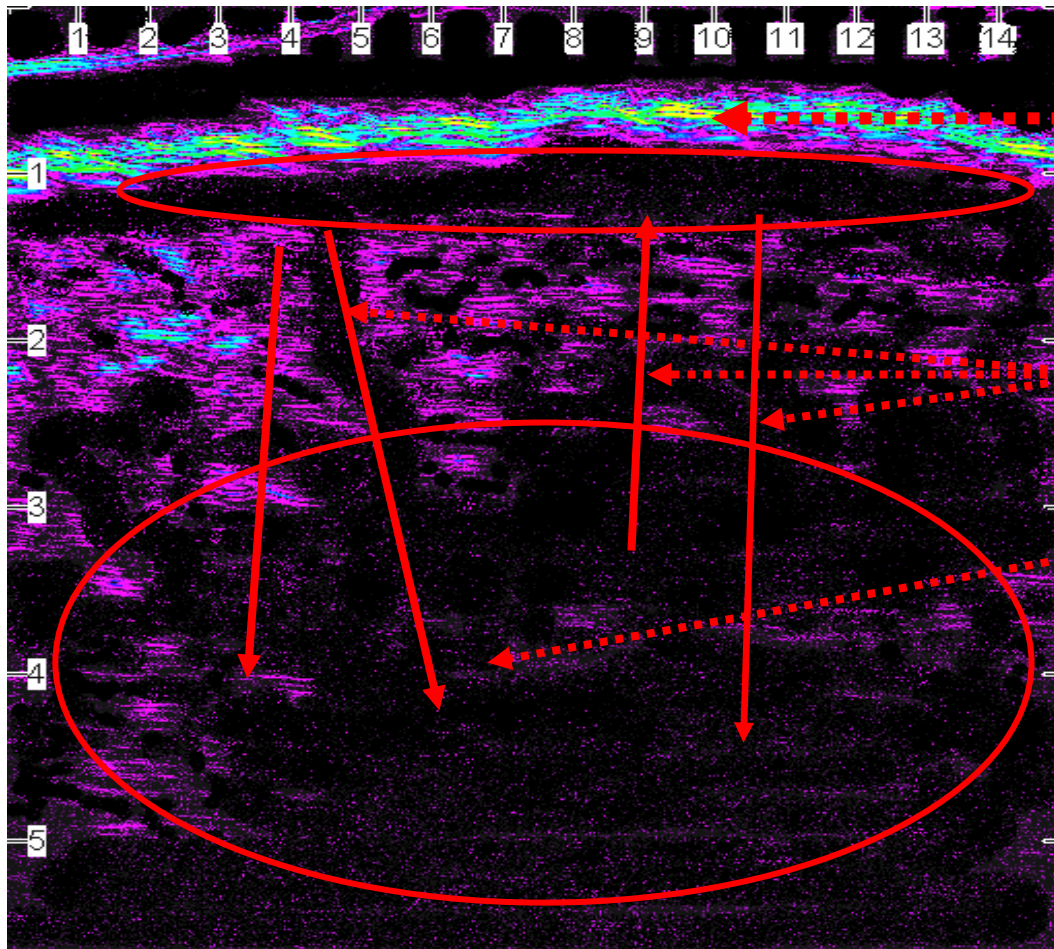
Strips of dermal damage

Increased subcutaneous damage



\* Note the progression of fluid into the dermis

# Pre-Pressure Ulcer Tissue Injury.



Intact Epidermis

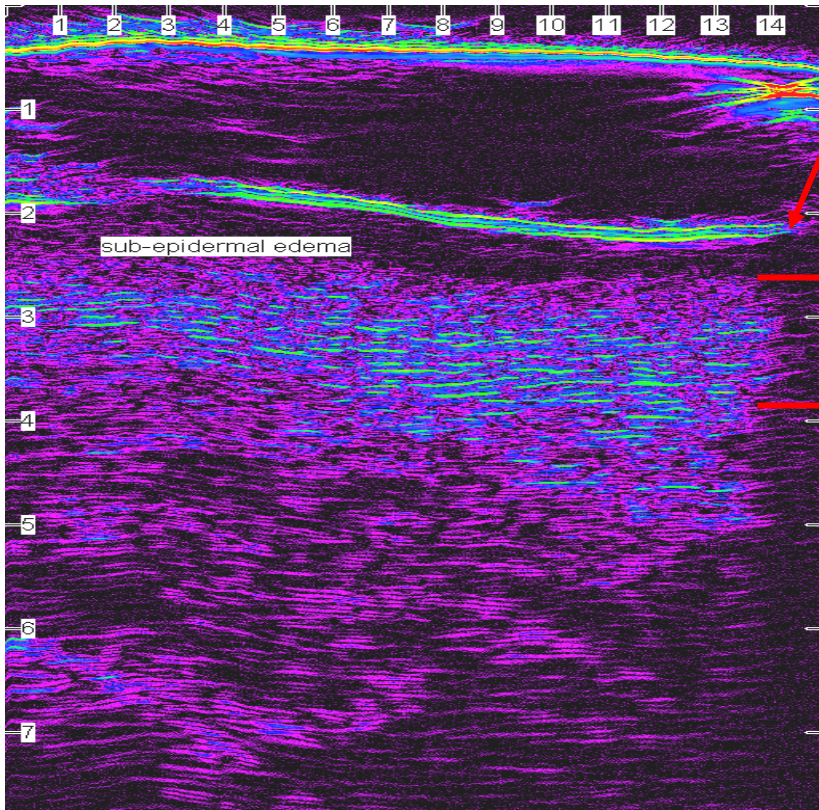
Strips of dermal damage

Increased subcutaneous damage



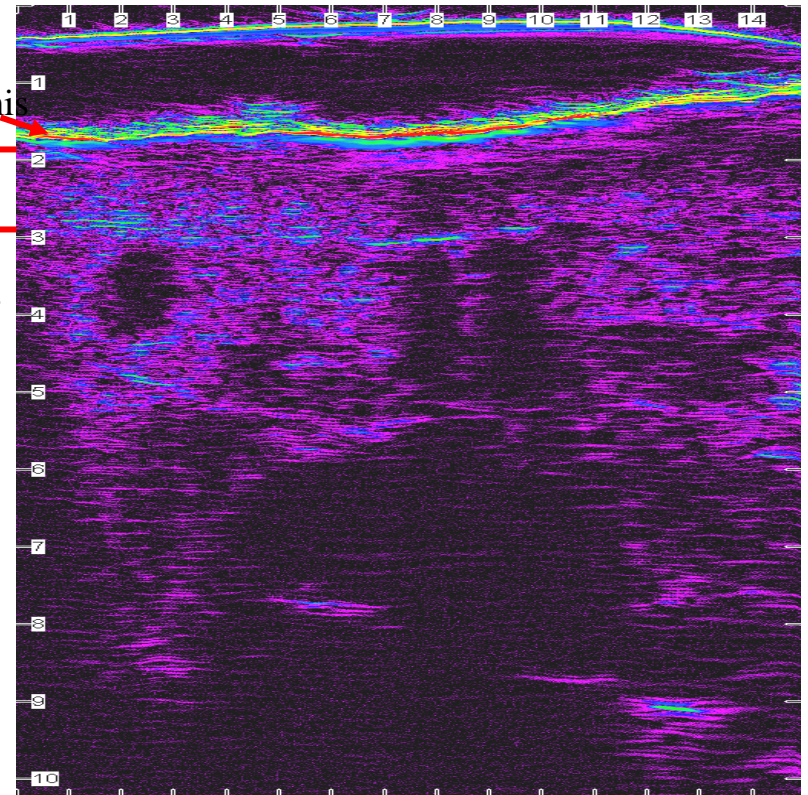
\* Note the collection of fluid directly below intact dermis

# Differentiate Pressure Ulcer from Friction or Incontinence Related Breakdown



Superficial Edema

Friction



Deep Edema

Pressure

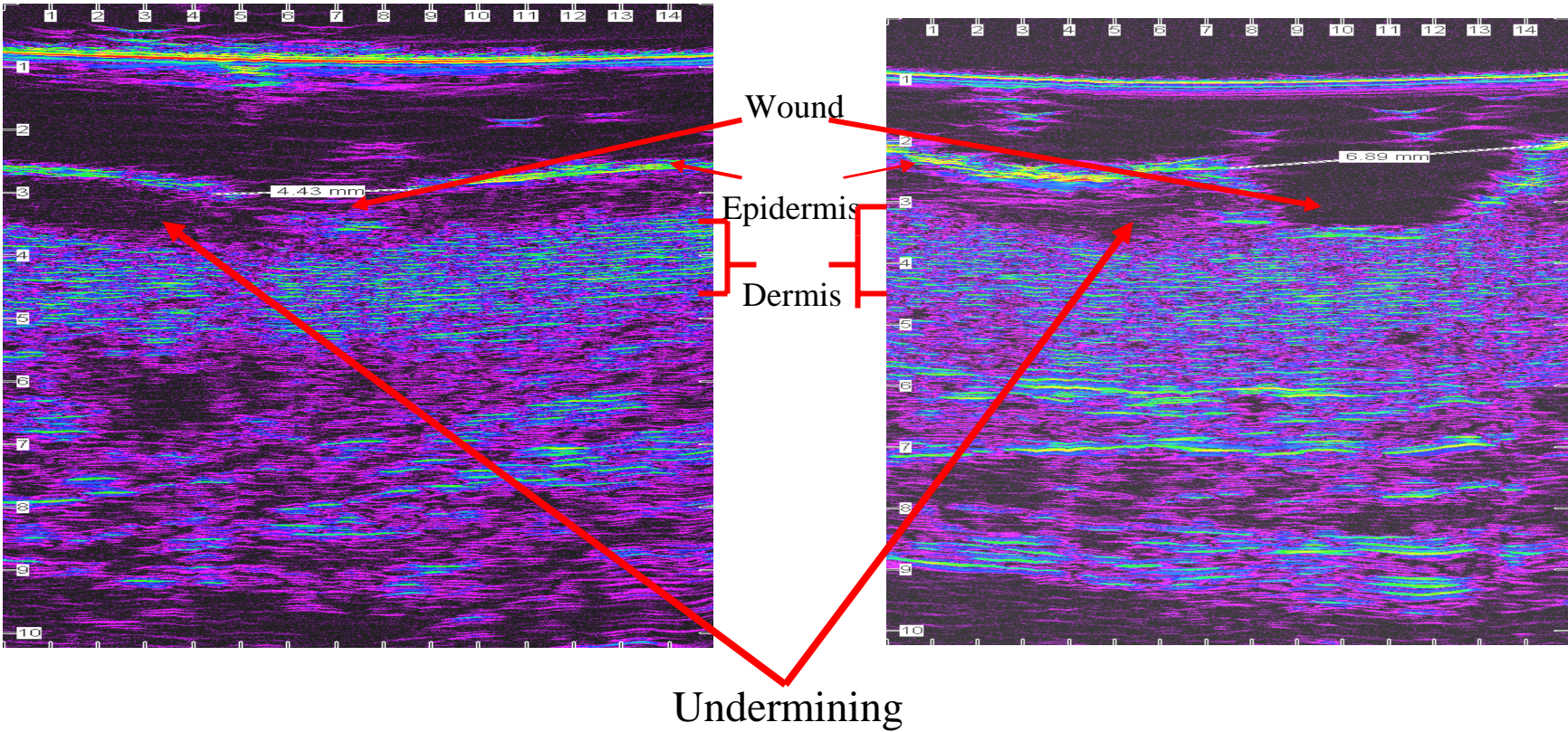
# LONGPORT High Frequency Ultrasound Scanner

## **Improved monitoring of existing wounds**

“ Up until now, nurses have been limited to a two-dimensional picture and the presence of exudate for assessing a wound. With this scanner we can see if healing has taken place in deeper tissue and not just on the surface. This device takes the guess work out of wound treatment.”

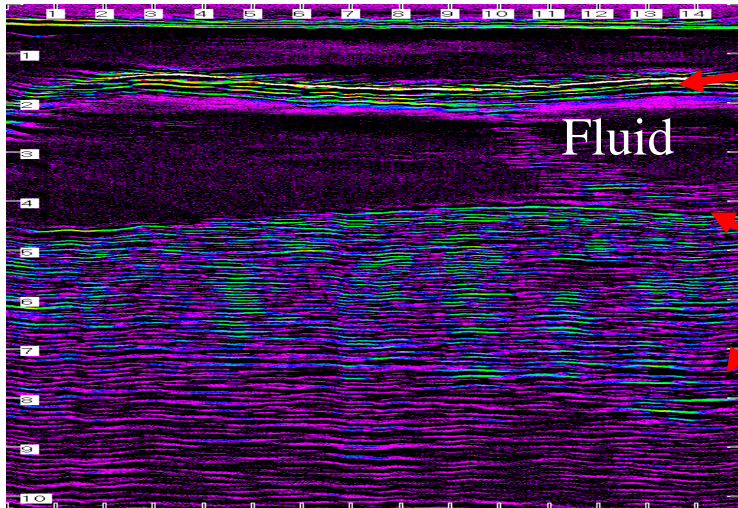
***Courtney H. Lyder, ND***  
***Professor, University of VA***

# Wound Undermining

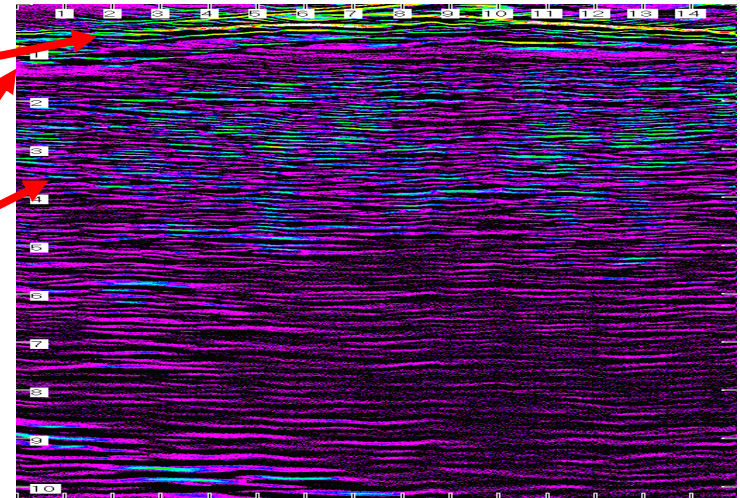


# Measuring Treatment Effectiveness

left heel (day 1)



left heel (day 7)



Epidermis

Dermis

Same heels compared a few days after heel care program implemented. Notice a dramatic reduction of fluid between epidermis and dermis

# Cost Benefit

“Our results after 1 year use of the EPISCAN I-200 includes

- 4% reduction in incidence rate,
- a \$40,000.00 liability insurance premium discount,
- improved relations with family,
- and the need to reassign our wound care nurse to other duties.”

DON North Carolina

Presented Aug 2006

NCHCFA mid-year meeting

# LONGPORT High Frequency Ultrasound Scanner

**Implement treatment based on these  
objective findings!**

“Facilities’ caregivers now can target the  
intervention much more precisely based on the  
interpretation of the scans.”

*Advanced Clinical Services*

# Control Resource Utilization

## **Risk-based and cost-effective treatments**

“..., we have found numerous benefits since we purchased your scanner...allows us to maintain a minimum number of protocols thereby reducing the variety of wound management products and associated costs.”

*Nursing Home Administrator*

# LONGPORT High Frequency Ultrasound Scanner

“Use of the scanner improved the facility’s skin care outcomes- and lowered its skin care costs by about \$30,000 in the first year of use.”

***Nancy DeFranco, RN, BSN***  
***Director of Nursing***

# Risk-based and cost-effective treatments

Implement wound care strategies best suited for wound characteristics.....

- **Patient specific**
- **Wound specific**
- **Resource control utilization**

# LONGPORT High Frequency Ultrasound Scanner

**Reduce exposure to litigation and sanctions**

“Pressure ulcers are the #1 litigated wound problem in nursing homes and long term care.”

*Courtney H. Lyder, ND*

*Professor, University of VA*

# Reduce Exposure to Litigation and Sanctions

- Advanced record keeping
- Comprehensive electronic record
- Integrate patient and wound assessment data
- Integrate treatment protocols and ultrasound images

# LONGPORT High Frequency Ultrasound Scanner

## **Conclusion:**

- The LDS is a valuable tool for pressure ulcer detection and assessment
- Can aid in the reduction of the incidence of pressure ulcers
- Can aid in the treatment of pressure ulcers
- Can aid in the reduction of liability

# Further Information

For further information on this system and its applications please contact:

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