



Understanding and Treating Suspected Deep Tissue Injury

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Abstract

Suspected Deep Tissue Injury (DTI) is the newest addition to the pressure ulcer staging system. One important question with DTI is whether this is an early enough stage in the pressure ulcer continuum to be treatable and reversible.

Our institution began using a low profile pressure mapping system on hospital mattresses. A benefit of this technology is real-time feedback to the bedside health care providers regarding effective patient re-positioning. We exploited this technology to better understand DTI in a series of 6 DTI cases. In an effort to develop a treatment and intervention algorithm, we identified cases of DTI and tracked their natural history on the pressure mapping system.

Our early findings suggest that it may be possible to reverse the course of some cases of DTI with early identification and focus on effective patient repositioning.

Introduction

DTI is a localized area of purple or maroon colored skin that is intact. This occurs from damage to underlying soft tissue from pressure and/or shear. The area may be painful, firm, mushy, boggy, warmer or cooler compared to adjacent tissue. Evolution may include a thin blister over a dark wound bed and may become covered by a thin eschar layer. Evolution to a higher stage pressure ulcer may be rapid even with treatment.

Primary treatment for DTI involves pressure relief to the suspected area and management of other risk factors. Pressure relief can be accomplished by providing a support surface properly matched to the individual needs, proper pressure redistribution, and adequate shear reduction. Overall the aim is to keep the individual off the area as much as possible.

Reducing the risk of DTI requires incorporating evidence based interventions into the routine care of all at risk patient populations. We have introduced the use of a technology which allows caregivers to confirm effective patient repositioning. We believe this addition represents a significant opportunity to incorporate effective patient repositioning (EPR) in a treatment plan.

Patient M.T.

An 80 year old male was admitted from a nursing home to the MICU for treatment of pneumonia. Patient had multiple co-morbidities and a Braden score of 11. On admission, he was noted to have a suspected DTI of the right heel measuring 4 by 5 cm. The bedside pressure mapping system was in place. Effective patient repositioning was initiated. On day 18 of hospitalization, the certified wound specialist documented 'significant improvement in the heels with decrease in involved area'.

Day 1



Day 20



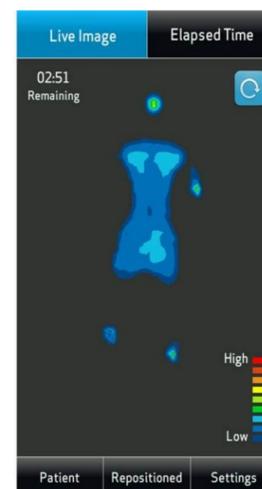
Patient W.W.

An obese 72 y.o. female was admitted to the general surgical unit after a prolonged open cholecystectomy. Braden score was 18. On postoperative day 2, the patient had evidence of a suspected deep tissue injury of the sacrum. The patient was on a bedside pressure mapping device. This allowed the bedside staff to confirm effective patient repositioning. This was combined with nutrition, wound care consults and interventions. With consistent turning based on the pressure mapping device, no other pressure ulcers occurred, and the DTI to the sacrum resolved by day 11.

Prior to Repositioning



After EPR



Conclusions

- Effective patient repositioning requires trained personnel, appropriate and available support surfaces and positioning equipment, and a mechanism to objectively confirm off-loading of at-risk tissue.
- Real time pressure monitoring feedback to the healthcare provider is an integral part of effective patient repositioning.
- Effective patient repositioning can be incorporated into the treatment protocol for suspected DTI.
- DTI treated with effective patient repositioning may be reversible.

Bibliography

1. <http://www.themapsystem.com/the-product/new-era-in-monitoring/> accessed 5/20/11
2. Ankrom MA, Bennett RG, Sprigle S, Langemo D, Black JM, Berlowitz DR, Lyder CH; National Pressure Ulcer Advisory Panel. Pressure-related deep tissue injury under intact skin and the current pressure ulcer staging systems. *Adv Skin Wound Care.* 2005 Jan-Feb;18(1):35-42. Review. PubMed PMID: 15714036.
3. National Pressure Advisory Panel & European Pressure Ulcer Advisory Panel 2009, International Guideline Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline.
4. Krapfl L.A., Gray M. Does regular repositioning prevent pressure ulcers. *J. Wound Ostomy Continence Nurs.* 2008. 35(6):571-577.
5. Salcido R, Lee A, Ahn C. Heel pressure ulcers: purple heel and deep tissue injury. *Advances in Skin and Wound care.* 2011. 24(8):374-380.

Pressure Mapping Technology

The M.A.P.™ System , Wellsense USA, Inc., Nashville, TN

