



Effectiveness of the *Biologics*™ Dolphin Bed as a Tool to Improve Tissue Perfusion in Points of Compression

Division of Plastic Surgery, UC San Diego and VA La Jolla Medical Center, San Diego, California

Som Kohanzadeh, MD; Andrew Breithaupt, MS; Artur Bondarchuk, MD; Dhaval Bhavsar, MD; Lars Evers, MD; Kevin Broder, MD; Marek Dobke, MD; Richard Bodor, MD

Background

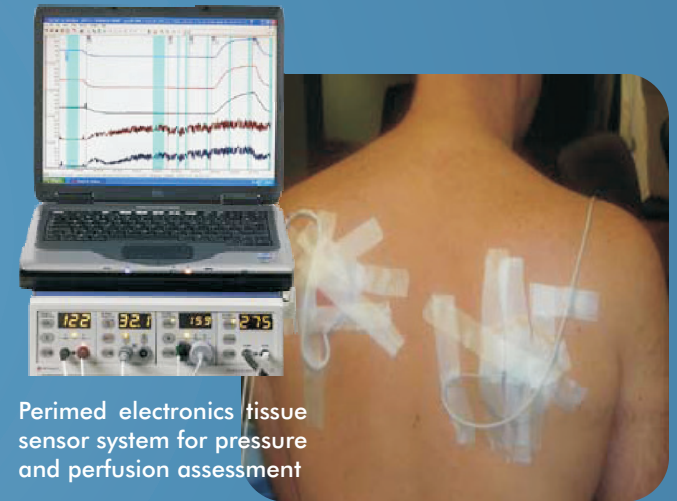
- Pressure Ulcers plague bed-bound patients
- **High incidence** of pressure ulcers: 23% of long-term care facilities residents
- **Expensive**: \$1.3 billion in costs annually
- Air-flow mattresses, Air-fluidized beds and auto turning beds have improved care
- Is there a place for an even better “smart computerized, adaptable mattress?”

Objective

Evaluate improvement of tissue perfusion by the “Dolphin Bed” (versus standard OR bed/gurney)

Materials/Methods

- Dolphin Bed (manufactured by Biologics)
- Ten (10) Volunteers
- Perimed electronics tissue sensor system (for pressure and perfusion assessment)
- Transcutaneous O_2/CO_2 sensor
- Laser Flow Doppler
- Sensors on bilateral scapula of volunteers
- Measurements (in 10 minute increments)
 - Baseline upright
 - Sitting up again (recovery to new baseline)
 - Supine on standard OR bed/gurney
 - Supine on dolphin Bed
- Percent reduction from baseline calculated
- Mean Values compared by Wilcoxon and paired t-test



Perimed electronics tissue sensor system for pressure and perfusion assessment





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Results

- Mean values: **87% retention** of perfusion on the Dolphin Bed vs **16% of baseline perfusion** for the standard bed
- All volunteers had significantly improved blood flow using the Dolphin Bed vs standard bed ($p < 0.0001$)

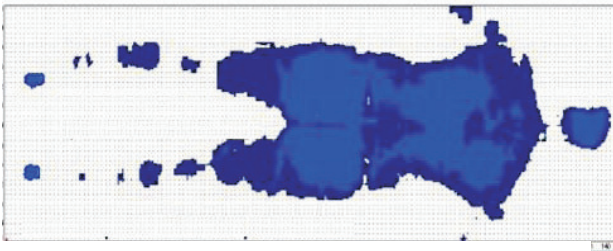
Conclusions

- Statistically significant improvement of tissue blood flow while on the Dolphin Bed relative to the standard bed and gurney
- Results warrant further study of the Dolphin Bed's potential and clinical efficacy as a tool improving outcomes of pressure sore prophylaxis and treatment

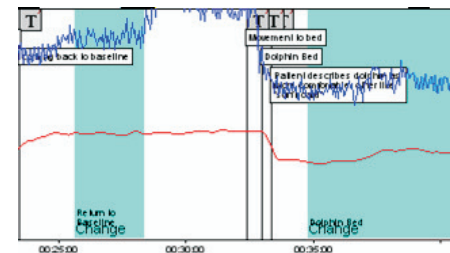
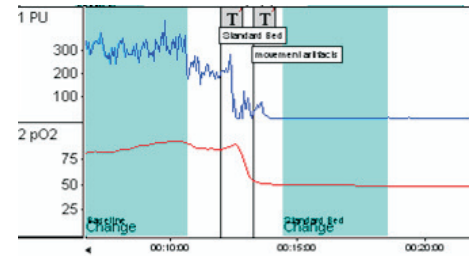
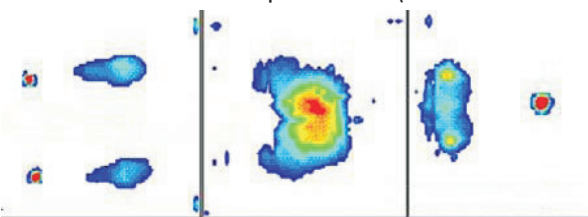
87% retention of perfusion
on the Dolphin Bed

~ versus ~

16% of baseline perfusion
for the standard bed



Pressure maps compare only the two-dimensional interface pressures between the skin and the pad surfaces (see above and below)





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% occlusion

Laser Doppler Flowometry - Vascular Occlusion

0

15

30

40

60

75

90

12.20% closed

- Engineered Foam (ALTO)
- Fluid Gel (RIK)
- Standard Foam (Skytron Pad)
- Fluid Immersion Simulation™ (Dolphin)

78.00% closed

97.59% closed

98.29% closed

