Orthotics, Casts, and Crutches: What is Practical?

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OFFLOADING THE DIABETIC FOOT

OBJECTIVES
• Describe the selection criteria for the use of various offloading modalities
• Describe the effectiveness of various offloading modalities
• Understand the role that activity plays in ulcer recurrence

The Cycle of Repetitive Stress on Insensitive Feet
Three Ways to Escape
Repetitive Stress
Inflammation
More Ulcers
Amputation
Osteomyelitis
Scarring
Deformity
Stress Correcion
Lowered Damage
Recognition of Inflammation
HEALING

How Should We Offload An Ulcer?

• Distribute pressure
• Limit dorsiflexion at the MPJ
• Limit dorsiflexion at the ankle
• Limited activity level
Common Methods to “Off-Load” the Foot

- Bed Rest
- Wheel Chair
- Crutch Assisted Gait
- Total Contact Casts
- Felted Foam
- “Half Shoes”
- Therapeutic Shoes
- Custom Splints
- Removable Cast Walkers

Total Contact Cast

- Forced compliance
- Shortens stride length
- Decrease cadence
- Reduces activity
- Reduces peak pressures

...On Offloading and Common Sense: Is the Gold Standard a Standard???

- 895 centers in 48 US States
- % Use In >Half of Plantar Wounds

Physicians concerns

- Surveillance/Infection
- Expertise
- Time
- Materials
- Reimbursement
- Topicals

Patient concerns

- “Claustrophobia”
- Hot
- Heavy
- Disrupts Sleep
- Difficult to Bathe
TCC Application Technique:

Contraindications

- Infection
- Vascular dz.
- Instability

Complications

1-3% incidence of complications

Total Contact Cast Studies:
“gold standard”?

<table>
<thead>
<tr>
<th>Author</th>
<th>% Healed</th>
<th>Average healing time</th>
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<tbody>
<tr>
<td>Myerson</td>
<td>90%</td>
<td>30 days forefoot/ 63 rear</td>
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<tr>
<td>Helm</td>
<td>75%</td>
<td>39 days</td>
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<tr>
<td>Mueller</td>
<td>95%</td>
<td>42 days</td>
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<tr>
<td>Sinacore</td>
<td>82%</td>
<td>44 days</td>
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<tr>
<td>Walker</td>
<td>100%</td>
<td>31 days forefoot/ 42 rear</td>
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<tr>
<td>Armstrong</td>
<td>100%</td>
<td>39 days</td>
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<tr>
<td>Lavery</td>
<td>100%</td>
<td>28 days midfoot ulcers</td>
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</tbody>
</table>
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Felted Foam Dressings

- 2 Layers of 1/8 inch felt and “soft sponge”
- Applied with glue to the skin or with tape
- Worn with wooden surgical shoe
- Replaced weekly

Felted Foam Concerns

- Effectiveness
- Pad movement
- Compression of materials
- Edge effect
- Reimbursement vs expense

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Removable Cast Walkers

Advantages

- User Friendly
- Surveillance
- Wound Care
- Cost effectiveness
- Patient Acceptance

Removable Cast Walkers

Cost Effectiveness

- Reuse Product
- Initiate treatment while waiting to see the physician
- Replacement Parts - Insole

Removable Cast Walkers

Physician Concerns

- Patient compliance
All Offloading Modalities Are Not the Same

Mean Peak Pressure For Ulcers Under the 1st Metatarsal Head (N/cm²)


Comparison of forefoot ulcer healing using alternative off-loading methods…

- Retrospective review - 120 consecutive patients
- Objective to compare TCC to alternative methods
  - Walking splint
  - Accommodative padding
  - Healing shoes

Birke, Adv Skin Wound Care, 2002
Comparison of forefoot ulcer healing using alternative off-loading methods...

- 7/120 did not heal (5.8%)
- After adjusting for width, depth, duration
- No difference in wound healing

Birke, Adv Skin Wound Care, 2002

OFF-LOADING CLINICAL TRIALS

RANDOMIZED TRIAL OF 3 MODALITIES
- 63 NEUROPATHIC ULCER PATIENTS
- RANDOMIZED TO TCC, REMOVABLE CAST WALKER (RCW) OR HALF SHOES (HS)
- OUTCOMES: RATE OF WOUND HEALING AND THE PROPORTION OF HEALED ULCERS AT 12 WEEKS
- PEDOMETERS TO ASSESS ACTIVITY LEVEL

Armstrong et al Diabetes Care 2001

OFF-LOADING RESULTS

- PROPORTION HEALING AT 12 WEEKS (P=0.026) SIGNIFICANTLY GREATER IN
- 89.5% TOTAL CONTACT CAST
- 65.0% REMOVABLE CAST WALKER
- 58.3% HALF SHOE

Armstrong et al Diabetes Care 2001

How should we offload the diabetic foot?

Coming Events Cast Their Shadows Before……

- Thomas Campbell -

Armstrong, Lavery, Boulton, Diabetes Care 2005

iTCC v. RCW

83%
42 days

52%
58 days