<table>
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<tr>
<th>Title</th>
<th>Guideline: Fiberglass Total Contact Casting, Removable Cast Walkers, and Irremovable Cast Walkers to Treat Diabetic Neuropathic Foot Ulcers</th>
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</table>
| Background | • Peripheral neuropathy affects approximately half of all people with diabetes and leads to muscle weakness and loss of protective sensation (LOPS) in the feet  
• The combination of LOPS and increased mechanical stress can result in foot ulcers  
• Elevated Mechanical stress, increased plantar pressures, and shear that accumulates from repetitive cycles of weight bearing activity may be caused by several factors, including:  
  - Pressure-induced ischemia over bony, weight-bearing areas due to genetic or structural abnormalities  
  - Poor-fitting or inappropriate footwear  
  - Poor walking pattern caused by neuropathy or other factors  
  - Traumatic accident  
  - Surgery  
• To effectively heal a DFU local wound management, infection control, revascularization, and pressure offloading are typically required  
• In neuropathic DFUs, pressure offloading is arguably the most important  
• Once an ulcer has formed, healing may be chronically delayed if the area is not effectively offloaded  
• Non-removable offloading techniques are most effective in healing plantar forefoot DFUs  
• Patients with DFUs have reported a preference for total contact casting (TCC) over removable cast walkers, largely because they perceive healing to be improved with TCC  
• Failure to adequately offload the neuropathic foot is common and may be due to lack of clinician knowledge, lack of resources, improper fit, and/or inconsistent use of the offloading device  
• Reduction of activity, reduction of walking speed and alternation of gait can also be used to decrease plantar pressures DFUs  
• TCC supports the foot/lower leg and redistributes pressure over the entire plantar surface of the foot to reduce pressure over the ulcer area  
• Casts may also help control and reduce swelling and protect the foot from infection  
• TCC may affect daily activities interfering with sleep, bathing and driving  
• TCC must be applied by a qualified health care professional. TCC can irritate the skin and lead to more ulcers if they are not applied appropriately  
• Removable Cast Walkers (RCW) and Irremovable Cast Walkers (ICW) keep the ankle at a 90-degree angle, reducing pressure on the forefoot  
• ICWs have been shown to be as effective as TCCs  
• RCWs can be removed to allow for more frequent dressing changes and assessment of the DFU therefore they are appropriate for use with infected wounds |
- RCWs can be removed to allow patients to sleep and bathe, however this may result in poor patient adherence
- RCWs can be made Irremovable by securing them in place with a cohesive bandage, plaster or fiberglass (18) enforcing adherence
- RCWs and ICWs are not custom-made and therefore they may not fit all patients including those with very short legs, wide feet, or severe deformities

**NOTE:** The use of “Guideline: Fiberglass Total Contact Casting, Removable Cast Walkers, and Irremovable Cast Walkers to Treat Diabetic Neuropathic Foot Ulcers” is one part of the integrated team management for DFUs

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<tr>
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<tbody>
<tr>
<td>1. a)</td>
<td>In a person with diabetes and a neuropathic plantar forefoot or mid-foot ulcer, use a non-removable knee-high offloading device with an appropriate foot-device interface as the first-choice of offloading treatment to promote healing of the ulcer.</td>
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<tr>
<td>b)</td>
<td>When using a non-removable knee-high offloading device to heal a neuropathic plantar forefoot or mid-foot ulcer in a person with diabetes, use either a total contact cast or non-removable knee-high walker, with the choice dependent on the resources available, technician skills, patient preferences and extent of foot deformity present.</td>
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<td>2.</td>
<td>In a person with diabetes and a neuropathic plantar forefoot or mid-foot ulcer for whom a non-removable knee-high offloading device is contraindicated or not tolerated, consider using a removable knee-high offloading device with an appropriate foot-device interface as the second choice of offloading treatment to promote healing of the ulcer. Additionally, encourage the patient to consistently wear the device.</td>
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<tr>
<td>3.</td>
<td>In a person with diabetes and a neuropathic plantar forefoot or midfoot ulcer for whom a knee-high offloading device is contraindicated or not tolerated, use a removable ankle-high offloading device as the third-choice of offloading treatment to promote healing of the ulcer. Additionally, encourage the patient to consistently wear the device.</td>
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<tr>
<td>4. a)</td>
<td>In a person with diabetes and a neuropathic plantar forefoot or mid-foot ulcer, do not use, and instruct the patient not to use, conventional or standard therapeutic footwear as offloading treatment to promote healing of the ulcer, unless none of the above-mentioned offloading devices is available.</td>
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<tr>
<td>b)</td>
<td>If none of the offloading devices mentioned in recommendations 1-3 are available, consider using felted foam in combination with appropriately fitting conventional or standard therapeutic footwear as the fourth choice of offloading treatment to promote healing of the ulcer.</td>
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| 5. a)     | In a person with diabetes and a neuropathic plantar forefoot or mid-foot ulcer with either mild infection or mild ischemia, consider using a non-removable...
knee-high offloading device to promote healing of the ulcer.

b) In a person with diabetes and a neuropathic plantar forefoot or mid-foot ulcer with both mild infection and mild ischemia, or with either moderate infection or moderate ischemia, consider using a removable knee-high offloading device to promote healing of the ulcer.

c) In a person with diabetes and a neuropathic plantar forefoot or mid-foot ulcer with both moderate infection and moderate ischemia, or with either severe infection or severe ischemia, primarily address the infection and/or ischemia, and consider using a removable offloading intervention based on the patient’s functioning, ambulatory status and activity level, to promote healing of the ulcer.

6. In a person with diabetes and a neuropathic plantar heel ulcer, consider using a knee-high offloading device or other offloading intervention that effectively reduces plantar pressure on the heel and is tolerated by the patient, to promote healing of the ulcer.

7. In a person with diabetes and a non-plantar foot ulcer, use a removable ankle-high offloading device, footwear modifications, toe spacers, or orthoses, depending on the type and location of the foot ulcer, to promote healing of the ulcer.

<table>
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<tr>
<th>Advantages of non-removable knee-high device</th>
<th>Disadvantages of non-removable knee-high device</th>
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<tbody>
<tr>
<td>• Highest healing rates</td>
<td>• Requires skilled and trained professional</td>
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<tr>
<td>• Distributes pressure over the entire plantar aspect of the foot</td>
<td>• Requires close monitoring</td>
</tr>
<tr>
<td>• Protects foot from trauma and infection</td>
<td>• Affects sleeping and bathing</td>
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<tr>
<td>• Controls edema</td>
<td>• Requires window to access wound or prevents daily wound monitoring</td>
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<tr>
<td>• Accommodates foot and ankle deformities including Charcot foot</td>
<td>• Exacerbated postural and balance instability</td>
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<tr>
<td>• Patient adherence due to its non-removable application</td>
<td>• Can be associated with iatrogenic re-ulceration if not carefully monitored</td>
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Determine if a non-removable offloading device is appropriate

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<tr>
<th>Indications</th>
<th>Contraindications</th>
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<tr>
<td>• non-infected neuropathic foot ulcer without deep structure involvement</td>
<td>• DFU infection</td>
</tr>
<tr>
<td>• Charcot foot</td>
<td>• Untreated osteomyelitis with copious drainage</td>
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<td></td>
<td>• Eschar in the wound</td>
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<tr>
<td></td>
<td>• Exposure of tendon, joint capsule or bone</td>
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<td></td>
<td>• Ulcer that is deeper than it is wide</td>
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Fiberglass Total Contact Casting, Removable Cast Walkers, and Irremovable Cast Walkers to Treat Diabetic Neuropathic Foot Ulcers

South West Regional Wound Care Program

Updated April 2020

Developed in collaboration with SWRWCP Stakeholders and Health Care Partners

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NOTE: The use of the following procedure is one part of the holistic management of an individual with a DFU.

Assessment

1. Thoroughly review the person’s available medical records:
   a. Determine if the patient is appropriate for TCC or RCW
   b. Review patient orders for wound care, wound debridement and application of topical agents
   c. Ensure the wound is healable and that all patient-centered concerns (including PAIN) and risk factors for wound healing have been addressed
   d. Determine if the person has any allergies that may affect the implementation of offloading devices

2. Review orders and recommendations from the Prescriber of the offloading device
   a. A prescriber must have wound care assessment expertise, gait assessment expertise, and be familiar with biomechanics of the lower limb to assess balance and mechanics with overall knowledge of offloading devices
   b. See Appendix A – page 8 for further prescriber details

Planning

1. Expected outcomes:
   a. Information from the patient’s chart, the person and/or their substitute decision maker (SMD)/power of attorney for personal care (POA), and your assessment will allow for accurate selection of appropriate offloading candidates
   b. The patient reports minimal discomfort with use of the offloading device and adherence to the device (if removable)
   c. The offloading device is assessed and no observed strike through of exudate or damage to the offloading device
   d. Patient reports safe ambulation with use of the device
   e. Registered nursing staff, in collaboration with other health care team members, the patient and/or their SDM/POA (if applicable) will use the following integrated team members are required: Prescriber, Fitter, and Monitor (See Appendix A – Page 8)

- Excessive leg or foot swelling and fragile skin
- Vascular status that is not adequate for healing - Ankle Brachial Pressure Index (ABPI) < 0.5
- Unable to eliminate risk for falls with offloading device
- Allergy to casting material
- Patient does not consent to device or need for frequent visits with offloading device application
- Once a patient with a DFU is assessed to be appropriate for TCC or ICW, the
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Information from the reassessment to determine if continued use of the offloading device remains appropriate

2. Explain the procedure and its purpose to the patient and/or their SDM/POA and obtain informed verbal or implied consent

3. Assess the need for analgesia prior to the offloading device removal and wound care treatment

Implementation

1. Initial application, removal, and re-application of the offloading device must be completed by a Fitter
   a. The fitter must have offloading device application training
   b. The fitter can also be the Prescriber and Monitor (See Appendix A – page 8)
   c. Apply the offloading device as recommended by the manufacturer

2. Assessment and treatment of the DFU must be completed by a Monitor prior to application of the offloading device
   a. Refer to the SWRWCP website www.swrwoundcareprogram.ca for guidelines on the assessment, re-assessment and management of DFUs
   b. The Monitor must be able to undertake debridement and have the knowledge, skill, judgment and authority to do so safely and appropriately according to their college and employer. The Monitor must have the tools in place to control for adverse events like bleeding, the ability to effectively manage pain associated with the procedure, and the organizational policies in place to support their practice
   c. The Monitor can also be the Prescriber and Fitter (See Appendix A – page 8)

References


### Appendix A: Role for Service Implementation

**Description:**

**Prescriber:** Must have expertise and familiarity with wound care assessment, gait assessment, biomechanics of the lower limb to assess balance and mechanics, and overall knowledge of offloading devices.

**Fitter:** Must have offloading device application training

**Monitor:** Must be able to undertake debridement and have the knowledge, skill, judgment and authority to do so safely and appropriately according to their college and employer, the tools in place to control for adverse events like bleeding, the ability to effectively manage pain associated with the procedure, and the organizational policies in place to support their practice.

<table>
<thead>
<tr>
<th>Role</th>
<th>Integrated Team Member Qualifications</th>
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| Prescriber| • Chiropodists with wound care training  
            • Podiatrists with wound care training  
            • Occupational Therapist (OT) & Physiotherapist (PT) with wound care training  
            • Physiatrists (Physical Medicine and Rehabilitation Physicians) with wound care training  
            • Family Physicians with wound care training  
            • Orthopaedic Surgeon and Vascular Surgeon with wound care training  
            • Nurse Practitioner (NP) with training in gait assessment and wound care |
| Fitter    | The following health disciplines providing they have wound care & device application training:  
            • Chiropodists, Podiatrists, Pedorthists  
            • OT/PT  
            • Physiatrists/Orthopaedic surgeon  
            • Family physicians and Nurse Practitioners  
            • Registered Health Care Professionals (such as RN’s) with advanced education: NSWOC, Master’s degree specialized in Wound Healing, International Interprofessional Wound Care Course  
            • Cast technicians |
| Monitor   | The following health care professionals with wound care training:  
            • Chiropodists, Podiatrists, Pedorthists  
            • OT/PT  
            • Physiatrists/Vascular Surgeon/ Orthopaedic surgeon  
            • Family physicians & Nurse Practitioners  
            • Registered Health Care Professionals (such as RN’s) with advanced education: NSWOC, Master’s degree specialized in Wound Healing, International Interprofessional Wound Care Course  
            • Cast technicians |