

The Practice Management of Off-loading

Here's a current survey of available products.

BY JONATHAN MOORE, DPM, MS

While it is quite clear that much has been postulated on the topic of “off-loading the diabetic foot”, there has been little discussed regarding the practical issues of knowing what products to use and when and how to get reimbursed for them (if you can get reimbursed for them).

It is not my intent to convince the reader to start off-loading your complicated diabetic or non-diabetic patients who have orthopedic conditions or those that need off-loading for wound healing (as not doing so is below the standard of care). The purpose of this article is to share some key principles on the practice management of off-loading or stabilizing the challenging foot or ankle.

The problem is that what we consider the standard of care or even common knowledge doesn't always

translate into practice.

Stephanie Wu, DPM recently published an article in *Diabetes Care* demonstrating that less than 2% of the over 900 clinical practices that treat plantar ulcerations surveyed in the U.S. were using what most consider the “gold standard” in off-loading—the total contact cast (TCC). Less than

1) TCCs must be applied by experienced technicians who have at least 20-30 minutes to apply each cast. Rushing this process or not using the right technique or materials can have disastrous results. Not only is time a factor, but lack of experience applying is also a key issue despite favorable reimbursement (Table 1).

Less than 16% of clinics studied were using a removal cast walker (RCW).

16% of clinics studied were using a removal cast walker (RCW). Most of the clinics, according to the study, were using shoe modifications only.¹

While the benefits of the TCC are widely published^{2,12} why is there such a disconnect with its utilization among providers? Here are some thoughts:

2) Many practitioners are not familiar with coding and billing procedures with TCCs and are even less aware of correct documentation requirements. Even for those who are familiar with proper billing and coding for application of TCCs, many don't find the reimbursement worth the inordinate amount of time it takes to apply them.

3) With several studies having been done recently regarding the comparable benefits of RCWs (versus the TCC), many practitioners have adopted the use of these tools instead of the TCC.^{13,14}

4) Technological advancements in the areas of biological

Continued on page 120

TABLE I
Physician Office Setting—Reimbursement

Code	Code Descriptor	Medicare Physician Reimbursement Physician Office (National Average)
CPT 29445	Application of rigid total contact leg cast	(137.26)
Q4037	Cast supplies, short leg cast, adult (11 years +), plaster	(14-15.00)
Q4038	Cast supplies, short leg cast, adult (11 years +), fiberglass	(30-40.00)

THE DIABETIC FOOT OFF-LOADING

tissues and dressings that require frequent inspection and application make TCC use difficult.

5) The disability, risk for falling, further ulceration, and infection along with the potential for other ailments

with the use of a TCC discourage many from utilizing this tool despite the fact
Continued on page 122

FIGURE I

FOOT AND ANKLE PRESCRIPTION FORM

Patient Name: _____ Date: _____

DX:

- ___ Achilles contracture 727.81
- ___ Instability of Joint/Ankle 718.87
- ___ Achilles tendonitis/bursitis 726.71
- ___ Ankle fusion 755.69
- ___ Ankle osteoarthritis 715.17
- ___ Apophysitis 732.5
- ___ Arthritis (Osteo) 719.60.
- ___ Arthritis (Rheum) 714.0
- ___ At Risk/History or Fall (V15.88)
- ___ Bunion 727.1
- ___ Heel spur 726.73
- ___ Cavovarus foot (acq) 735.75
- ___ Cavus foot 736.73
- ___ Charcot 713.5
- ___ Charcot-Marie-Tooth: 356.1
- ___ Claw toe 735.5
- ___ CVA-other late effects: 438.9
- ___ Diabetes 250. _____ (must include 2 digits)
- ___ DJD 715.0, 715. _____
- ___ Drop Foot-other: 736.79
- ___ Equinus foot 736.72
- ___ Gait abnormality/ staggering 781.2
- ___ Hallux Rigidus 735.2
- ___ Hallux Valgus (acq.) symptomatic 735.0
- ___ Hammer toe 735.4
- ___ Leg Length Discrepancy acq. 736.81
- ___ Metatarsalgia 726.70
- ___ Muscle weakness 728.87
- ___ Neuroma 355.6
- ___ Peroneal Tendonitis 726.79
- ___ Pes planus (acq.) 734.
- ___ Pes planus (cong.) 754.61
- ___ Plantar fasciitis 728.71
- ___ Rupture, Tendon, Ankle & Foot (727.68)
- ___ Sesmoiditis 733.99
- ___ Stress fracture unspec. 733.10
- ___ Tarsal tunnel 355.5
- ___ Tendonitis, tibialis (726.72)
- ___ Tibialis Tendonitis (posterior or anterior) 726.72
- ___ Unspecified deformity of the ankle/foot, acq.: 736.70
- ___ Other: _____

RX:

Foot orthotic:

- ___ Dress Orthotic: Flats or Heels (Cobra)
- ___ Casual/everyday (Semi-Rigid)
- ___ Sport (all Semi-Rigid except Soccer/Cycling)
- ___ General sport Runners Basketball Soccer/cycling
- ___ Highly Inverted _____° (for PTTD/ pronation)
- ___ Hallux Rigidus Type (carbon fiber hallux support)
- ___ Accommodative: Diabetic RA
- ___ Toe Filler with arch support (L5000)

Shoes:

- ___ Shoes w/ depth/stability (Casual/ Dress/ Sandal)
- ___ Athletic Shoes
- ___ Diabetic Shoes with OTS inlays (3 2 1 pairs)
- ___ Custom Molded with orthoses (3 2 1 pairs)

Pneumatic/Non Pneumatic Walker

- ___ Zero-G Offloading Boot Lt. Rt.
L1971, L2220, L2220, L2265
- ___ Pneumatic Walker (Ossur): Lt. Rt.
Presence of edema (782.3)
- ___ Non Pneumatic Walker (Ossur) Lt. Rt.

Ankle Brace/ OTC AFO

- ___ Gameday (Ossur) (L1906)
- ___ Bledsoe Axiom (L1971)
- ___ AirHeel (Aircast) (L1902)
- ___ Peromax AFO (L1951)
- ___ Exoform-strap Ankle (Ossur) (L1906)
- ___

Other:

- ___ Compression Hose 30-40 mmhg
- ___ Jobst 30-40 mmg Circaid 30-40mmg
- ___ Plantar Fasciitis Night Splint (L4396)
- ___
- ___

- Anticipated Length of need: 1 mos 3 mos 6 mos 1 year > 1 year
- Goals of treatment: Resolution of symptoms, stabilization of an injured area, reduction of pain, increase mobility or primarily address an orthopedic condition.
- The primary objective of this device is to address an orthopedic condition.
- I hereby certify that the product prescribed above is medically necessary in order to support/stabilize or facilitate rapid recovery for the condition for which they have presented. The items were dispensed in new, not substandard, condition and the patient was verbally taught how to use the product at home. Wear, break-in information was dispensed along with the 30 DME supplier standards.

Physician Signature

Date

that it may be the “gold standard.”

6) Despite Medicare’s stated restriction of utilizing RCWs for “pressure relief,” many still use RCWs because they reimburse better and are easier to administer than a TCC.

On the other hand, why the disconnect between studies highlighting the benefits of RCWs (their comparability to the TCC) and actual utilization?

1) Medicare’s mandate that RCWs are not reimbursable for the purpose of “relieving pressure” has significantly curtailed the utilization of RCWs for the purpose of off-loading the complicated foot; however, the lack of information discussing circumstances in which the use of a RCW would be appropriate is disconcerting.

2) Once again, there is a considerable lack of understanding regarding documentation for utilization of RCWs, even for those who have a clear orthopedic condition that qualifies one for application of a RCW. Not knowing exactly what qualifies as an “orthopedic condition” has confused enough podiatric doctors to further lower utilization.

3) Clearly, as RCWs are removable and compliance among some is poor, the RCW may not be the best option under some circumstances. Despite the fact that any RCW can be easily converted into a non-removable RCW with the use of fiberglass or plaster, this technique is apparently not being employed by most podiatric physicians.¹⁵

The bottom line is that NOT off-loading appropriately and utilizing the proper tools for the needs of your patient falls well below the standard of care.

In our practice, we use both

RCWs and TCCs, though the majority of our patients are off-loaded with RCWs. Our office utilizes the Ossur pneumatic RCW, the Ossur DH, the Bledsoe Comformer, and the Zero G suspension ankle foot orthosis (AFO).

TCC Coding

The application of a TCC (CPT 29445: application of a rigid total con-

fracture or a dislocation, CMS’ directive on cast supplies does allow for an exception with a TCC—i.e., supply codes may be used with a diagnosis of Charcot (CPT 713.5) and/or foot ulcer (CPT 707.1X). The directive, however, only permits for 1 supply unit to be billed, no matter how much material is utilized. Some Medicare carriers continue to incorrectly reject the supply codes for TCC despite the CMS directive. The result is that practitioners will need to file for a redetermination when a TCC is billed with a diagnosis other than fracture or dislocation.

Unlike the RCW, plantar ulcerations are an appropriate indication for the TCC (CPT 707.06, 707.7, 707.10, 707.12, 707.13, 707.14, 707.15, 707.19).

CPT 29445 is bundled into most debridement codes (CPT 11042, 97597). The only allowance for the use of the “59” modifier is when another ulcer is being treated on another site or limb where the TCC is being applied (e.g., TCC on RLE and you performed a debridement on the left foot).

Despite innovations in TCC application, like the TCC-EZ® (Derma Sciences) which has made application time much quicker, widespread

utilization is still not apparent. We have used the TCC-EZ system and, though much easier to apply, there is still a steep learning curve.

For purposes of laying a groundwork for our discussion regarding the practice management aspect of off-loading, below is the language that has been adopted by Medicare regarding the use of RCWs.

Continued on page 123

TABLE 2
Quick ICD-9 Dx Code Reference List Commonly Used for Richie Brace Prescriptions

Lateral Ankle Instability

Instability of Joint; Ankle and Foot, 718.87
Calc-fib Ligament Sprain, 854.02

Charcot Foot

Charcot Arthropathy, 094.0 [713.5]
Diabetic Charcot Joint, 250.6 (add the appropriate diabetic 5th digit) and [713.5]

Degenerative Joint Disease of Ankle & Rearfoot

Osteoarthritis, Localized, Primary; Ankle and Foot, 715.17
Pain, Joint; Ankle and Foot, 719.47
Tarsal Coalition, 755.87

Adult Acquired Flatfoot (PTTD)

Adult Acquired Flatfoot, 734
Rupture, Tendon; Ankle and Foot, 727.68
Pronation, Acquired, 736.79

Tendinopathy of Ankle

Tendinitis, Tibial, 726.72
Tendinitis, Peroneal, 726.79

Adapted from www.richiebrace.com/pdf/quick%20icd9%20code%20list.doc

tact cast, half leg, adult) unfortunately does not account for the cost of casting materials in the practice expense relative value unit (PE-RVU) calculation used by Medicare and other payers to establish a payment fee for application. There is a 0-day global with the utilization of CPT 29445.

While cast supplies are usually only payable with a diagnosis of a

HCPCS codes L4360 and L4386 are ankle-foot orthoses that are referred to as walking boots. Walking boots that are used to provide immobilization as treatment for an orthopedic condition or following orthopedic surgery are eligible for coverage under the brace benefit. When walking boots are used primarily to relieve pressure, especially on the sole of the foot, or are used for patients with foot ulcers, they are non-covered—no benefit category. Medicare covers therapeutic shoes, as described in the Therapeutic Shoes for Diabetics LMRP, for the prevention and treatment of diabetic foot ulcers.

GY Modifier

Suppliers must add a GY modifier to HCPCS codes L4360 and L4386 if the walking boot is only being used for the treatment or prevention of a

for therapeutic shoes. https://www.findacode.com/medicare/policies-guidelines/display-medicare-info.php?type=ARTICLE&type_id=17921

For those who have seen this policy or for those who are reading it for the first time, there are two fundamental questions that have vexed many.

1) What qualifies as an “orthopedic condition”?

2) What if an “orthopedic condition” coexists with a plantar ulceration?

For the first question regarding what constitutes an “orthopedic condition” one may use common sense, but if you search for a comprehensive “Medicare-approved” list, good luck. There is no certified list, though Table 2 (information provided by the Richie AFO website) lists orthopedic conditions that qualify for utilization of an AFO.

While this list is not comprehensive, it should give readers an idea of

The absence of a GY modifier indicates that the walking boot is being used as part of the treatment for an orthopedic condition or following orthopedic surgery.

foot ulcer. The absence of a GY modifier indicates that the walking boot is being used as part of the treatment for an orthopedic condition or following orthopedic surgery. Claims for HCPCS codes L4360 and L4386 with a GY modifier will be denied as non-covered.

Pre-fabricated walking boots must be billed with HCPCS codes L4360 and L4386. Add-on codes must not be billed in addition to these HCPCS codes. Custom fabricated walking boots must be billed with HCPCS code L2999 and must be accompanied by information identifying the manufacturer and model name (if applicable), the indication(s) for use of the boot, and an explanation of why a pre-fabricated walking boot is not sufficient.

Walking boots must not be billed with other AFO HCPCS codes, including but not limited to HCPCS codes L2106-L2116, or with HCPCS codes

what constitutes an “orthopedic” condition. So, the next obvious question is how many diabetic (or non-diabetic) patients who have a plantar ulcer ALSO have one of the above “orthopedic conditions”?

In our experience, there are more ulcer patients that have one or more of the above conditions than those without. According to the above policy if the “primary” use of the walking boot (RCW) is to relieve pressure, then they are non-covered.

Thus, if a patient has a collapsed talo-navicular joint from Charcot, or some other like orthopedic condition along with a concurrent ulcer, coverage for a RCW will depend upon which condition (Charcot or the ulcer) is being treated “primarily” with the RCW. It is critical that one document this within the medical record. What about that 67 year old diabetic who has a severe adult-ac-

Continued on page 124

THE DIABETIC FOOT OFF-LOADING

quired flat foot or posterior tibial tendon dysfunction and who has recently developed an ulcer as a result of his orthopedic condition?

Can you bill Medicare for a L4360 or L4386 legitimately? This is the question that many struggle with and few have sought to clarify this question in writing. In clinical practice, with a patient like the one described above, you must clarify in the medical record which condition you are treating “primarily” with the RCW.

diabetes make this patient significantly higher at risk for ulceration and amputation. Today, the patient was dispensed a RCW (specific name along description of product; L4360/L4386) for the primary purpose of stabilizing this patient’s deformity, improving mobility, reducing pain, and to allow the patient to resume activities of daily activity. The patient was educated regarding surgical intervention and the patient was given written and oral educational

**If a patient has an underlying
orthopedic condition along with an ulcer,
make sure your note reflects that you are treating
both conditions separately.**

In the above case, a good RCW will stabilize the deformity, reduce pain, swelling, but secondarily it may aid in healing an ulcer.

In our practice, the debridement that we perform and the wound dressings that we dispense are used as the primary treatment modality for the ulceration, while the underlying deformity that we are also treating will be addressed primarily by the RCW.

As with many areas in Medicare policy, we are left to try to interpret correctly what they want from us in order for us to remain compliant.

In the case of utilizing RCWs in practice, there are several vital tools that must be in place in order to remain compliant.

If a patient has an underlying orthopedic condition along with an ulcer, make sure your note reflects that you are treating both conditions separately.

For example, your assessment should look something like this:

Assessment and Plan

1) Severe TN joint collapse with associated osteoarthritis and intrinsic muscle atrophy right foot. X-rays have been evaluated which reveal ____ (See x-ray report) The patient’s deformity along with their neuropathy and

material to make him aware of his condition. Prognosis: Good (See attached prescription)

2) Wagner Grade 2 ulcer plantar aspect of right TN joint. The ulcer measures 3 cm X 1 cm with a depth of 4mm. There is neither drainage nor signs of infection, but the wound is full thickness. The wound is dry with keratotic borders. The bases of the wound is _____. Today the patient was prescribed Amerigel Hydrogel Saturated Gauze (number of products dispensed along with A code). (see attached prescription).

3) Diabetes/Neuropathy Risk Category 3.

It should be made clear that along with proper documentation in the note, a prescription is placed into the medical record with detailed information about the product including the goals of treatment and instructions for use. Figure 1 illustrates an example of what should be incorporated into a prescription for an RCW.

It is often the case that, no matter what the actual statistics demonstrate, cries of “overutilization” and audits scare many doctors from using the tools that would help their patients. However, doctors need to be made aware of the policy along with

Continued on page 125

the tools for proper documentation and then be allowed to use their common sense instead of being motivated by fear of an audit.

To be clear, one should not submit a RCW for reimbursement to Medicare if the primary purpose of the device is to offload or remove pressure. It is my opinion that even if the ulcer patient has a qualifying orthopedic condition, if notes are not clear as to your goals and objectives and if x-rays or no further evidence of treatment of the orthopedic condition are evident, the RCW should NOT be billed for reimbursement.

Medicare 2009 BMAD data indicates that podiatric physicians, on average, dispensed approximately 4 pneumatic and non-pneumatic walking casts per year. Clearly, there does not appear to be a financially motivated over-utilization of these types of devices, but rather just the opposite. It may be simply that providers

simply don't understand how to document properly and remain compliant with Medicare DME supplier standards.

Commonly Used In-Office Removable Cast Walkers

Ossur Equalizer Air Walker (short/tall) L4386

While this product is well known for its indications in post surgical or trauma cases, this device possesses characteristics that are also valuable in those patients who have orthopedic deformity that requires stabilization for healing.

While pneumatic products are indicated primarily in cases where there is edema or swelling, we find this to often be the case clinically. If the patient has no swelling or edema, a non-pneumatic device should be considered.

This device is easy to put on and

is lighter than some of the other devices on this list, but it also is not indicated in very heavy patients as the softer interface material can break down rapidly. The rocker-bottom component is designed to promote a more natural, stable gait while providing comfort with the foam liner.¹⁶

Obviously this device does not have a plantar insole that has the shock absorbing hexagon pieces like the DH Off-loader, but in the event that you want to add more shock absorption to the Equalizer, a Peg Assist (from Darco) can be placed into the bed. (www.ossur.com)

Ossur DH Off-loader (L4360)

The DH Off-loading walker has been used in comparative studies with the TCC which highlight the DH's off-loading characteristics and even its similar offloading capabilities.^{13,14}

As this product is designed

Continued on page 126

specifically to remove plantar pressure, it is fundamentally a non-pneumatic walking boot with a patented pressure relief insole to assist in the healing of plantar ulcers. As such, this product has been deemed inappropriate to submit for reimbursement to Medicare if its primary purpose is to off-load. If the primary goal of the RCW is to off-load, it is a non-covered item. If the primary intent of using this or any like RCW is to address an orthopedic condition whereby stabilizing foot and ankle at 90° is a part of the objective, according to Medicare policy, there should be coverage if medical justification is maintained in the patient's record.

Though the DH Walker is an effective "off-loading" RCW, it can serve the same purpose as a non-pneumatic walking boot with a rocker bottom for added gait stabilization and orthopedic stabilization. The DH Walker, like the Ossur Equalizer Walker, has a construct that is supportive yet the shell is plastic, which can be difficult for larger patients (www.ossur.com).

Bledsoe Conformer/Charcot Conformer L4360

Another product that can be used for both immobilization of the foot and ankle from trauma, Charcot or any other orthopedic condition, and also features characteristics that reduce foot pressure, is the Bledsoe Conformer

Diabetic Boot. We have used the product with good success for years as it has a solid aluminum shell with an over-1-inch pre-molded dual density foot bed. In many ways this device is comparable to a TCC in that it facilitates even weight distribution, reducing peak pressures that cause ulceration. The aluminum boot shell is adjustable to fit most leg sizes.

With a stable construct, rocker-bottom base, and excellent multi-density foot bed, this product is a good option for your complicated diabetic patients with orthopedic deformity. The Bledsoe Conformer does have a pneumatic option and there is a slightly different design available in the Charcot Conformer (L4360). This design possess a winged patellar tendon bearing plate attached in order to

**The Zero-G® is an
excellent alternative for the severe
orthopedic condition that requires
maximum stabilization
(even in very heavy patients)
along with the need for off-loading.**

enhance weight transfer away from the foot. Pollo used the Bledsoe Conformer boot in a comparison study with the TCC, finding that there was comparable or even better reduction of plantar peak pressures.¹⁷

Zero-G Suspension AFO (Universal Medical, LLC.) L1970, L2220, L2220, L2265

The Zero-G Suspension AFO is another excellent option for the Charcot patient, or patients presenting with an orthopedic condition co-existing with ulceration. The Zero-G has similar characteristics to the Bledsoe Conformer, but with some additional features. First, the adjustable leather calf corset lacer serves as an extremely effective component providing a total contact, hydrostatic lift of the inverted cone shape of the calf providing enhanced off-loading of the foot.

Additionally, the double upright malleable metal uprights with adjustable joints serve as a very strong construct for stabilization and structural support. Additionally, the excellent foot bed features a layer of 1/4 inch Plastizote overlying a 1 inch thick memory foam. While boasting one of the most shock-absorbing foot beds on the market, this AFO has an optional donning pad tool which is used to suspend the foot in the boot during application. Once the boot is secured firmly around the leg and foot, the donning pad is removed, helping to further "suspend" the foot, thereby reducing plantar pressures.

The Zero-G Suspension AFO comes with a SmartKnit® seam-free sock for soft interface along with an Evenup

Continued on page 127

shoe lift for the contralateral side. Because this product is an L1970 and not a L4360 or L4386, (L1970, Ankle Foot Orthosis, Plastic Or Other Material With Ankle Joint, Prefabricated, Includes Fitting And Adjustment) additional documentation, including a medical justification document should be utilized.

Though the Zero-G AFO reimburses considerably higher than the L4060/L4386, this product does have a higher cost. However, in my experience the Zero-G is an excellent alternative for the severe orthopedic condition that requires maximum stabilization (even in very heavy patients) along with the need for off-loading (www.zerogbrace.com).

Pearls for utilization of any RCW for Medicare billing consideration:

- 1) Document thoroughly what the primary purpose of the RCW will be.
- 2) If there is a primary orthopedic

condition that is being treated, make sure that it has been thoroughly assessed with X-ray or other imaging.

- 3) Make sure that your notes reflect that you are providing other treatment options and consideration for the orthopedic condition other

the chart for each and every item dispensed (appropriate to be an order incorporated into the body of the note) signed pickup form, wear/warranty/fitting instructions, and medical justification in your note.

- 6) Do NOT dispense a RCW for

**Do NOT dispense a RCW for Medicare billing
if the primary goal of the RCW is to offload
or remove pressure.**

than simply dispensing a walker.

- 4) If a significant orthopedic deformity coincides with an ulceration, make sure your treatment plan is specific to each condition with your goals and objectives for each indicating the primary treatment modality for each.

- 5) Follow Medicare DME supplier standards by having a prescription in

Medicare billing if the primary goal of the RCW is to offload or remove pressure.

- 7) All of the above RCWs can be made non-removable with either fiberglass or plaster. If done properly, the fiberglass will still allow further use of the RCW unless the straps or

Continued on page 128

THE DIABETIC FOOT OFF-LOADING

the fabric become damaged. Consider an under-layer of material over your RCW so as not to ruin the material or the functionality of the RCW.

Although there has been much confusion regarding the practice management of off-loading, this article should provide some assistance to the podiatric practitioner to become better at getting wounds healed and getting their patients more active faster. While the TCC remains the gold standard for off-loading, there are additional options that can be equally effective if utilized in a compliant and ethical fashion. **PM**

Disclaimer: *Every effort has been made to ensure the accuracy of this information. However, the author does not represent, guarantee, or warranty that the coding, coverage, and payment information is error-free and/or that payment will be received. The ultimate responsibility for verifying coding, coverage, and payment information accuracy lies with the reader.*

References

- ¹ Wu SC, Jensen JL, Weber AK, Robinson DE, Armstrong DG. Use of pressure off-loading devices in diabetic foot ulcers. do we practice what we preach? *Diabetes Care*. 2008; 31(11):2118-2119.
- ² Armstrong DG, Nguyen HC, Lavery LA et al. Off-loading the diabetic foot wound: a randomized clinical trial. *Diabetes Care* 24(6):1019-21, 2001.
- ³ Walker SC, Helm PA, Pullium G. Total contact casting and chronic diabetic neuropathic foot ulcerations: Healing rates by wound location. *Arch Phys Med Rehabil* 1987;68:217-21.
- ⁴ Dhawan S, Conti SF. Use of total contact casting in the diabetic foot. *Foot Ankle Clin* 2(1):115-36, 1997.
- ⁵ Myerson M, Papa J, Eaton K, Wilson K. The total-contact cast for management of neuropathic plantar ulceration of the foot. *JBJS* 74-A(2):261-9, 1992.
- ⁶ Nabuurs-Franssen MH, Huijberts MSP, Slegers R, Schaper NC. Casting of recurrent diabetic foot ulcers. *Diabetes Care* 28(6):1493-4, 2005.
- ⁷ Wukich DK, Motko J. Safety of total contact casting in high-risk patients with neuropathic foot ulcers. *Foot Ankle Int* 25(8):556-60.
- ⁸ Pollard JP, LeQuessne LP. Method of healing diabetic forefoot ulcers. *Br Med J* 1983; 286:436-7. 13. Joseph B, Joshua S, Fritschi EP. The moulded double-rocker plaster shoe in the field treatment of plantar ulcer. *Lepr Rev* 1983;54:39-44. Armstrong DG, Lavery LA. Evidence-based options for off-loading diabetic wounds. *Clin Pod Med Surg* 15(1):95-103, 1998.
- ⁹ Helm PA, Walker SC, Pullium G. Total contact casting in diabetic patients with neuropathic foot ulcerations. *Arch Phys MedRehab* 1984;65:691-3.
- ¹⁰ Pring DJ, Casiebanca N. Simple plantar ulcers treated by below-knee plaster and moulded double-rocker plaster shoe: A comparative study. *Lepr Rev* 1982;53:261-4.
- ¹¹ Sinacore DR, Mueller MJ, Diamond JE, Blair VP, Drury D, Rose SJ. Diabetic plantar ulcers treated by total contact casting. *Phys Ther* 1987;67:1543-9.
- ¹² Diamond JE, Sinacore DR, Mueller MJ. Moulded double-rocker plaster shoe for healing a diabetic plantar ulcer: A case report. *Phys Ther* 1987;67:1550-2.
- ¹³ Lavery LA, Vela SA, Lavery DC, Quebedeaux TL. Reducing dynamic foot pressures in high-risk diabetic subjects with foot ulcerations: a comparison of treatments. *Diabetes Care* 19(8):818-21, 1996.
- ¹⁴ Fleischli JG, Lavery LA, Vela SA, et al. Comparison of strategies for reducing pressure at the site of neuropathic ulcers. *JAPMA* 87(10):466-72, 1997.
- ¹⁵ Lipsky BA, van Baal JG, Harding KG. Diabetic foot infection: epidemiology, pathophysiology, diagnosis, treatment and prevention. *Clin Inf Dis* 39 S71-139, 2004.
- ¹⁶ Hanft JR, Surprenant MS. The use of the fixed ankle walker for the treatment of plantar diabetic foot ulcerations. ACFAS Abstract presented at: Joint Annual Meeting and Scientific Seminar, American College of Foot and Ankle Surgeons; February 8-12, 2000; Miami, Fla.
- ¹⁷ Pollo FE, Brodsky JW, Crenshaw SJ, Kirksey C. Plantar pressures in total contact casting versus a diabetic walking boot. *Foot Ankle Int* 2003;24(1):45-49.



Dr. Moore is board certified with the American Board of Podiatric Orthopedics and Primary Podiatric Medicine and Fellowship-trained in diabetic foot salvage at the University of Texas Health Science Center. He serves on the Board of Trustees of the American Academy of Podiatric Practice Management and is Editor of AAPPN News. Dr. Moore is a lecturer and author on diabetes and practice management topics and is in private practice in Somerset, KY.