

Indian Health Diabetes Best Practices:
Foot Care and Diabetes



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Indian Health Diabetes Best Practice: Foot Care and Diabetes

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What is diabetes foot care?

People with diabetes have special issues with their feet. Diabetes can cause nerve damage that reduces sensation in the feet and blood flow to the feet and legs. This can make it harder for cuts or sores to heal. For these reasons, foot care is an essential element of a diabetes program.

Why is diabetes foot care important?

Foot ulcers and amputations are a major cause of complications and disability for people with diabetes. However, they are among the most common *preventable* complications from diabetes. Consider these facts:

- Approximately 40% of patients with diabetes will develop peripheral neuropathy.
- Approximately 20% of patients with diabetes have acute foot problems when they come in for a routine clinical exam.
- Nearly 15% of patients with diabetes will develop foot ulcers during their lifetime.
- Most foot and lower limb amputations begin with foot ulcers. Between 5% and 10% of patients who develop diabetes foot ulcers will experience an amputation in their lifetime.

The good news is that more than half of diabetes foot complications are preventable through primary care interventions.

Best practices for diabetes foot care

The best practices for diabetes foot care describe the best methods for:

- Conducting annual foot exams in all patients with diabetes regardless of risk status.
- Conducting patient education.
- Providing podiatry care.
- Providing expertise in footwear modifications.
- Recognizing when to refer patients for vascular assessment and augmentation procedures.
- Assessing, classifying, and managing foot ulcers.

Table 1 summarizes the best practices for people *at risk* for diabetes-related foot complications.

Table 2 summarizes the best practices for people with diabetes-related foot ulcers.

Table 1. Best practices for people *at risk* for diabetes-related foot complications.

Provider Recommendations	Best Practices
<p>1. Conduct annual foot exams in all patients with diabetes regardless of risk status</p>	<p>Who? A podiatrist or health professional experienced in foot care should conduct annual foot exams.</p> <p>Why? Early recognition and management of independent risk factors for ulcers and amputations can prevent or delay the onset of adverse outcomes.</p> <p>How?</p> <ul style="list-style-type: none"> – Use a monofilament exam to test sensation on the plantar aspect of the first, third, and fifth digits and metatarsal heads of each foot. If the patient has no sensation on one or more of the tested sites, he or she is at high risk of developing an ulcer. – Inspect the foot for deformities and altered biomechanics including hammer or claw toe deformities, bunions, Charcot foot, any bony prominence, and excessive pronation. The patient is at high risk of developing an ulcer if he or she has any of these. – Conduct a vascular assessment by feeling for dorsalis pedis and posterior tibial pulses on each foot. If there are no pulses in either foot, the patient is at high risk of developing an ulcer. Alternatively, assess vascular status with an ankle brachial index (ABI). An ABI ratio of <0.9 indicates high risk. – Review the chart and ask the patient about prior ulceration or non-traumatic amputations. A history of either event confers high risk of developing an ulcer.

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Table 1. Best practices for people *at risk* for diabetes-related foot complications. (continued)

Provider Recommendations	Best Practices
<p>2. Conduct patient education</p>	<p>Who? A podiatrist or health professional experienced in foot care education should provide patient education.</p> <p>Why? Foot care education has been associated with a 40–80% reduction in ulceration and amputations.</p> <p>How?</p> <ul style="list-style-type: none"> – Offer foot care self-management education annually, and reinforce this education during follow-up visits. – Base the goal and content of the education on the patient’s risk status: <ul style="list-style-type: none"> • The goal and content of the education for low-risk patients is: <ul style="list-style-type: none"> – To prevent neuropathy and peripheral vascular disease by directing patient education at controlling blood sugar, blood pressure, and lipids. – To encourage patients who use tobacco to quit. • The goal and content for high-risk patients should address: <ul style="list-style-type: none"> – Washing and inspecting feet on a daily basis. – Clearing walking areas of dangerous objects. – Selecting and using appropriate and properly fitted footwear. – Using slippers indoors (i.e., no bare feet). – Providing proper nail and callus care (e.g., no bathroom surgery). – Avoiding extreme temperatures. – Avoiding soaking feet. – Promptly reporting problems, such as infections, ulcers, and cuts that do not heal. Advise the patient who and when to call.

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Table 1. Best practices for people *at risk* for diabetes-related foot complications. (continued)

Provider Recommendations	Best Practices
<p>3. Provide podiatry care</p>	<p>Who? A podiatrist or health professional experienced in foot care can provide care.</p> <p>Why? Podiatry care in patients with diabetes and high risk feet has been associated with increased self-care knowledge, a 54% reduction in ulceration rates, and a 75% reduction in lower extremity amputation rates.</p> <p>How?</p> <ul style="list-style-type: none"> – Include nail trimming, callus reduction, skin care, and reinforcement of education principles in basic podiatry care. – Provide a baseline podiatry assessment, with follow-up care directed by clinical findings, for all high-risk patients. – See patients with sensory loss, but otherwise normal feet, every six months. Follow-up with patients with callus and nail deformities every one to three months.
<p>4. Provide expertise in footwear modifications</p>	<p>Who? A podiatrist or health professional experienced in footwear can assist patients.</p> <p>Why? The use of protective footwear in patients with diabetes and high-risk feet has been associated with reduced planter pressures, reduced callus formation, and reduced ulceration and amputation rates.</p> <p>How?</p> <ul style="list-style-type: none"> – Match choice of footwear to risk status and identified problems: <ul style="list-style-type: none"> • Low-risk patients may use standard, commercially available footwear. • Patients with sensory loss and normal shaped feet may use standard shoes with a stable heel counter and padded insert. • Patients with moderate deformities should use extra-depth shoes with a custom molded insert. • Patients with advanced deformity may require custom molded shoes and inserts. – Instruct all high-risk patients on footwear selection, fitting, and break-in. Reassess shoes for excessive internal and external wear every three to six months and replace as needed.

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Table 1. Best practices for people *at risk* for diabetes-related foot complications. (continued)

Provider Recommendations	Best Practices
<p>5. Recognize when to refer patients for vascular assessment and augmentation procedures</p>	<p>Who? A podiatrist or health professional with experience in foot care can refer patients for vascular assessment and augmentation procedures.</p> <p>Why? There is insufficient evidence supporting the use of vascular surgery for ulcer prevention in patients with diabetes.</p> <p>How? Generally limit referral for definitive vascular assessment and augmentation procedures in the non-ulcerated diabetic foot to patients with rest pain, night pain, or claudication that limits the quality of life.</p>

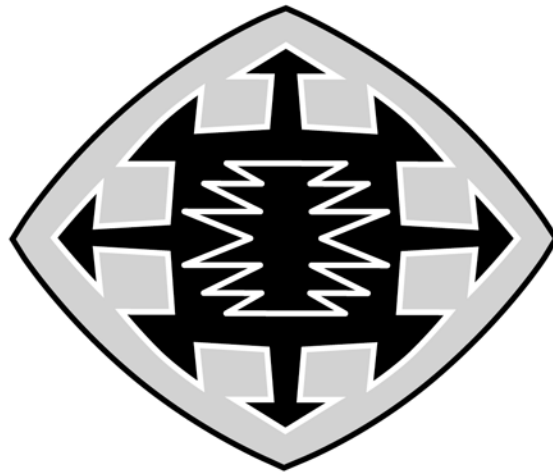


Table 2. Best practices for people with foot ulcers.

Provider Recommendations	Best Practices
<p>1. Assess the ulcer</p>	<p>Who? A podiatrist or health professional experienced in foot wound care can assess the ulcer.</p> <p>Why? Evidence suggests that assessment and active management of wounds reduces the progression to more severe complications up to and including amputations.</p> <p>How? Begin the management of wounds by assessing the following criteria:</p> <ul style="list-style-type: none"> – Lower extremity blood flow. – Wound dimensions. – Quality of the wound bed and edges. – Surrounding erythema and cellulites. – Mechanism of injury. – Penetration to deep structures. – Signs of systemic infection. – Blood sugar control. – Other health risk factors, such as alcohol and tobacco use.
<p>2. Classify the ulcer</p>	<p>Who? A podiatrist or health professional experienced in foot wound care can classify an ulcer.</p> <p>How? Classify the wound as simple or complex based on the following clinical findings:</p> <p><u>Simple Ulcer</u></p> <ul style="list-style-type: none"> – Wound dimensions <2 cm in diameter and <0.5 cm deep. – Periwound cellulitis <2 cm and no ascending infection. – No deep space infection. – Pulses are present and ischemic symptoms are absent. – Patient temperature <38 degrees C. – White blood cell (WBC) count <12,000.

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Table 2. Best practices for people with foot ulcers. (continued)

Provider Recommendations	Best Practices
<p>2. Classify the ulcer (continued)</p>	<p><u>Complex Ulcer</u></p> <ul style="list-style-type: none"> – Wound dimensions >2 cm in diameter and >0.5 cm deep. – ≥ 2 cm peri-wound cellulitis or presence of ascending infection. – Presence of deep space infection. – Absent pedal pulses or the presence of ischemic symptoms. – Patient temperature >38 C. – WBC >12,000. – Ulcers that fail to improve after two weeks of management.
<p>3. Manage the ulcer</p>	<p>Who? A podiatrist or health professional experienced in foot wound care can manage the ulcer.</p> <p>Why? Consistent application of evidence-based wound management is associated with improved foot wound outcomes.</p> <p>How? Manage simple and complex ulcers in accordance with the following general guidelines:</p> <p><u>Simple Ulcer</u></p> <ul style="list-style-type: none"> – Provide weekly debridement and wound measurement. – Limit weight bearing (e.g., bed rest, wheelchair, crutches, healing shoe, and total contact cast). – Perform daily dressing changes, using specialized dressing materials as needed. – Provide appropriate wound healing environment. – Use oral antibiotics in the presence of signs and symptoms of infection after obtaining appropriate wound cultures. Avoid surface swabs. – Reinforce the care plan through patient education. – Provide home care follow-up every one to three days to assess compliance to care plan. – Monitor healing through weekly medical follow-up in the clinic, and modify care plan as needed.

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Table 2. Best practices for people with foot ulcers. (continued)

Provider Recommendations	Best Practices
<p>3. Manage the ulcer (continued)</p>	<p><u>Complex Ulcer</u></p> <ul style="list-style-type: none"> – Provide wide surgical debridement, including cultures of excised tissue or bone. – Perform daily post-operative dressing changes, using appropriate dressing materials to provide optimal wound healing environment. – Promote strict non-weight bearing with use of crutches, wheelchairs, and best rest, or off-load the wound with adaptive devices such as total contact cast or wound healing boots. – Optimize metabolic control. – Provide parenteral antibiotic therapy for deep space infection (e.g., abscess or osteomyelitis) that is directed by wound culture sensitivity results. – Refer patients with signs or symptoms of ischemia to definitive vascular evaluation and treatment. – Provide patient education to promote required self-care practices following hospital discharge. – Include frequent outpatient visits for wound care and monitoring of progress in the post-hospital care plan. Modify plan as needed. – Consider the patient as high risk for re-ulceration once the foot ulcer has healed. Provide vigilant follow-up with special attention to preventive measures.



Best practices for health care organizations

A health care organization that wants to improve foot care must be motivated and prepared for change throughout the entire organization. The organization’s leadership must identify foot care improvement as important work. They must also develop clear improvement goals, policies, and effective improvement strategies. This will help encourage the entire organization to make changes that will help improve foot care and diabetes.

Table 3 describes the best practices for health care organizations.

Table 3. Best practices for health care organizations.

Organization Recommendations	Best Practices
<p>System and programmatic changes</p>	<p>Who? Administration and diabetes team members can work together to implement the system and programmatic changes.</p> <p>Why? Changes in health care systems have been associated with increased delivery of appropriate diabetes care.</p> <p>How? The evidence suggests that the following activities can help improve diabetes care:</p> <ul style="list-style-type: none"> – Implement registries and appointment systems to improve diabetes clinic participation and follow-up. – Use clinical practice guidelines to facilitate evidenced-based clinical decision-making and improve diabetes foot care outcomes. – Use flowsheets and standing orders to improve documentation of appropriate care. – Provide training and continuing education to health care providers to help increase frequency of diabetes foot exams. – Provide community foot care education to help increase clinic participation and reduce amputation rates.

Essential elements of best practice diabetes foot care programs

High quality diabetes foot care involves implementing six essential elements* in your health care organization. These elements are:

- Community resources and policies.
- Health care organization leadership.
- Patient self-management support.
- Delivery system design: Services, programs, systems, and procedures.
- Decision support: Information and training for providers.
- Clinical information systems: Collecting and tracking information.

Table 4 summarizes how these elements apply to basic, intermediate, and comprehensive diabetes foot care programs.

*Adapted from the Chronic Care Model, which was developed by the MacColl Institute for Healthcare Innovation at the Group Health Cooperative. For more information on the Chronic Care Model, visit their website at www.improvingchroniccare.org.

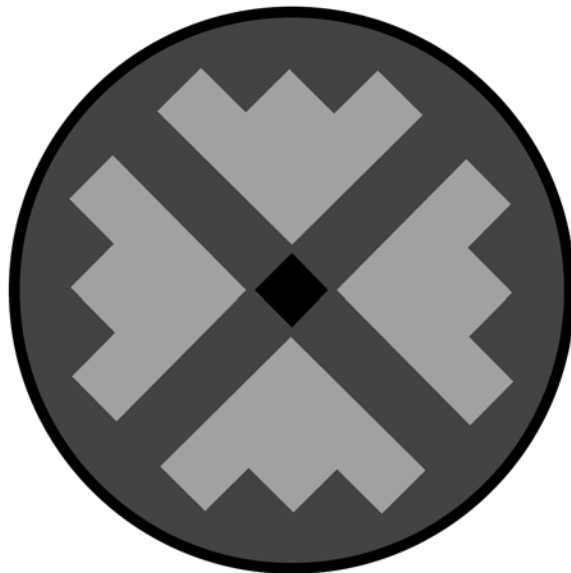


Table 4. Essential elements of basic, intermediate, and comprehensive best practice foot care programs for patients with diabetes.

Basic Foot Care Programs	Intermediate Foot Care Programs Basic program <i>plus</i> :	Comprehensive Foot Care Programs Basic and intermediate programs <i>plus</i> :	Examples
Community resources and policies			
<ul style="list-style-type: none"> - Develop clear mechanisms for referring patients to home care, field health workers, podiatry care, footwear specialists, and surgery. 	<ul style="list-style-type: none"> - Train field health personnel in foot risk assessment and risk-specific foot care education. - Conduct an inventory of community footwear resources. 	<ul style="list-style-type: none"> - Establish agreements or contracts with local vendors to provide risk-appropriate footwear. - Ensure that foot care programs and the local dialysis program work together. - Develop and implement community education programs on diabetes foot care. 	<ul style="list-style-type: none"> - Establish a referral and communication channel between dialysis programs to clinic services. - Train homecare nurses, community health representatives (CHR), and public health nurses (PHN).

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Table 4. Essential elements of basic, intermediate, and comprehensive best practice foot care programs for patients with diabetes. (continued)

Basic Foot Care Programs	Intermediate Foot Care Programs Basic program <i>plus</i> :	Comprehensive Foot Care Programs Basic and intermediate programs <i>plus</i> :	Examples
Organization leadership			
<ul style="list-style-type: none"> - Support quality improvement in foot care. 	<ul style="list-style-type: none"> - Include specific foot care process measures in the clinic's annual goals. 	<ul style="list-style-type: none"> - Include specific foot care outcome measures in the annual performance-based objectives. 	<ul style="list-style-type: none"> - Include the following in organization goals: (1) reduce incidence of foot ulcers and lower extremity amputations among patients with diabetes by x%; and (2) increase appropriate foot care services among patients with diabetes by x%. - Establish an accurate diabetes registry that includes complications data. - Develop the capacity to conduct audits that monitor foot care practice. - Cascade foot care practices into performance-based evaluations. - Allot programmatic time for continuous quality improvement (CQI). - Dedicate appropriate resources to foot care.

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Table 4. Essential elements of basic, intermediate, and comprehensive best practice foot care programs for patients with diabetes. (continued)

Basic Foot Care Programs	Intermediate Foot Care Programs Basic program <i>plus</i> :	Comprehensive Foot Care Programs Basic and intermediate programs <i>plus</i> :	Examples
Patient self-management support			
<ul style="list-style-type: none"> – Offer risk-appropriate self-care education. 	<ul style="list-style-type: none"> – Provide education within the framework of an Indian Health Service (IHS)-certified (or equivalent) curriculum. 	<ul style="list-style-type: none"> – Develop and implement a comprehensive foot care education program with modules on wound care. 	<ul style="list-style-type: none"> – Ensure patients have access to health care providers who are skilled in and knowledgeable about diabetes foot care. – Use customized Patient Care Component (PCC) forms with education code boxes. – Use an education curriculum with components for risk categories and wound management. – Use the Resource and Patient Management System (RPMS) case management package. – Prescreen charts and flag needed education services.

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Table 4. Essential elements of basic, intermediate, and comprehensive best practice foot care programs for patients with diabetes. (continued)

Basic Foot Care Programs	Intermediate Foot Care Programs Basic program <i>plus</i> :	Comprehensive Foot Care Programs Basic and intermediate programs <i>plus</i> :	Examples
Delivery system design: Services, programs, systems, and procedures			
<ul style="list-style-type: none"> – Establish a diabetes foot care team. – Establish a diabetes team that meets on a regular basis. 	<ul style="list-style-type: none"> – Make podiatry care available on-site or through a referral mechanism that is easy for the patient to use and ensures communication back to the primary care provider. – Ensure that vascular assessment and surgery services are available. 	<ul style="list-style-type: none"> – Include the formal foot care team as part of the diabetes team. – Ensure that wound care and footwear services are available on-site or through mechanisms convenient to both patients and providers. – Establish a surgery outreach program. 	<ul style="list-style-type: none"> – Develop specific action plans to address identified needs, such as diabetes foot exams and referrals to educators and podiatrists. – Use a registry-based appointment system. – Establish a diabetes clinic and a foot care clinic. – Ensure patients have access to a foot care nurse, podiatrist, and physical therapist with expertise in foot care. – Ensure that a footwear specialist is on staff or contract.

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Table 4. Essential elements of basic, intermediate, and comprehensive best practice foot care programs for patients with diabetes. (continued)

Basic Foot Care Programs	Intermediate Foot Care Programs Basic program <i>plus</i> :	Comprehensive Foot Care Programs Basic and intermediate programs <i>plus</i> :	Examples
Decision support: Information and training for providers			
<ul style="list-style-type: none"> - Adopt foot care screening practices, such as the practices included in the IHS Standards of Care for Patients with Diabetes. - Train providers in performing complete diabetes foot exams. 	<ul style="list-style-type: none"> - Adopt detailed foot care guidelines. 	<ul style="list-style-type: none"> - Adopt detailed foot care guidelines that include wound management. - Train local providers in comprehensive foot care. 	<ul style="list-style-type: none"> - Use Staged Diabetes Management. - Use critical pathways, which are management plans that display goals for patients and provide the sequence of actions necessary to achieve the goals. - Use tools, such as <i>Feet Can Last a Lifetime: A Health Care Provider's Guide to Preventing Diabetes Foot Problems</i> and the <i>Lower Extremity Amputation Prevention (LEAP) Program Curriculum</i>. - Provide training by local experts. - Ensure access to online tools, such as online links to clinical practice guidelines and other references. - Reinforce education principles and the rationale for checking feet regularly.

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Table 4. Essential elements of basic, intermediate, and comprehensive best practice foot care programs for patients with diabetes. (continued)

Basic Foot Care Programs	Intermediate Foot Care Programs Basic program <i>plus</i> :	Comprehensive Foot Care Programs Basic and intermediate programs <i>plus</i> :	Examples
Clinical information systems: Collecting and tracking information			
<ul style="list-style-type: none"> – Establish a diabetes registry. – Document annual foot risk assessments in the medical record. – Conduct annual diabetes audits. 	<ul style="list-style-type: none"> – Establish a diabetes registry capable of tracking foot care process measures (e.g., risk assessments, foot care education, and podiatry referrals), and listing them on the Health Summary. 	<ul style="list-style-type: none"> – Establish a diabetes registry capable of tracking foot care outcomes (e.g., ulcers and lower extremity amputations), and listing them on the Health Summary. 	<ul style="list-style-type: none"> – Use an RPMS-based diabetes registry. – Use customized PCC foot forms and case management flowsheets. – Track patients according to risk category. – Provide risk-level appropriate patient and provider reminders.

Evaluating your diabetes foot care program

Evaluation is important because it helps you see what is working and what is not working in your foot care program for people with diabetes. It will show you if adjustments or changes need to be made in order to improve your program. Evaluation also provides you with information that you can use to share your successes with patients, providers, tribal leaders, administrators, the community, funders, and other stakeholders.

Consider including the following data in your evaluation:

- Foot exams.
- Risk-appropriate foot care education.
- Foot ulceration rates.
- Amputation rates (e.g., major, minor, and first lower extremity amputations).

Sustaining your diabetes foot care program

Often, for care goals to be reached, programs must be in place for more than a few years. Here are some helpful tips for sustaining your program:

- Bill for podiatry, education, and home care services.
- Obtain third party reimbursement for footwear.
- Establish contracts with footwear vendors to provide services at Medicare and Medicaid negotiated rates.
- Report your success to the local community through a newsletter that includes educational messages.
- Offer walk-in podiatry and wound care services, and make your services user-friendly.
- Have the clinic director establish an “internship” program with the local podiatrist. The podiatrist could train local clinic providers, such as nurses or physicians, in basic nail, callus, and ulcer care.
- Encourage clinics to become model clinics. Share their expertise through regional workshops and invite other clinics to make site visits to observe the model clinics at work.
- Track and report clinical outcomes and share your successes with the clinic and other providers.
- Establish referral systems with regional wound care centers.

Contacting others for help

Contacting other people involved in foot care programs is important because they can help you get started. Your peers at other health care organizations can share their expertise, materials, and ideas, and can also tell you what has worked for them and what has not worked. This can help you avoid reinventing the wheel. Here are some tips on how to connect with others:

- Ask your Area Diabetes Consultant for the names of people who may be able to help you.
- Contact the IHS Division of Diabetes Treatment and Prevention for ideas. They may be able to point you in the right direction.
- Ask the IHS Integrated Diabetes Education Recognition Program for suggested contacts. They have names and contact information for people who work with IHS-accredited diabetes education programs.
- Flip through issues of *Health for Native Life Magazine*. The magazine profiles many diabetes programs throughout Indian Country. The articles may give you ideas for activities to try and people to contact.
- Review resources from the National Diabetes Education Program (NDEP). NDEP offers materials that will help your program get started, including information specifically for American Indians and Alaska Natives. You can access these resources at the website: www.ndep.nih.gov

Real-world best practice programs

Alaska Native Medical Center Podiatry Program

Charles Edwards, DPM

☎ (907) 729-3927

✉ cedwards@anmc.org

The program has been funded with *Special Diabetes Program for Indians* (SDPI) funds, and includes a podiatrist, a case manager, a certified pedorthist trained with SDPI funds, and the Alaska Native Medical Center diabetes team. The program has demonstrated decreased rates of amputations through its comprehensive program, and the data have been published in the *International Journal of Circumpolar Health* (Schraer *et al.*, 2004). The program has become self-sustaining and will no longer require SDPI funding support starting in October 2006.

Phoenix Indian Medical Center (PIMC)

Eugene Dannels, DPM

☎ (602) 263-1200

PIMC has vast clinical experience and a comprehensive foot care program.

Red Lake Hospital


Charmaine Branchaud, RN, CDE

☎ (807) 727-2066

Red Lake Hospital has achieved successful outcomes in a primary care setting.

Urban Inter-Tribal Center of Texas (UITCT)

Rodney Stapp, DPM, CEO

 (214) 941-1050

UITCT has successfully implemented shoe and basic foot care awareness programs.

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