Title	**Guideline: The Management of People with Diabetic/Neuropathic Foot Ulcers**
Indications	This guideline is intended to be used by registered health care providers to guide their management of individuals with a diabetic or neuropathic foot ulcer.
Guideline	**Factors that may impact skin integrity and wound healing – discussion with patient necessary to identify risk factors and modifications as necessary:** • Glycemic level –hyperglycemia results in delayed wound health and compromised chemotaxis and phagocytosis • Activity – patients may participate in activities that are not appropriate for their risk (eg. Running) • Smoking – compromises blood flow • Trauma – loss of protective sensation increases risk for injury • Footwear – poorly fitting footwear increases risk for skin breakdown • Peripheral arterial disease – impacts blood flow to the wound • History of wounds – healed areas are more vulnerable to re-injury • Amputation – abnormal mechanics and ill-fitting prosthetics may cause pressure leading to tissue injury • Age – age-related changes in structure and function of the skin can result in risk of injury and reduced healing potential **Management Guidelines for Diabetic/Neuropathic Foot Ulcers (Modified from the International working group for the Diabetic Foot 2019 Practical Guideline – full guideline available at:** https://iwgdfguidelines.org/practical-guidelines/) 1. Pressure offloading and ulcer protection: a. The preferred offloading treatment of plantar ulcers is a non-removable knee-high offloading device such as a total contact cast or a removable cast walker that has been made irremovable. b. When a non-removable knee-high offloading device is contraindicated or not tolerated by the patient consider a removable knee-high offloading device such as a DH walker or Air Cast. c. For heel ulcers, have the person elevate their heels completely off the bed or other pressure causing surfaces, using pillows or pressure relieving devices. This is necessary even if the patient is on a therapeutic surface. d. In non-plantar ulcers, use removable ankle-high offloading devices, footwear modifications, toe spacers, or orthoses depending on type and location of the foot ulcer. e. For those diagnosed with Charcot foot, manage based on the stage of the defect and consultation with an orthopedic specialist is necessary 2. Restoration of Tissue Perfusion: a. In patients with an ABPI of <0.5 or toe pressure <30mmHg consider urgent referral to vascular surgeon b. Emphasize efforts to reduce cardiovascular risk = smoking cessation, control of hypertension and dyslipidemia, control of glycemic level 3. Local Ulcer Care:

	a. Regular inspection of the ulcer is essential – frequency depends on the severity of the ulcer, presence of infection, amount of exudate, and wound treatment b. Debridement of necrotic tissue and surrounding callus should be performed by a trained health care provider who has the knowledge, skill, and competency to do so. Please refer to your respective college and employer's policies and procedures before undertaking this task. c. Select dressing to control exudate and maintain moist wound healing environment. **CAUTION: Application of a moisture retentive dressing in presence of ischemia and or dry gangrene can result in a serious life or limb threatening infection** d. DO NOT soak the feet – this may induce skin maceration and breakdown e. Consider Negative Pressure for post-operative wounds – collaborate with most responsible physician/surgeon f. Please refer to IWGDF Practical Guidelines page 13-14 for additional therapies to be considered if the ulcer fails to heal after 4-6 weeks despite optimal care as otherwise outlined in the guideline 4. Treatment of Infection: a. Infection in the foot of a person with diabetes is a serious threat to that limb and must be evaluated and treated promptly b. Signs of infection may be muted due to neuropathy and/or ischemia and systemic factors are often absent c. Teach that new onset or worsening pain is potentially a sign of infection and requires immediate medical attention d. Superficial ulcer with limited soft tissue (mild) infection: i. Cleanse, debride all necrotic tissue and surrounding callus ii. Update primary care provider. Patient should be assessed for empiric oral antibiotic therapy e. Deep or extensive infection (moderate or severe infection) i. Have the patient attend their nearest urgent care clinic or emergency department if there are signs/symptoms of sepsis ii. Update the primary care provider f. In the presences of visible or probing to bone – update the primary care provider and wound care specialist. The patient should be assessed for the presence of osteomyelitis. 5. Advocate for or request Interdisciplinary referrals : a. Wound Care Specialist: for conservative sharp debridement, treatment planning, adjunct therapies b. Registered Dietician: diet, nutrition, glycemic control, supplementation, weight control c. Speech Language Pathologist: presence or risk of developing a swallowing impairment d. Certified Diabetic Educator: diet, nutrition and lifestyle counseling e. Physiotherapy: mobility/exercise plan, mobility/gait/range of motion assessment f. Occupational Therapist: assistive devices, assessment of functional status, fall risk assessment and recommendations

	g. Orthotist/Pedorthist/Podiatrist: appropriate footwear/offloading device, professional foot assessment and care h. Social Work: psychosocial and economic/community supports i. Endocrinologist/Diabetologist: glycemic control, diabetes education j. Vascular surgeon: vascular assessment +/- surgical correction k. Orthopedic surgeon: for recurrent forefoot ulcerations, refer for consideration of surgical interventions, i.e. Achilles tendon lengthening l. Infectious Diseases: for wounds complicated by bacteremia, sepsis, advancing cellulitis or osteomyelitis 6. Person centered concerns: a. Manage pain through advocacy and collaboration with the patient and primary health care provider. Considerations may include encouraging the patient to take their pain medication prior to dressing change, non-pharmacological methods such as distraction/guided imagery. b. Ensure that the plan of care reflects and includes the patients concerns, goals, abilities, and preferences. 7. Education for the patient and/or support person(s) a. Washing feet daily (with water below 37©C), drying well - especially between the toes and moisturizing dry skin with emollients - not between the toes b. Avoiding soaking of the feet c. Inspecting all surfaces of the feet daily - including between the toes – if the patient is unable to independently do this, discuss further with the patient and determine who can assist d. Assessing shoes daily, and shaking out shoes before putting them on e. Wearing light coloured diabetic soaks without seams, holes, wrinkles and changing socks daily f. Avoiding the following: walking barefoot, in socks without footwear, in thin-soled slippers, sandals, flip flops, narrow pointed shoes, high heels, Crocs g. Wearing properly fitting footwear at all times, indoors and out h. Having their shoes professionally chosen/fitted i. The importance of regular professional foot care and how to cut toenails properly j. Protecting their feet from heat/cold/injury k. Avoiding the use of chemical agents/plasters to remove corns and calluses l. Routine diabetic foot and footwear assessments by their family physician/nurse practitioner, i.e. yearly at a minimum m. Controlling their blood sugar thru exercise, diet, and medication, i.e. HgbA1c less than 7%, and the relationship between high glycemic levels and complications n. Quitting smoking o. Exercising regularly (low impact, i.e. swimming, bicycling) and eating a well-balanced diabetic diet p. Signs and symptoms of infection/complications and when/how/who to seek **IMMEDIATE** help q. Provide resources/links to reinforce health teaching

	i. SWRWCP's " My Diabetic Foot Ulcer" – available at: https://swrwoundcareprogram.ca/Uploads/ContentDocuments/pamphlet%20-%20dfu2.pdf ii. "Drop your Socks" – available at: http://swrwoundcareprogram.ca/Uploads/ContentDocuments/Drop%20You%20Socks%20Leaflet.pdf **NOTE: The goals of education are to improve the person's foot care knowledge, awareness and self-protective behaviours, and to enhance their motivation and skills to facilitate adherence to this behavior** 8. Re-evaluate a. Regularly and consistently measure the ulcer, weekly at a minimum, using the same method b. Conduct a comprehensive reassessment to determine wound progress and he effectiveness of the treatment plan, i.e. using the "NPUAP PUSH Tool 3.0", weekly at a minimum c. If the wound is not healing at an expected rate despite the implementation of best practice interventions, you need to: i. Update the primary care provider and wound care specialist ii. Re-evaluate plan of care and advocate for or request referrals iii. Discuss barriers or challenges with the patient d. Reassess pain at **EVERY** dressing change and more frequently as reported by the patient, using the same pain tool/scale each time. Report pain management issues to the person's primary care physician or primary care nurse practitioner 9. Notify the primary care physician or primary care nurse practitioner immediately if the following occur: a. Acute onset of pain or increasing pain b. Wound probes to bone (if this is a new finding) c. Gangrene develops or worsens d. Rest pain develops in the foot e. Previously palpable peripheral pulses are diminished or absent f. Signs of localized and/or systemic infection develop 10. Documentation: a. Document initial and ongoing assessments as per your organizations guidelines b. Document care plans, implementation strategies, and outcome measurements as per your organizations guidelines
Outcomes	1. Intended: a. The wound closes and drainage ceases. Expected rate of healing is a reduction of wound surface area by a minimum of 20-30% in 3-4 weeks b. The wound remains infection free c. The patient indicates that pain is resolved or manageable

	d. The patient understands and acts on the need for daily foot inspection and appropriate foot care, accurate dietary and glycemic control, and pressure redistribution e. The patient can identify signs and symptoms of infection, and can describe how, when and whom to contact when problems occur f. The patient becomes independent in the self-management of their wound 2. Unintended: a. The wound dose not close, worsens, becomes infected, develops gangrene, pain increases b. The patient requires an amputation where one was not anticipated. c. The patient does not understand the need for daily foot inspection and other measures needed to decrease the risk of future tissue damage and diabetic complications d. The patient shows no evidence of understanding and acting on educational information received e. The patient does not understand the signs and symptoms of infection/complications, and when, how and whom to seek help from f. The patient does not become independent in self-management of their wound
References	1. Schaper, N.C., et al. 2019. IWGDF Practical guidelines on the prevention and management of diabetic foot ulcers. Available at: https://iwgdfguidelines.org/practical-guidelines/ [Accessed May 13, 2020]. 2. Botros, M., et al. 2017. Best Practice Recommendations for the Prevention and Management of Diabetic Foot Ulcers. Available at: https://www.woundscanada.ca/docman/public/health-care-professional/bpr-workshop/895-wc-bpr-prevention-and-management-of-diabetic-foot-ulcers-1573r1e-final/file [Accessed May 13, 2020].