Quality Standards

Diabetic Foot Ulcers

Care for Patients in All Settings

Health Quality Ontario

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Summary

This quality standard focuses on care for people who have developed or are at risk of developing a diabetic foot ulcer. The scope of the standard covers all settings, including primary care, home and community care, long-term care, and acute care. It also provides guidance on optimal care when a person transitions between these settings—for example, when someone is discharged from a hospital to their home or a long-term care home.

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About Quality Standards

Health Quality Ontario, in collaboration with clinical experts, patients, residents, and caregivers across the province, is developing quality standards for Ontario.

Quality standards are concise sets of statements that will:

- Help patients, residents, families, and caregivers know what to ask for in their care
- Help health care professionals know what care they should be offering, based on evidence and expert consensus
- Help health care organizations measure, assess, and improve their performance in caring for patients

The statements in this quality standard do not override the responsibility of health care professionals to make decisions with patients, after considering each patient's unique circumstances.

How to Use Quality Standards

Quality standards inform clinicians and organizations about what high-quality health care looks like. They are based on the best available evidence.

They also include indicators to help clinicians and organizations assess the quality of care they are delivering, and to identify gaps and areas for improvement. These indicators measure process, structure, and outcomes.

In addition, tools and resources to support clinicians and organizations in their quality improvement efforts accompany each quality standard.

For more information on how to use quality standards, contact:
qualitystandards@hqontario.ca.

About This Quality Standard

Scope of This Quality Standard

This quality standard focuses on care for people who have developed or are at risk of developing a diabetic foot ulcer. The scope of the standard covers all settings, including primary care, home and community care, long-term care, and acute care. It also provides guidance on optimal care when a person transitions between these settings—for example, when someone is discharged from a hospital to their home or a long-term care home. It is one of three quality standards related to wound care; the other two are for pressure injuries and venous leg ulcers.

Why This Quality Standard Is Needed

Diabetes is one of the most prevalent chronic diseases, with about 1 in 10 people in Ontario currently affected.[1] Diabetic foot ulcers are a serious and common complication of diabetes; 15% to 25% of people with diabetes will develop a diabetic foot ulcer during their lifetime.[2] People with diabetic foot ulcers report poor overall health-related quality of life, particularly in terms of pain, discomfort, and loss of mobility.[3] Diabetic foot ulcers are the cause of about a third of all nontraumatic below-the-knee amputations in Canada.[4] For people with a diabetic foot ulcer and peripheral arterial disease, the probability of death after a major amputation is approximately 50% within 2 years.[5]

Wound care represents a significant area of opportunity for quality improvement in Ontario. There are important gaps and variations in access to services and in the quality of care received by people who have developed or are at risk of developing a diabetic foot ulcer. In 2014, the amputation rate in the local health integration network (LHIN) with the highest rate was almost eight times that of the LHIN with the lowest rate (Discharge Abstract Database, IntelliHEALTH, 2016). Previous efforts to improve the coordination and delivery of wound care across the province have highlighted the inconsistent application of best practice guidelines, a lack of standardized documentation and tracking of wound outcome measures, and poor coordination of care.[6]

Based on the best available evidence and guided by expert consensus from health care professionals and people with lived experience, this quality standard addresses key areas with significant potential for quality improvement in the care of people who have developed or are at risk of developing a diabetic foot ulcer in Ontario. The 12 quality statements that make up this standard provide guidance on high-quality care, with accompanying indicators to help health care professionals and organizations measure their own quality of care. Each statement also includes details on how it affects people who have developed or are at risk of developing a diabetic foot ulcer, their caregivers, health care professionals, and health care services at large.

Note: In this quality standard, the term patient *includes community care clients and residents of long-term care homes.*

Principles Underpinning This Quality Standard

This quality standard is underpinned by the principles of respect and equity.

People who have developed or are at risk of developing a diabetic foot ulcer should receive services that are respectful of their rights and dignity and that promote self-determination.

A high-quality health system is one that provides good access, experience, and outcomes for all Ontarians, no matter where they live, what they have, or who they are.

People who have developed or are at risk of developing a diabetic foot ulcer are provided services that are respectful of their gender, sexual orientation, socioeconomic status, housing, age, background (including self-identified cultural, ethnic, and religious background), and disability.

How We Will Measure Our Success

We have set a limited number of objectives for this quality standard as a whole, and we have mapped these objectives to indicators to measure success. In addition, each quality statement within this quality standard is accompanied by one or more indicators to measure the successful implementation of the statement.

- Percentage of patients with a new diabetic foot ulcer in a 6-month period (incidence)
- Percentage of patients with a diabetic foot ulcer in a 6-month period (prevalence)
- Percentage of patients with a closed diabetic foot ulcer in a 12-week period
- Percentage of patients with a healed diabetic foot ulcer who were diagnosed with a secondary diabetic foot ulcer within 1 year (recurrence)
- Percentage of patients with a diabetic foot ulcer who had a lower-extremity amputation in a 6-month period
- Percentage of patients with a diabetic foot ulcer in a 12-month period who reported high satisfaction with the care provided

Quality Statements in Brief

QUALITY STATEMENT 1:
Risk Assessment

People with diabetes are assessed for their risk of developing a diabetic foot ulcer when they are diagnosed with diabetes and at least once a year thereafter. Patients at higher risk are assessed more frequently. All risk assessments are performed using standard, validated tools.

QUALITY STATEMENT 2:
Patient Education and Self-Management

People with diabetes and their families or caregivers are offered education about diabetic foot care and complications, including basic foot care; how to prevent foot complications and monitor for the signs and symptoms of foot complications; and who to contact in the event of a concerning change.

QUALITY STATEMENT 3:
Referral to an Interprofessional Team

People with a diabetic foot ulcer are referred to an interprofessional team that delivers ongoing, coordinated, integrated care. If they have major complications, they are seen within 24 hours by a team that delivers emergency services and then referred to an interprofessional team for ongoing care.

QUALITY STATEMENT 4:
Comprehensive Assessment

People with a diabetic foot ulcer or foot complications undergo a comprehensive assessment that informs their individualized care plan and includes evaluation of vascular status, the presence of infection, and pressure redistribution to determine the healing potential of the wound.

QUALITY STATEMENT 5:
Individualized Care Plan

People with a diabetic foot ulcer or foot complications have a mutually agreed-upon individualized care plan that identifies patient-centred concerns and is reviewed and updated regularly.

QUALITY STATEMENT 6:
Pressure Redistribution

People with a diabetic foot ulcer or foot complications are offered pressure-redistribution devices as part of their individualized care plan.

QUALITY STATEMENT 7:
Wound Debridement

People with a diabetic foot ulcer have their wound debrided if it is determined as necessary in their assessment, and if it is not contraindicated. Debridement is carried out by a trained health care professional using an appropriate method.

QUALITY STATEMENT 8:
Local Infection Management

People with a diabetic foot ulcer and a local infection receive appropriate treatment, including antimicrobial and non-antimicrobial interventions.

QUALITY STATEMENT 9:
Deep/Surrounding Tissue Infection or Systemic Infection Management

People with a diabetic foot ulcer and a suspected deep/surrounding tissue infection or systemic infection receive urgent assessment (within 24 hours of initiation of care) and systemic antimicrobial treatment.

QUALITY STATEMENT 10:
Wound Moisture Management

People with a diabetic foot ulcer receive wound care that maintains the appropriate moisture balance or moisture reduction in the wound bed.

QUALITY STATEMENT 11:
Health Care Provider Training and Education

People who have developed or are at risk of developing a diabetic foot ulcer or foot complications receive care from health care providers with training and education in the assessment and management of diabetic foot ulcers and foot complications.

QUALITY STATEMENT 12:
Transitions in Care

People with a diabetic foot ulcer or foot complications who transition between care settings have a team or provider who is accountable for coordination and communication to ensure the effective transfer of information related to their care.

1

Risk Assessment

People with diabetes are assessed for their risk of developing a diabetic foot ulcer when they are diagnosed with diabetes and at least once a year thereafter. Patients at higher risk are assessed more frequently. All risk assessments are performed using standard, validated tools.

Background

For people with diabetes, regular assessment is important for determining their risk of developing a diabetic foot ulcer. Risk factors for diabetic foot ulcers include peripheral neuropathy, foot abnormalities and deformities, peripheral arterial disease, and previous ulcers or amputations.[7]

People with an active diabetic foot ulcer should be referred to and treated immediately by health care professionals who provide specialized care (see Quality Statement 3).

Sources: American Diabetes Association, 2016[10] | Canadian Diabetes Association, 2013[11] | Commonwealth of Australia, 2011[12] | International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Society for Vascular Surgery, 2016[13]

What This Quality Statement Means

For Patients

You should be assessed for your risk of developing a foot ulcer when you are diagnosed with diabetes and at least once a year after that.

For Clinicians

Assess every person with diabetes for their risk of developing a diabetic foot ulcer using a standard, validated tool. People should be assessed when they are diagnosed with diabetes and at least once a year thereafter to determine if their risk level has changed. If they have risk factors for diabetic foot ulcers, they should be reassessed more frequently.

For Health Services

Ensure that health care professionals have access to standard, validated risk-assessment tools and are knowledgeable about the frequency of diabetic foot ulcer risk assessment.

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Frequency of risk assessment

Assessments should be completed at least once a year,[7,8] but more frequently for people at higher risk: every 6 months for people with peripheral neuropathy; every 3 to 6 months for people with peripheral neuropathy plus peripheral arterial disease and/or a foot deformity; and every 1 to 3 months for people with peripheral neuropathy and a history of foot ulcers or lower-extremity amputation.[7]

Standard validated tools

These should address the following components, at a minimum:

- Examination of both legs and feet (including the spaces between the toes) for evidence of:
  - Neuropathy (e.g., using a 10 g monofilament)
  - Ulceration
  - Callus
  - Skin temperature (a difference of 2°C or 3–4°F between the two feet could indicate infection, issues with vascular supply, or deep trauma)
  - Structural abnormalities and deformities
  - Charcot arthropathy

Quality Indicators

Process Indicator

Percentage of people with diabetes who have had a diabetic foot ulcer risk assessment using a standard, validated tool in the previous 12 months

- Denominator: number of people with diabetes
- Numerator: number of people in the denominator who have had a diabetic foot ulcer risk assessment using a standard, validated tool in the previous 12 months
- Data source: local data collection
- Potential stratification: risk level

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Standard validated tools (continued)

  - Swelling of the calf, thigh, or ankles
  - Skin colour changes
  - Skin and nail changes
  - Range of motion, gait, and footwear
  - Palpation of foot pulses (top of foot and inner ankle)
- Asking about previous foot ulcers and amputations
- Ankle-brachial pressure index or toe-brachial pressure index at regular intervals to screen for peripheral arterial disease (calcified arteries may falsely elevate results in people with diabetes, so results should be interpreted carefully)

One example of a standard validated tool is Inlow's 60-second Diabetic Foot Screen Tool.[9]

2

Patient Education and Self-Management

People with diabetes and their families or caregivers are offered education about diabetic foot care and complications, including basic foot care; how to prevent foot complications and monitor for the signs and symptoms of foot complications; and who to contact in the event of a concerning change.

Background

Providing education to people who have developed or are at risk of developing a diabetic foot ulcer, as well as their families and caregivers, can enable them to play an active role in foot examination and care. People involved in self-management can help prevent an initial ulcer, detect the signs and symptoms of an ulcer early on, monitor existing ulcers to prevent complications, and prevent recurrent ulceration. Educational materials should be offered in both oral and written formats[8] and be tailored to a person's language and education level where possible, to support understanding. Written materials should also include pictures and diagrams to help people monitor for the signs and symptoms of foot complications and identify any concerning changes.

Sources: American Diabetes Association, 2016[10] | Canadian Diabetes Association, 2013[11] | Commonwealth of Australia, 2011[12] | International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14] | Society for Vascular Surgery, 2016[13]

What This Quality Statement Means

For Patients

You and your family or caregiver should be taught how to take care of your feet. You should also be taught how to check for foot problems such as ulcers, and who to contact for help.

For Clinicians

Offer people with diabetes and their families or caregivers education about diabetic foot care and complications, including basic foot care; how to prevent foot complications and monitor for the signs and symptoms of complications; and who to contact in the event of a concerning change.

For Health Services

Ensure the availability of educational materials on diabetic foot care and complications for people with diabetes and their families and caregivers.

Quality Indicators

Process Indicators

Percentage of people with diabetes and their families or caregivers who are offered education about basic foot care

- Denominator: number of people with diabetes
- Numerator: number of people in the denominator who, along with their families or caregivers, are offered education about basic foot care
- Data source: local data collection

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Education

This should be interactive, done in partnership with patients, and include the following topics:

- When diabetes is diagnosed and during follow-up risk assessments (see Quality Statement 1):
  - Self-management skills, including goal-setting and problem-solving
  - Individual risk of developing an ulcer
  - Basic foot care (callus care; nail care, including cutting toenails straight across; and skin care, including daily foot inspections and washing)
  - How to protect feet and avoid foot trauma
  - Safe exercise
  - Smoking cessation
  - Properly fitting footwear
  - Monitoring for the signs and symptoms of ulcers
  - Diabetes management information, nutrition education, and blood glucose control
  - Who to contact in case of a concerning change

PROCESS INDICATORS CONTINUED

Percentage of people with diabetes and their families or caregivers who are offered education about how to prevent foot complications, how to monitor for the signs and symptoms of foot complications, and who to contact in the event of a concerning change

- Denominator: number of people with diabetes
- Numerator: number of people in the denominator who, along with their families or caregivers, are offered education (such as printed materials, video presentations, and in-person resources/instruction) about how to prevent foot complications, how to monitor for the signs and symptoms of foot complications, and who to contact in the event of a concerning change
- Data source: local data collection

Structural Indicator

Availability of diabetes education materials that provide foot care education for people with diabetes and their caregivers

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Education (continued)

- When diabetic foot ulcers occur, as part of the individualized, integrated care plan:
  - Overview of the type of ulcer
  - How to care for the other foot
  - Pressure-redistribution devices and offloading
  - Wound care
  - Diabetes management information, nutrition education, and blood glucose control
  - Who to contact in case of a concerning change

Concerning changes

These include signs and symptoms of a foot ulcer or complication, such as loss of protective sensation; skin discolouration (a red or dusky colour indicating possible dependent rubor or gangrene); skin temperature change (an increase could mean infection, and a decrease could mean ischemia); foot pressure injury (damage to the skin and/or underlying soft tissue); change in pain or new pain; swelling; or odour.

3

Referral to an Interprofessional Team

People with a diabetic foot ulcer are referred to an interprofessional team that delivers ongoing, coordinated, integrated care. If they have major complications, they are seen within 24 hours by a team that delivers emergency services and then referred to an interprofessional team for ongoing care.

Background

The effective management of diabetic foot ulcers to prevent recurrence and amputation requires coordinated and specialized interprofessional collaboration between care settings (primary care, inpatient, and outpatient). An integrated approach recognizes that a single specialist does not have all of the skills and knowledge to effectively manage and treat people with diabetic foot ulcers.[12] The members of the team do not need to operate at a single location. People will require access to different types and levels of care, depending on their level of risk. People who have peripheral neuropathy and a history of foot ulcers or amputation, as well as people who have an active diabetic foot ulcer or complication, require access to a team that specializes in diabetic foot care and includes experts from many disciplines working together.[7]

Sources: American Diabetes Association, 2016[10] | Canadian Diabetes Association, 2013[11] | Commonwealth of Australia, 2011[12] | International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14]

3

Referral to an Interprofessional Team

What This Quality Statement Means

For Patients

If you have a diabetic foot ulcer, you should be referred to a team of care providers. If you have major complications, you should be seen within 24 hours by a team that delivers emergency services and then be referred to a team of health care professionals for ongoing care.

For Clinicians

Ensure people with a diabetic foot ulcer are referred to an interprofessional team. Ensure people with a diabetic foot ulcer and major complications are seen within 24 hours by emergency services, and then refer them to an interprofessional team for ongoing care.

For Health Services

Ensure that systems and procedures are in place so that people with diabetic foot ulcers receive care from an interprofessional team. Ensure that systems and procedures are in place so that people with diabetic foot ulcers and major complications are seen within 24 hours by a team that delivers emergency services and then referred to an interprofessional team for ongoing care.

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Interprofessional team

This includes the following:

- Most people with diabetic foot ulcers require access to a primary care practitioner, a podiatrist or chiropodist, and a diabetes nurse
- People with peripheral neuropathy, peripheral arterial disease, and/or a foot deformity may also require access to an endocrinologist, one or more surgeons (e.g., orthopedic or vascular), and a radiologist

Major complications

These are limb- and/or life-threatening and include acute ischemia, signs and symptoms of deep/surrounding tissue infection or systemic infection, osteomyelitis, and acute Charcot arthropathy.

Quality Indicators

Process Indicators

Percentage of people with a diabetic foot ulcer who are referred to an interprofessional team that delivers ongoing, coordinated, integrated care

- Denominator: number of people with a diabetic foot ulcer
- Numerator: number of people in the denominator who are referred to an interprofessional team that delivers ongoing, coordinated, integrated care
- Data source: local data collection

Percentage of people with a diabetic foot ulcer and major complications who are seen within 24 hours by a team that delivers emergency services

- Denominator: number of people with a diabetic foot ulcer and major complications
- Numerator: number of people in the denominator who are seen within 24 hours by a team that delivers emergency services
- Data source: local data collection

4

Comprehensive Assessment

People with a diabetic foot ulcer or foot complications undergo a comprehensive assessment that informs their individualized care plan and includes evaluation of vascular status, the presence of infection, and pressure redistribution to determine the healing potential of the wound.

Background

A comprehensive assessment helps identify causative and contributing factors, supports accurate diagnosis, and informs treatment and management. The results of the assessment help to determine the healability of the ulcer (ulcers may be classified as healable, maintenance, or non-healable) and inform a corresponding approach to optimal wound care and management.[15] Healable wounds have adequate blood supply and can be healed if the underlying cause is addressed and treated. Maintenance wounds have healing potential, but barriers are present that may prevent healing (such as lack of access to appropriate treatments or poor adherence to treatment). Non-healable wounds are not likely to heal because of non-treatable causes or illnesses.[15] The characteristics, dimensions, and healing trajectory of the ulcer should be documented at each visit. Comprehensive assessment also provides an opportunity to determine risk factors for recurrence, which is important for diabetic foot ulcers, given their high rate of recurrence.[13] Depending on the care setting, the components of the assessment may be carried out by multiple members of an interprofessional team.

Sources: American Diabetes Association, 2016[10] | Commonwealth of Australia, 2011[12] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14]

What This Quality Statement Means

For Patients

If you have a diabetic foot ulcer or other foot problem, you should have a full assessment. Your health care team will want to learn more about your health history, concerns, and preferences. They will also examine your legs and feet, including any wounds you have.

For Clinicians

Carry out a comprehensive assessment (including evaluation of vascular status, infection status, and pressure redistribution) of people with a diabetic foot ulcer or foot complications to determine the healing potential of the wound. The results should inform their individualized care plan.

For Health Services

Ensure that tools, systems, processes, and resources are in place to help clinicians assess people with a diabetic foot ulcer or foot complications. This includes providing the time required for a full assessment and ensuring access to assessment tools.

Quality Indicators

Process Indicators

Percentage of people with a diabetic foot ulcer or foot complications who have a comprehensive assessment at first presentation that informs their individualized care plan

- Denominator: number of people with a diabetic foot ulcer or foot complications
- Numerator: number of people in the denominator who have a comprehensive assessment at first presentation that informs their individualized care plan
- Data source: local data collection

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Foot complications

These include factors that may lead to soft-tissue breakdown and ulceration, such as dry skin, callus, blister, deformities, minor fractures, and subacute Charcot arthropathy.

Comprehensive assessment

This includes the following components, at a minimum:

- A comprehensive health history, including medical history, diabetes management and glycemic control (hemoglobin A1c), nutritional status, smoking status, allergies, medications, family history, and psychosocial history (including socioeconomic factors)[16]
- A physical examination of the affected limb(s), including an assessment of:
  - Vascular status
  - Motion and functioning
  - Neuropathy
  - Signs and symptoms of infection
  - Charcot changes and foot deformities
  - Pressure and ability to offload or redistribute pressure, including an examination of footwear

PROCESS INDICATORS CONTINUED

Percentage of people with a diabetic foot ulcer or foot complications who have a comprehensive assessment at each transition that informs their individualized care plan

- Denominator: number of people with a diabetic foot ulcer or foot complications
- Numerator: number of people in the denominator who have a comprehensive assessment at each transition that informs their individualized care plan
- Data source: local data collection

Percentage of diabetic foot assessments that include evaluation of vascular status

- Denominator: number of diabetic foot assessments
- Numerator: number of assessments in the denominator that include evaluation of vascular status
- Data source: local data collection

Percentage of diabetic foot assessments that include evaluation for the presence of infection

- Denominator: number of diabetic foot assessments
- Numerator: number of assessments in the denominator that include evaluation for the presence of infection
- Data source: local data collection

Percentage of diabetic foot assessments that include evaluation for pressure redistribution

- Denominator: number of diabetic foot assessments
- Numerator: number of assessments in the denominator that include evaluation for pressure redistribution
- Data source: local data collection

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Comprehensive assessment (continued)

  - Foot and ankle anatomy and assessment of the weight-bearing foot and gait
  - Swelling (thigh, calf, and ankle)
  - Muscle pain (during exercise)
  - Palpation of foot pulses (top of foot and inner ankle)
  - Colour changes
- Wound assessment:
  - Length, width, depth, and location
  - Presence and severity of pain
  - Exudate, odour, and condition of the tissue in the wound bed and around the wound
- Grading and documenting the severity of the wound using a standardized system such as SINBAD (site, ischemia, neuropathy, bacterial infection, area, and depth) or the University of Texas classification system
- Factors that may impact wound healing and activities of daily living
- Individual concerns and preferences

5

Individualized Care Plan

People with a diabetic foot ulcer or foot complications have a mutually agreed-upon individualized care plan that identifies patient-centred concerns and is reviewed and updated regularly.

Background

An individualized care plan guides effective, integrated coordination and delivery of care. Consideration of factors that may affect the healing potential of the wound (ulcers may be healable, maintenance, or non-healable—see Quality Statement 4 for definitions) is essential for optimizing healing conditions and quality of life. These factors include wound characteristics such as necrosis, infection, or vascular supply; individual characteristics such as comorbidities, cognitive impairment, or adherence to the care plan; and environmental or socioeconomic characteristics such as access to services or needed pressure-redistribution devices (including the ability to pay for those devices).[14]

The inclusion of mutually agreed-upon goals enables the health care team to review and monitor the person's progress over time and adjust treatment plans based on what is working well and what should be discontinued.[14] Regular review of the care plan also provides an opportunity to repeat aspects of the comprehensive assessment, revisit goals, review progress, and make adjustments based on the changing needs and preferences of the person receiving care.

Sources: National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14]

5

Individualized Care Plan

What This Quality Statement Means

For Patients

Your health care professional should work with you to develop a care plan that reflects your needs, concerns, and preferences. A care plan is a written document that you have developed with your health care professional. It describes your goals for your care, the care you will receive, and who will provide it.

For Clinicians

Work with people who have a diabetic foot ulcer or foot complications to create a mutually agreed-upon individualized care plan that identifies patient-centred concerns and is reviewed and updated regularly.

For Health Services

Ensure that systems, processes, and resources are in place to support clinicians in developing individualized care plans for people with a diabetic foot ulcer or foot complications. This may also include tools such as standardized care plan templates.

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Foot complications

These include factors that may lead to soft-tissue breakdown and ulceration, such as dry skin, callus, blister, deformities, minor fractures, and subacute Charcot arthropathy.

Individualized care plan

This includes:

- Results of the comprehensive assessment (see Quality Statement 4), including risk factors and the dimensions, characteristics, and healing trajectory of the ulcer
- Education (see Quality Statement 2)
- Mutually agreed-upon goals of care based on individual concerns and preferences
- Factors that may affect wound healing, and patient-centred concerns such as pain management, optimizing activities of daily living, and psychosocial needs and supports

Quality Indicators

Process Indicators

Percentage of people with a diabetic foot ulcer or foot complications who have a mutually agreed-upon individualized care plan that identifies patient-centred concerns

- Denominator: number of people with a diabetic foot ulcer or foot complications
- Numerator: number of people in the denominator who have a mutually agreed-upon individualized care plan that identifies patient-centred concerns
- Data source: local data collection

Percentage of people with a diabetic foot ulcer or foot complications who have had their care plan reviewed and updated regularly

- Denominator: number of people with a diabetic foot ulcer or foot complications
- Numerator: number of people in the denominator who have had their care plan reviewed an updated regularly (frequency may range from daily to every 3 months)
- Data source: local data collection
- Potential stratification: healable, maintenance, or non-healable ulcer

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Individualized care plan (continued)

- A plan for local wound care based on the healing potential of the wound, which may include the following:
  - Pressure redistribution and appropriate footwear
  - Infection management (localized, deep/surrounding tissue, and systemic infection)
  - Debridement
  - Dressings and moisture balance
  - Strategies for preventing recurrence

Reviewed and updated regularly

Frequency may range from daily (during dressing changes and based on regular wound assessments) to weekly (if cast changes are needed) to every 1 to 3 months (for a full care plan review) and is based on the characteristics of the wound, the acuity of the foot problem, and whether or not there are significant changes. Reviewing the care plan may require a partial reassessment (repeating aspects of the comprehensive assessment) or a full reassessment, including revisiting the goals of care.

6

Pressure Redistribution

People with a diabetic foot ulcer or foot complications are offered pressure-redistribution devices as part of their individualized care plan.

Background

A key component of treating diabetic foot ulcers and preventing recurrence is reducing pressure on the foot, which can be achieved by pressure redistribution and offloading. There are many options for redistributing pressure on the feet, from therapeutic footwear and orthotic devices (which can be beneficial in preventing recurrent ulcerations), to total contact casts (which have shown to be an effective treatment for diabetic foot ulcers).[17,18]

Sources: Canadian Diabetes Association, 2013[11] | Commonwealth of Australia, 2011[12] | International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14] | Society for Vascular Surgery, 2016[13]

What This Quality Statement Means

For Patients

As part of your care plan, you should be offered ways to take pressure off your foot so it can heal, and to prevent future ulcers, too. These methods could include a non-removable cast, a cast walker, or special shoes.

For Clinicians

Offer pressure-redistribution devices to people with a diabetic foot ulcer or foot complications, to treat and heal an existing diabetic foot ulcer or to prevent recurrent ulceration.

For Health Services

Ensure access to pressure-redistribution devices for people with a diabetic foot ulcer or foot complications, to treat and heal an existing diabetic foot ulcer or to prevent recurrent ulceration.

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Foot complications

These include factors that may lead to soft-tissue breakdown and ulceration, such as dry skin, callus, blister, deformities, minor fractures, and subacute Charcot arthropathy.

Pressure-redistribution devices

These devices should be prescribed and fitted or applied by a regulated health care professional at the point of care. The type of device used depends on the person's needs (prevention of recurrence or treatment) and should be based on the comprehensive assessment.

- Prevention of recurrence:
  - Custom therapeutic footwear and orthotic devices (for those with previous ulcers or amputations)
- Treatment:
  - Total contact casting (in the absence of infection and peripheral arterial disease; for forefoot and midfoot ulcers)
  - Removable cast walker (which can also be made irremovable) as an alternative to a total contact cast (for those who require frequent dressing changes, or for whom an irremovable device cannot be tolerated), wheelchair, or crutches

Quality Indicators

Process Indicators

Percentage of people with a diabetic foot ulcer or foot complications who are offered pressure-redistribution devices

- Denominator: number of people with a diabetic foot ulcer or foot complications
- Numerator: number of people in the denominator who are offered pressure-redistribution devices
- Data source: local data collection

Percentage of people with a diabetic foot ulcer or foot complications who use pressure-redistribution devices

- Denominator: number of people with a diabetic foot ulcer or foot complications
- Numerator: number of people in the denominator who use pressure-redistribution devices
- Data source: local data collection

Percentage of people who have had a diabetic foot ulcer in the past who use pressure-redistribution devices

- Denominator: number of people who have had a diabetic foot ulcer in the past
- Numerator: number of people in the denominator who use pressure-redistribution devices (e.g., custom therapeutic footwear and orthotic devices)
- Data source: local data collection

7

Wound Debridement

People with a diabetic foot ulcer have their wound debrided if it is determined as necessary in their assessment, and if it is not contraindicated. Debridement is carried out by a trained health care professional using an appropriate method.

Background

The purpose of debridement is to remove nonviable, dead (slough and/or necrotic) tissue, callus, and foreign matter (debris) from the wound to reduce infection and promote healing. There are many methods of debridement, but the most common are sharp/surgical, autolytic, and mechanical.[14] The choice of method and frequency of debridement should be based on individual tolerance and preference; the time to complete debridement; the size of the wound and presence of infection; the type of exudate; the amount and nature of foreign matter present; and the skill and training of the health care professional.[14] Sharp debridement requires specialized knowledge, education, and skills.[19]

Sources: Canadian Diabetes Association, 2013[11] | Commonwealth of Australia, 2011[12] | International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14] | Society for Vascular Surgery, 2016[13]

7

Wound Debridement

What This Quality Statement Means

For Patients

To help your wound heal, you should have dead skin, callus, and debris removed (this is called debridement) if you and your health care professional determine that it is necessary and appropriate.

For Clinicians

Debride wounds for people with a diabetic foot ulcer using an appropriate method of debridement if it is determined as necessary in their assessment, and if it is not contraindicated. Sharp/surgical debridement should be considered first, unless it is contraindicated.

For Health Services

Ensure that health care professionals across settings who care for people with diabetic foot ulcers are trained in appropriate methods of wound debridement. This includes providing access to training programs and materials.

Quality Indicators

Process Indicator

Percentage of people with a diabetic foot ulcer who have their wound appropriately debrided by a trained health care professional if it is determined as necessary in their assessment and included in their care plan

- Denominator: number of people with a diabetic foot ulcer and wound debridement determined as necessary in their assessment
- Numerator: number of people in the denominator who have their wound appropriately debrided (using sharp/surgical, mechanical, or autolytic methods) by a trained health care professional
- Data source: local data collection

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Contraindication

Inadequate vascular supply.

Appropriate method of debridement

Sharp/surgical debridement should be considered first for the removal of slough, dead tissue, and callus, unless there is inadequate vascular supply, and if it is in alignment with the individualized care plan and mutually agreed-upon goals of care. Sharp/surgical debridement may be active/aggressive (extensive and aggressive removal of tissue) or conservative (removal of loose, dead tissue without pain or bleeding). Other appropriate methods include mechanical and autolytic debridement. Pain should be managed during debridement.

Trained health care professional

The health care professional has training specific to the method of debridement being used.

8

Local Infection Management

People with a diabetic foot ulcer and a local infection receive appropriate treatment, including antimicrobial and non-antimicrobial interventions.

Background

People with diabetes are more susceptible to infection (over half will develop a skin and soft-tissue infection), and older individuals with diabetes may be at even higher risk if they have comorbidities, which can mask the severity of the infection.[14,20] Local infection may be suspected when three or more of the following signs and symptoms are present: stalled healing (ulcer is not healing at the expected rate or is growing quickly); increased amount of exudate; red and bleeding tissue; increased amount of dead tissue; and foul odour.[21] The severity of diabetic foot infections can be classified as mild/localized (superficial or local to the skin and subcutaneous tissue), moderate/deep (deeper wound, such as an abscess, osteomyelitis, septic arthritis, or fasciitis), or severe/systemic (local infection with signs of systemic inflammatory response syndrome).[14,22]

Antibiotic therapy is not required if there is no evidence of soft-tissue or bone infection.[10] Antibiotics should be used in alignment with organizational policies and procedures for antimicrobial stewardship.

Sources: International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14]

What This Quality Statement Means

For Patients

If your wound is infected, you should receive treatment, including antibiotics and non-antimicrobial interventions.

For Clinicians

Provide appropriate antimicrobial and non-antimicrobial treatment for people with an infected diabetic foot ulcer. Initial antimicrobial treatment includes oral narrow-spectrum antibiotic therapy aimed at gram-positive organisms for up to 2 weeks.

For Health Services

Ensure that systems, processes, and resources are in place to support clinicians in treating people with a diabetic foot ulcer and local infection.

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Local infection

This is characterized as superficial or local to the skin and subcutaneous tissue.

Treatment

For local infection, treatment may include antimicrobial and non-antimicrobial (for example, debridement) interventions. Antimicrobial treatments are based on clinical assessment (signs and symptoms, severity, likely cause, and associated susceptibilities) and may be guided by properly conducted bacterial culture techniques. Initial treatment includes oral narrow-spectrum antibiotic therapy aimed at gram-positive organisms for up to 2 weeks.

Quality Indicators

Process Indicators

Percentage of people with a diabetic foot ulcer and a local infection who receive appropriate antimicrobial and non-antimicrobial treatment

- Denominator: number of people with a diabetic foot ulcer and a local infection
- Numerator: number of people in the denominator who receive appropriate antimicrobial and non-antimicrobial treatment
- Data source: local data collection

Percentage of people with a diabetic ulcer and a local infection who receive oral narrow-spectrum systemic antibiotic therapy aimed at gram-positive organisms for up to 2 weeks

- Denominator: number of people with a diabetic foot ulcer and a local infection
- Numerator: number of people in the denominator who receive oral narrow-spectrum systemic antibiotic therapy aimed at gram-positive organisms for up to 2 weeks
- Data source: local data collection

9

Deep/Surrounding Tissue Infection or Systemic Infection Management

People with a diabetic foot ulcer and a suspected deep/surrounding tissue infection or systemic infection receive urgent assessment (within 24 hours of initiation of care) and systemic antimicrobial treatment.

Background

People with diabetes are more susceptible to infection (over half will develop a skin and soft-tissue infection), and older individuals with diabetes may be at an even higher risk if they have comorbidities, which can mask the severity of the infection.[14,20] Deep/surrounding or systemic infection may be suspected when three or more of the following signs and symptoms are present: increased ulcer size; elevated temperature in the peri-wound; ability to probe to bone or the presence of exposed bone; new areas of tissue breakdown; presence of red tissue and swelling or edema; increased exudate; and foul odour.[21] Pain is also a sign of deep infection.

Sources: International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14]

What This Quality Statement Means

For Patients

If you have a suspected deep/surrounding tissue or systemic infection, you should have an urgent assessment within 24 hours and treatment with antibiotics.

For Clinicians

Carry out an assessment within 24 hours and provide systemic antimicrobial treatment for people with a diabetic foot ulcer and suspected deep/surrounding tissue infection or systemic infection.

For Health Services

Ensure that systems, processes, and resources are in place to support clinicians in treating people with a diabetic foot ulcer and suspected deep/surrounding tissue infection or systemic infection.

Quality Indicators

Process Indicators

Percentage of people with a diabetic foot ulcer and a suspected deep/surrounding tissue infection who receive an assessment within 24 hours of initiation of care

- Denominator: number of people with a diabetic foot ulcer and a suspected deep/surrounding tissue infection
- Numerator: number of people in the denominator who receive an assessment within 24 hours of initiation of care
- Data source: local data collection

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Deep/surrounding tissue infection

This is characterized as a deeper wound, such as an abscess, osteomyelitis, septic arthritis, or fasciitis.

Systemic infection

This is characterized as a local infection with signs of systemic inflammatory response syndrome.

Systemic antimicrobial treatment

This treatment includes:

- Broad-spectrum therapy aimed at gram-positive, gram-negative, and anaerobic organisms
- For osteomyelitis, 6 weeks of antibiotic therapy, which should be initiated based on clinical assessment and if the bone is not resected (1 week of therapy is generally sufficient if the bone is resected)

PROCESS INDICATORS CONTINUED

Percentage of people with a diabetic foot ulcer and a suspected systemic infection who receive an assessment within 24 hours of initiation of care

- Denominator: number of people with a diabetic foot ulcer and a suspected systemic infection
- Numerator: number of people in the denominator who receive an assessment within 24 hours of initiation of care
- Data source: local data collection

Percentage of people with a diabetic foot ulcer and a confirmed deep/surrounding tissue infection who receive systemic antimicrobial treatment

- Denominator: number of people with a diabetic foot ulcer and a confirmed deep/surrounding tissue infection
- Numerator: number of people in the denominator who receive systemic antimicrobial treatment
- Data source: local data collection

Percentage of people with a diabetic foot ulcer and a confirmed systemic infection who receive systemic antimicrobial treatment

- Denominator: number of people with a diabetic foot ulcer and a confirmed systemic infection
- Numerator: number of people in the denominator who receive systemic antimicrobial treatment
- Data source: local data collection

10

Wound Moisture Management

People with a diabetic foot ulcer receive wound care that maintains the appropriate moisture balance or moisture reduction in the wound bed.

Background

Wound care that maintains moisture balance to promote healing includes cleansing of the wound (tap water is usually sufficient) and selection of a dressing that promotes a moist wound healing environment (for healable ulcers) or moisture reduction (for maintenance ulcers and non-healable ulcers). Cleansing the wound promotes healing by supporting improved wound assessment, increased comfort when adherent dressings are removed, and the potential for rehydration of the wound.[15] There are many options for wound dressings. Selection of these products should be based on clinical assessment of the wound; patient preference; pain management considerations; and the ability to maintain a moist wound bed, control exudate, and avoid breakdown of the surrounding skin.[8,13,15]

Sources: Canadian Diabetes Association, 2013[11] | Commonwealth of Australia, 2011[12] | International Working Group on the Diabetic Foot, 2015[7] | National Institute for Health and Care Excellence, 2015[8] | Registered Nurses' Association of Ontario, 2013[14] | Society for Vascular Surgery, 2016[13]

What This Quality Statement Means

For Patients

Your health care team will determine whether your wound can heal or not. You should have a dressing that keeps the wound moist if it can heal, or dry if it cannot heal.

For Clinicians

For people with a diabetic foot ulcer, provide wound care that maintains the appropriate moisture balance or moisture reduction in the wound bed. A moist wound environment is appropriate for healable, non-ischemic ulcers. Moisture reduction is appropriate for maintenance, non-healable, and ischemic ulcers.

For Health Services

Ensure that systems, procedures (protocols), and resources are in place to support clinicians in providing wound care that maintains the appropriate moisture balance or moisture reduction in the wound bed.

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Moisture management

This is specific to the type of wound:

- Moisture balance and a moist wound environment for healable ulcers (ulcers that have adequate blood supply and can be healed if the underlying cause is addressed and treated)[15] and non-ischemic ulcers. Note: increased moisture is a sign of infection, which should be treated
- Moisture reduction for maintenance ulcers (ulcers that have healing potential, but barriers are present that may prevent healing, such as lack of access to appropriate treatment and poor adherence to treatment), non-healable ulcers (ulcers that are not likely to heal because of non-treatable causes or illnesses),[15] and ischemic ulcers

Quality Indicators

Process Indicators

Percentage of people with a healable diabetic foot ulcer who receive wound care that maintains the appropriate moisture balance in the wound bed and a moist wound environment

- Denominator: number of people with a healable diabetic foot ulcer
- Numerator: number of people in the denominator who receive wound care that maintains the appropriate moisture balance in the wound bed and a moist wound environment
- Data source: local data collection

Percentage of people with a maintenance or non-healable diabetic foot ulcer who receive wound care that maintains the appropriate moisture reduction in the wound bed

- Denominator: number of people with a maintenance or non-healable diabetic foot ulcer
- Numerator: number of people in the denominator who receive wound care that maintains the appropriate moisture reduction in the wound bed
- Data source: local data collection

11

Health Care Provider Training and Education

People who have developed or are at risk of developing a diabetic foot ulcer or foot complications receive care from health care providers with training and education in the assessment and management of diabetic foot ulcers and foot complications.

Background

People with a diabetic foot ulcer benefit from individualized care by health care professionals who have comprehensive training and education in diabetic foot ulcers and how to assess and manage them. Training and education materials or programs are additional to entry-level programs and should be tailored to providers' roles and responsibilities and the type of care they provide. This may range from screening and referral to the provision of ongoing wound care, pressure-redistribution devices, and working with an interprofessional team to conduct comprehensive assessments and interventional procedures.

Source: Registered Nurses' Association of Ontario, 2013[14]

What This Quality Statement Means

For Patients

You should receive care from a team of health care professionals who have been trained to care for people with diabetic foot ulcers or foot complications.

For Clinicians

Ensure that you have the training and education required to effectively provide care (including assessments, strategies for prevention, and treatments) for people who have developed or are at risk of developing a diabetic foot ulcer or foot complications, in accordance with your professional role.

For Health Services

Ensure that health care providers caring for people who have developed or are at risk of developing a diabetic foot ulcer or foot complications have training and education in how to carry out comprehensive assessments and provide appropriate treatments, including local wound care and pressure-redistribution devices.

Quality Indicators

Structural Indicator

Local availability of providers trained in the assessment and management of diabetic foot ulcers and foot complications

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Foot complications

These include factors that may lead to soft-tissue breakdown and ulceration, such as dry skin, callus, blister, deformities, minor fractures, and subacute Charcot arthropathy.

Provider training and education

These should include the following skills and information, at a minimum:

- Risk assessment (Quality Statement 1), comprehensive assessment (Quality Statement 4), and individualized care planning (Quality Statement 5)
- Techniques for providing effective patient education (Quality Statement 2)
- Local wound care, including debridement (Quality Statement 7), infection management (Quality Statements 8 and 9), and wound moisture management (Quality Statement 10)
- Pressure-redistribution devices (Quality Statement 6)

12

Transitions in Care

People with a diabetic foot ulcer or foot complications who transition between care settings have a team or provider who is accountable for coordination and communication to ensure the effective transfer of information related to their care.

Background

Transitions in care involve changes in providers or locations (within and between care settings)[23] and can increase the risk of errors and miscommunication related to a person's care. To support coordination and continuity of care, transition planning should be collaborative, involving the person with the diabetic foot ulcer, their family, and their caregiver(s), and incorporating their individual concerns and preferences. To support the transfer of accurate information, all providers must document the most up-to-date information in the individualized care plan. A provider or team should be accountable for ensuring the accurate and timely transfer of information on an ongoing basis to the proper recipients as part of seamless, coordinated transitions.

Source: Advisory committee consensus

What This Quality Statement Means

For Patients

When you change health care settings (for example, you return home after being cared for in a hospital), your health care team or health care professional should work with you to make sure that important information is transferred with you, and that you are connected to the supports you need.

For Clinicians

Ensure that people moving between providers or care settings have a person or team responsible for coordinating their care and transferring information.

For Health Services

Ensure that systems, processes, and resources are in place to enable smooth transitions between care settings for people with a diabetic foot ulcer or foot complications.

Quality Indicators

Process Indicators

Percentage of people with a diabetic foot ulcer who transition between care settings and have a team or provider who is accountable for coordination and communication to ensure the effective transfer of information related to their care

- Denominator: number of people with a diabetic foot ulcer who transition between care settings
- Numerator: number of people in the denominator who have a team or provider who is accountable for coordination and communication to ensure the effective transfer of information related to their care
- Data source: local data collection

DEFINITIONS USED WITHIN THIS QUALITY STATEMENT

Foot complications

These include factors that may lead to soft-tissue breakdown and ulceration, such as dry skin, callus, blister, deformities, minor fractures, and subacute Charcot arthropathy.

Team or provider

This is the provider or team of providers who have an ongoing role in the coordination and delivery of health care services for the person who has developed a diabetic foot ulcer or foot complications. Where possible, this should be a primary care provider or primary care team. Alternatively, an individual at the regional level who is responsible for care coordination could fill this role.

PROCESS INDICATORS CONTINUED

Percentage of people with a diabetic foot ulcer who transition between care settings and report that their team or provider knew about their medical history

- Denominator: number of people with a diabetic foot ulcer who transition between care settings and answer the question, “During your most recent visit, did this team or provider seem to know about your medical history?”
- Numerator: number of people in the denominator who answer “Yes”
- Data source: local data collection

Percentage of people with a diabetic foot ulcer who transition between care settings and report that there was good communication between their team and care providers

- Denominator: number of people with a diabetic foot ulcer who transition between care settings and answer the question, “Do you feel that there was good communication about your care between your team, doctors, nurses, and other staff?”
- Numerator: number of people in the denominator who answer “Usually” or “Always”
- Data source: local data collection

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About Health Quality Ontario

Health Quality Ontario is the provincial advisor on the quality of health care. We are motivated by a single-minded purpose: Better health for all Ontarians.

Who We Are

We are a scientifically rigorous group with diverse areas of expertise. We strive for complete objectivity, and look at things from a vantage point that allows us to see the forest and the trees. We work in partnership with health care providers and organizations across the system, and engage with patients themselves, to help initiate substantial and sustainable change to the province's complex health system.

What We Do

We define the meaning of quality as it pertains to health care, and provide strategic advice so all the parts of the system can improve. We also analyze virtually all aspects of Ontario's health care. This includes looking at the overall health of Ontarians, how well different areas of the system are working together, and most importantly, patient experience. We then produce comprehensive, objective reports based on data, facts and the voice of patients, caregivers, and those who work each day in the health system. As well, we make recommendations on how to improve care using the best evidence. Finally, we support large scale quality improvements by working with our partners to facilitate ways for health care providers to learn from each other and share innovative approaches.

Why It Matters

We recognize that, as a system, we have much to be proud of, but also that it often falls short of being the best it can be. Plus certain vulnerable segments of the population are not receiving acceptable levels of attention. Our intent at Health Quality Ontario is to continuously improve the quality of health care in this province regardless of who you are or where you live. We are driven by the desire to make the system better, and by the inarguable fact that better has no limit.

Quality Standards

Looking for more information?

Visit our website at **hqontario.ca** and contact us at **qualitystandards@hqontario.ca** if you have any questions or feedback about this guide.

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