

Understanding the measure 'Lower-limb amputations among people with diabetes'.

Indicator name (short)

Lower-limb amputations

Why this measure is important

A lower-limb amputation is undertaken because of a disease complication, usually a foot ulcer that is not healing because of issues associated with failure of the skin, biomechanics of the foot, sensory nerve loss or impaired blood supply. It can also be included in a medical amputation plan based on a decision between health care providers and the patient. Lower-limb amputations are ten times more likely among people with diabetes than among those without diabetes (Hoffstad et al 2015).

Lower-limb amputations are life altering and can lead to significant complications, poor quality of life, prolonged inpatient stays and high readmission rates (Liu et al 2021). In Aotearoa New Zealand, 13,562 lower limb amputations were undertaken between 2005 and 2016. Among these, 58 percent were attributable to diabetes. Notably, a substantial disparity was observed between Māori patients with diabetes and European/other patients with diabetes. Māori patients were 65 percent more likely to undergo major amputation (Gurney et al 2018).

Although the incidence of lower-limb amputation has decreased in many developed countries, including New Zealand, the prevalence of diabetes-related foot disease will continue to rise because of the increasing number of people developing type 2 diabetes and the increased survival rate. This will increase the future costs of managing diabetes, and the estimated cost per wound episode was \$NZ30,000 in New Zealand in 2016 (Daly et al 2020).

What 'good' looks like

A reduction in the number of lower-limb amputations and in the disparity among Māori is ideal. Such decreases can indicate better access to and continuity of services that support the management of the long-term complications associated with diabetes.

Potential causes of variation in this measure

Diabetes management is complex. Our health care system is oriented more towards acute care and is poorly equipped to meet chronic disease management needs. This requires a focus on primary and community care to deliver self-management support, patient engagement, team-based care and population management. A cohort study linking primary health and hospital records identified additional risk factors for lower-limb amputation: male sex, Māori ethnicity, economic deprivation, elevated glycated haemoglobin (HbA1c) and dyslipidaemia (Robinson et al 2016).

Diabetes management should also extend beyond glycaemic control. Optimal diabetes management requires control of not only blood glucose levels but also blood pressure and cholesterol, which is critical for the prevention of cardiovascular disease – the leading cause of mortality for those with diabetes. In addition, screening for early complications through annual eye and foot exams and lifestyle modifications, such as physical activity, dietary modification and smoking cessation, require extensive counselling and coordination. Without appropriate tracking, these items are likely to be missed.

Measures that influence outcomes

Measures that may directly influence or be impacted by lower-limb amputation are:

- diabetes prevalence in the population
- wait times for and access to diabetes annual reviews (proportion of patients with diabetes who complete annual reviews)
- rates of diabetic foot disease
- patient efficacy/confidence in diabetes self-management
- proportion of medical/surgical bed-days for people with diabetes.

What improves this measure

Symptom management and self-management support

A recent study identifying factors influencing hospitalisation rates in patients with diabetes demonstrated a significant reduction in short-term complications and uncontrolled diabetes among the population with diabetes (Di Martino et al 2021). Such reductions could be explained by improved outpatient diabetes care, drug and lifestyle interventions and personalised care.

Nurses providing community-based care are ideally placed to reduce the risk of people with diabetes developing foot disease. There exist opportunities for general practitioner clinics, diabetic outpatient services and kaupapa Māori providers to work together in localities to improve the accessibility and cultural responsiveness of services. Comprehensive foot examinations are essential for identifying patients with reduced sensation, peripheral vascular disease and early skin changes and for arranging appropriate follow-up referrals to reduce the risk of amputation. Nurses can also identify and intensify interventions for patients with risk factors for foot disease, elevated HbA1c, hypertension, dyslipidaemia, tobacco use, obesity and lack of physical activity.

Self-management supports – shared medical appointments (SMAs)

Shared medical appointments are a series of consecutive individual medical consultations in a supportive group where all can listen, interact and learn. An SMA is both a personal consultation and an informal group education session and is particularly useful in supporting diabetes self-management. Specifically, SMAs have been identified as a successful treatment modality, with patients with prediabetes experiencing more significant reductions in weight, HbA1c, cholesterol and systolic blood pressure (Papadakis et al 2021).

SMAAs provide the following advantages for patients.

- Group visits combat isolation and can remove doubt about one's ability to manage illness.
- Patients learn vicariously by witnessing others' illness experiences.
- Patients feel inspired by seeing others who are coping well.
- Patients receive professional expertise from the provider and first-hand information from peers, resulting in more robust health knowledge.
- Patients have the opportunity to see how the physicians interact with fellow patients, which allows them to get to know the physician and better determine their level of trust.
- The adequate time allotment compared with a regular scheduled appointment means patients feel supported.

For providers, SMAAs:

- develop more equitable relationships with patients
- support increased appreciation of and rapport with colleagues, leading to increased efficiency
- enable learning from patients to better meet their needs.

Read more on undertaking SMAAs in your practice [here](#).

Actively reviewing your enrolled patient roster

Using your patient management system to run queries on enrolled patients known to have diabetes is a significant first step in identifying those who may be at risk of complications. One of the first things you can query are patients known to have diabetes who have not visited your practice in the previous 12 months and therefore may have missed an annual review. Who are those patients, and are there any trends in the type of patient: are they older, younger, of a specific ethnicity; has it been a particular time since diagnosis; have they experienced recent hospitalisations or emergency department visits?

Once you have identified a group of patients who would most benefit from engaging with your services, work with your team to identify options to make that happen. Given the number of enrolled patients this affects, you might need to consider various options. This might mean you work with another provider in your community (example below), use SMAAs (examples above) and create specific options for accessing your nursing team, among others.

We believe that reviewing your enrolled patient roster periodically and ensuring your patient management system is up to date can dramatically increase your ability to be confident that your patients with diabetes are effectively managing their diabetes and that the risk of complications is minimised.

An improvement story

West Coast primary health organisation: improving access to care and the journey for Māori and whānau with diabetes

In 2018, Buller Health Medical Centre and Poutini Waiora focused on improving outcomes for Māori and Pacific patients with diabetes. The two organisations work together using a whānau ora model to improve access to care for people who are not engaging with the health system. This enables people who do not usually see health providers to receive services and supports their needs to help them manage their conditions and concerns.

To start, the organisations investigated their data and identified those with lower-than-target diabetes annual reviews (77 percent); of these, 35 percent had poor control, and Māori underwent fewer reviews and had higher rates of poor management.

Working together, the two providers offered weekly diabetes clinics where kaiarataki (health navigators) would check height, weight and blood pressure; undertake foot checks; and discuss what other supports would be helpful.

Together with the kaupapa Māori nurse, diabetes nurse and general practitioner as needed, the programme improved diabetes annual review forms, offered e-prescriptions and adapted resources to support improved literacy.

Through this multidisciplinary team approach, the programme enhanced relationships with Māori patients and communities, built trust and provided a wide range of wraparound supports to help Māori patients improve diabetes control.

HbA1c was an outcome measure in this project and showed some promise at the time of reporting, with more work underway to continue offering support and to scale-up the programme to achieve its desired outcomes.

Further information about this case study can be found [here](#).

Related resources

- [Health Pathways media release](#) on the updated type 2 diabetes pathway for the Te Manawa Taki (Midland) region covering Bay of Plenty, Lakes, Taranaki, Waikato and Hauora Tairāwhiti health localities.
- [He Ako Hiringa article](#) on the updated pathway for type 2 diabetes, which is endorsed by The Royal New Zealand College of General Practitioners and approved for up to 0.25 continuing medical education credits.
- [Glycaemic targets in the treatment of diabetes](#). Type 2 diabetes management guidelines from the New Zealand Ministry of Health and the New Zealand Society for the Study of Diabetes, 2020.

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