QUALITY STANDARDS

Type 1 Diabetes

Care for People of All Ages

Measurement Guide

April 2021

Ontario Health

Contents

1 How to Use the Measurement Guide

This document is meant to serve as a measurement guide to support the adoption of the Type 1 Diabetes Quality Standard. Care for people with type 1 diabetes is a critical issue and there are significant gaps and variations in the quality of care that people with type 1 diabetes receive in Ontario. Recognizing this, the Quality business unit at Ontario Health released this quality standard to identify opportunities that have a high potential for quality improvement.

This guide is intended for use by those looking to adopt the Type 1 Diabetes Quality Standard, including health care professionals working in regional or local roles.

This guide has dedicated sections for each of the two types of measurement within the quality standard:

- **Local measurement:** what you can do to assess the quality of care that you provide locally
- **Provincial measurement:** how we can measure the success of the quality standard on a provincial level using existing provincial data sources

Important Resources for Quality Standard Adoption

Ontario Health has created resources to assist with the adoption of quality standards:

- A *Getting Started Guide* that outlines a process for using quality standards as a resource to deliver high-quality care. It includes links to templates, tools and stories and advice from health care professionals, patients, and caregivers. You can use this guide to learn about evidence-based approaches to implementing changes to practice.
- A *Quality Improvement Guide* to give health care teams and organizations in Ontario easy access to well-established quality improvement tools. The guide provides examples of how to adapt and apply these tools to our Ontario health care environments.
- An online community called Quorum that is dedicated to working together to improve the quality of health care across Ontario. Quorum can support your quality improvement efforts.

2 Quality Indicators in Quality Standards

Quality standards inform providers and patients about what high-quality health care looks like for aspects of care that have been deemed a priority for quality improvement in the province. They are intended to guide quality improvement, monitoring, and evaluation.

Measurability is a key element in developing and describing the quality statements; each statement is accompanied by one or more indicators. This section describes the measurement principles behind the quality indicators, the process for developing these indicators and the technical definitions of the indicators.

An effective quality statement must be measurable. Measurement is necessary to demonstrate if a quality statement has been properly implemented and if it is improving care for patients. This is a key part of the Plan-Do-Study-Act improvement cycle. If measurement shows there has been no improvement, you need to consider a change or try something different.

2.1 Measurement Principles

Ontario Health uses the process, structure and outcome indicator framework developed by Donabedian in 1966 to develop indicators for quality standards. The three indicator types play essential and interrelated roles in measuring the quality of health care and the impact of introducing and using quality standards.

The indicators provided are merely suggestions. It is not expected that every provider, team, or organization will be able to measure all of them (or even want to measure all of them), but they can identify which indicators best capture areas of improvement for their care and what can be measured given existing local data sources.

2.2 Process Indicators

Process indicators assess the activities involved in providing care. They measure the percentage of individuals, episodes, or encounters for which an activity (process) is performed. In most cases, the numerator should specify a timeframe in which the action is to be performed, established through evidence or expert consensus. When a quality statement applies to a subset of individuals rather than the total population, the denominator should reflect the population of the appropriate subgroup, rather than the entire Ontario population. If exclusions are required or stratifications are suggested, they are reflected in the indicator specifications.

Process indicators are central to assessing whether or not the quality statement has been achieved; nearly all quality statements are associated with one or more process indicators. In most cases, the numerator and denominator for process indicators can be derived from the language of the quality statement itself; additional parameters (such as a timeframe) can also appear in the background and definitions sections. In some cases, a proxy indicator is provided that indirectly measures the process. Proxy indicators are used only when the actual indicator cannot be measured with currently available data.

While most quality statements focus on a single concept and are linked with a single process indicator, some statements include two or more closely related concepts. In these cases, multiple process indicators can be considered to capture all aspects of the quality statement. For example, a quality statement might suggest the need for a comprehensive assessment with several components and each of those components might have a process indicator.

Examples of process indicators include the percentage of patients with hip fracture who receive surgery within 48 hours or the percentage of patients with schizophrenia who are offered clozapine. Please refer to the published quality standards for more examples.

2.3 Structural Indicators

Structural indicators assess the structures and resources that influence and enable delivery of care. These can include equipment; systems of care; availability of resources; and teams, programs, policies, protocols, licences, or certifications. Structural indicators assess whether factors that are in place are known to help in achieving the quality statement.

Some quality statements have structural indicators associated with them. Structural indicators are binary or categorical and do not require the definition of a numerator and denominator. However, in some cases it could be useful to specify a denominator defining an organizational unit, such as a hospital, a primary care practice or a local region. In many cases data to measure structural indicators are not readily available using existing administrative data, so local data collection might be required. This local data collection might require regional or provincial level data collection systems to be developed.

Structural indicators should be defined for a quality statement or for the quality standard as a whole when there is strong evidence that a particular resource, capacity, or characteristic is important for enabling the effective delivery of a process of care. It should be theoretically feasible for these structural elements to be implemented across Ontario, even if adoption is aspirational in some cases. In rare instances, a quality statement might have two or more associated structural indicators, if the quality standard advisory committee decides that multiple factors are crucial to the delivery of the quality statement. Structural indicators should align with the Recommendations for Adoption, which outline gaps in resources in the province.

Examples of structural indicators include the availability of a stroke unit, the existence of discharge planning protocols or access to a specialized behavioural support team. Please refer to the published quality standards for more examples.

2.4 Outcome Indicators

Outcome indicators assess the end results of the care provided. They are crucial and are arguably the most meaningful measures to collect, but many health outcomes—such as mortality or unplanned hospital readmissions—are often the product of a variety of related factors and cannot be reliably attributed to a single process of care. For this reason, although relatively few quality statements are directly linked to an outcome indicator, a set of overall measures—including key outcome indicators—is defined for the quality standard as a whole, reflecting the combined effect of all of the quality statements in the quality standard. Similar to process indicators, outcome indicators should be specified using a defined denominator and a numerator that, in most cases, should include a clear timeframe.

Examples of outcome indicators include mortality rates, improvement (or decline) in function and patients’ experience of care. Please refer to the published quality standards for more examples.

2.5 Balancing Measures

Balancing measures indicate if there are important unintended adverse consequences in other parts of the system. Examples include staff satisfaction and workload. Although they are not the focus of the quality standard and generally not included in the quality standard, the intention of these types of measures is to monitor the unintended consequences.

3 Local Measurement

As part of the Type 1 Diabetes Quality Standard, *specific* indicators were identified for each of the statements to support measurement for quality improvement.

As an early step in your project, we suggest that your team complete an *initial assessment* of the relevant indicators in the quality standard and come up with a draft measurement plan.

Here are some concrete next steps:

- Review the list of identified indicators (See Appendix 2 in the quality standard) and determine which ones you will use as part of your adoption planning, given your knowledge of current gaps in care
- Determine the availability of data related to the indicators you have chosen
- Identify a way to collect local data related to your chosen indicators. This may be through clinical chart extraction or administration of local surveys, for example
- Develop a draft measurement plan

The earlier you complete the above steps, the more successful your quality improvement project is likely to be.

3.1 Local Data Collection

Local data collection refers to data collection at the health provider or team level for indicators that cannot be assessed using provincial administrative or survey databases (such as databases held by the Institute for Clinical Evaluative Sciences or the Canadian Institute for Health Information). Examples of local data include data from electronic medical records, clinical patient records, regional data collection systems and locally administered patient surveys. Indicators that require local data collection can signal an opportunity for local measurement, data advocacy or data quality improvement.

Local data collection has many strengths: it is timely, can be tailored to quality improvement initiatives and is modifiable on the basis of currently available data. However, caution is required when comparing indicators using local data collection between providers and over time to ensure consistency in definitions, consistency in calculation and validity across patient groups.

3.2 Measurement Principles for Local Data Collection

Three types of data can be used to construct measures in quality improvement: continuous, classification and count data. For all three types of data, it is important to consider clinical relevance when analyzing results (e.g., not every change is a clinically relevant change).

3.2.1 Continuous Data

Continuous data can take any numerical value in a range of possible values. These values can refer to a dimension, a physical attribute, or a calculated number. Examples include patient weight, number of calendar days and temperature.

3.2.2 Classification Data

Classification (or categorical) data are recorded in two or more categories or classes. Examples include sex, race or ethnicity and number of patients with depression versus number of patients without depression. In some cases, you might choose to convert continuous data into categories. For example, you could classify patient weight as underweight, normal weight, overweight or obese.

Classification data are often presented as percentages. To calculate a percentage from classification data, you need a numerator and a denominator (a percentage is calculated by dividing the numerator by the denominator and multiplying by 100). The numerator includes the number of observations meeting the criteria (e.g., number of patients with depression) and the denominator includes the total number of observations measured (e.g., total number of patients in clinic). Note that the observations in the numerator must also be included in the denominator (source population).

Examples of measures that use classification data include percentage of patients with a family physician and percentage of patients who receive therapy.

3.2.3 Count Data

Count data often focus on attributes that are unusual or undesirable. Examples include number of falls in a long-term care home and number of medication errors.

Count data are often presented as a rate, such as the number of events per 100 patient-days or per 1,000 doses. The numerator of a rate counts the number of events/nonconformities and the denominator counts the number of opportunities for an event. It is possible for the event to occur more than once per opportunity (e.g., a long-term care resident could fall more than once).

$$Rate\ of\ 30\text{-}day\ hospital\ readmission =$$

$$\frac{Number\ of\ hospital\ readmissions\ within\ 30\ days\ of\ discharge\ [\mathbf{numerator}]}{Number\ of\ discharges\ from\ hospital\ [\mathbf{denominator}]}$$

3.2.4 Benefits of Continuous Data

It is common practice in health care to measure toward a target instead of reporting continuous measures in their original form. An example would be measuring the number of patients who saw their primary care physician within 7 days of hospital discharge instead of measuring the number of days between hospital discharge and an appointment with a primary care physician. Targets should be evidence-based or based on a high degree of consensus across clinicians.

When a choice exists, continuous data sometimes are more useful than count or classification data for learning about the impact of changes tested. Measures based on continuous data are more responsive and can capture smaller changes than measures based on count data; therefore, it is easier and faster to see improvement with measures based on continuous data. This is especially true when the average value for the continuous measure is far from the target. Continuous data are also more sensitive to change. For example, while you might not increase the number of people who are seen within 7 days, you might reduce how long people wait.

3.3 Benchmarks and Targets

Benchmarks are markers of excellence to which organizations can aspire. Benchmarks should be evidence-based or based on a high degree of consensus across clinicians. At this time, Ontario Health does not develop benchmarks for the indicators. Users of these quality standards have variable practices, resources, and patient populations, so one benchmark might not be practical for the entire province.

Targets are goals for care that are often developed in the context of the local care environment. Providers, teams, and organizations are encouraged to develop their own targets appropriate to their patient populations, their current performance, and their quality improvement work. Organizations that include a quality standard indicator in their quality improvement plans are asked to use a target that reflects improvement. Timeframe targets, like the number of people seen within 7 days, are typically provided with process indicators intended to guide quality improvement.

In many cases, achieving 100% on an indicator is not possible. For example, someone might not receive care in a wait time benchmark due to patient unavailability. This is why it is important to track these indicators over time, to compare results against those of colleagues, to track progress and to aim for the successful implementation of the quality standard.

For guidance on setting benchmarks and targets at a local level, refer to:

- Approaches to Setting Targets for Quality Improvement Plans
- Long-Term Care Benchmarking Resource Guide

4 Provincial Measurement

In its quality standards, Ontario Health strives to incorporate measurement that is standardized, reliable and comparable across providers to assess the impact of the quality standards provincially. Where possible, indicators should be measurable using province-wide data sources. However, in many instances data are unavailable for indicator measurement. In these cases, the source is described as local data collection.

For more information on the data sources referenced in this quality standard, please see the **appendix.**

4.1 Accessing Provincially Measurable Data

Provincial platforms are available to users to create custom analyses to help you calculate results for identified measures of success. Examples of these platforms include IntelliHealth and eReports. Please refer to the links below to determine if you have access to the platforms listed.

4.1.1 IntelliHealth — Ministry of Health

IntelliHealth is a knowledge repository that contains clinical and administrative data collected from various sectors of the Ontario healthcare system. IntelliHealth enables users to create queries and run reports through easy web-based access to high quality, well organized, integrated data.

4.1.2 eReports — Canadian Institute for Health Information

Quick Reports offer at-a-glance comparisons for the organizations you choose. The tool also provides some ways to manipulate the pre-formatted look and feel of the reports. Flexible or Organization Reports offer you many choices to compare your organization's data with those of other organizations. With these customizable reports, you can view data by different attributes and for multiple organizations.

4.1.3 Applied Health Research Questions (AHRQ) — Institute for Clinical Evaluative Sciences

The Institute for Clinical Evaluative Sciences (ICES) receives funds from the Ministry of Health to provide research evidence to organizations from across the Ontario health care system (Knowledge Users). This knowledge is used to inform planning, policy, and program development. Knowledge Users can submit an Applied Health Research Question (AHRQ) to ICES. As a health services research institute that holds Ontario's administrative data, ICES is well positioned to respond to AHRQs that directly involve the use of ICES data holdings.

5 How Success Can Be Measured for This Quality Standard

This measurement guide accompanies Ontario Health's Type 1 Diabetes Quality Standard. Early in the development of each quality standard, a few performance indicators are chosen to measure the success of the entire quality standard. These indicators guide the development of the quality standard so that every statement within the quality standard aids in achieving the quality standard's overall goals.

This measurement guide includes information on the definitions and technical details of the indicators listed below:

Note: The indicators below are meant to apply to people with type 1 diabetes specifically; however, currently available data sources are limited in their ability to differentiate the types of diabetes. Exploratory work is currently under way to address this. For now, these measures include all people with diabetes.

- Percentage of people with diabetes who have had an urgent acute care visit for diabetes
    - Reported by:
        - Emergency department visits
        - Hospital admissions
- Percentage of people who had an urgent acute care visit for diabetes who visited the emergency department or were admitted to hospital for diabetes within 30 days
    - Reported by:
        - Emergency department visits
        - Hospital admissions
- Percentage of people with diabetes who have had a diabetes-related complication
    - Reported by:
        - Amputations (above-ankle, below-ankle)
        - Cardiovascular complications
        - End stage renal disease
        - Hyperglycemia, hypoglycemia, or ketoacidosis
        - Retinopathy
        - Skin and soft tissue infection or foot ulcer
- Percentage of people with diabetes who had at least two hemoglobin A1C tests in a 1-year period
- Percentage of people with diabetes whose most recent hemoglobin A1C value was less than or equal to:
    - 7.0% for people 18 years of age and older
    - 7.5% for people younger than 18 years of age
- Percentage of people with diabetes who have had an urgent acute care visit for a mental health disorder
    - Reported by:
        - Emergency department visits
        - Hospital admissions

- Percentage of people with type 1 diabetes and their families and caregivers (where appropriate) who report feeling confident in knowing how to take care of and manage their diabetes
- Percentage of people with type 1 diabetes who report that their interprofessional diabetes health care team always or often involves them in decisions about their care

This measurement guide includes data sources for indicators that can be consistently measured across providers, across the sectors of health care and across the province.

Indicators are categorized as:

- Provincially measurable (there are well defined and validated data sources) *or*
- Locally measurable (the indicator is not well defined and data sources do not currently exist to measure it consistently across providers and at the system level)

For more information on statement-specific indicators, please refer to the quality standard.

5.1 Quality Standard Scope

This quality standard addresses care for people of any age with a diagnosis of type 1 diabetes. It applies to all settings.

This quality standard does not include care for pregnant people with type 1 diabetes. For a quality standard that addresses care for people with type 1 or type 2 diabetes who become pregnant, or people diagnosed with gestational diabetes, please refer to the *Diabetes in Pregnancy* Quality Standard.

5.2 Cohort Identification

The Ontario Diabetes Database (ODD) is an Institute for Clinical Evaluative Sciences (ICES)-derived cohort that employs a validated algorithm to identify people with diabetes using data on hospitalizations, physician visits, and drug benefit claims.

Individuals were considered to have diabetes if they had at least:

- One hospital admission for diabetes (with a diagnostic code of diabetes: ICD-9-CA: 250 in any diagnostic code space; ICD-10-CA: E10, E11, E13, or E14 in any diagnostic code space) in the past year, or
- Two physician service claims for diabetes (with a diagnostic code for diabetes: Ontario Health Insurance Plan (OHIP) diagnostic code 250) in the past year, or
- One diabetes drug claim in the Ontario Drug Benefits (ODB) Database in the past year.

For individuals 18 years old or younger, the algorithm also considers OHIP fee codes for diabetes management, insulin therapy support, and diabetic management assessment codes (Q040, K029, K030, K045, K046). This case-definition algorithm has a sensitivity of 90% and a specificity of 97.7% for identifying diabetes in the population.

People enter the ODD as incident cases when they are defined as having diabetes (i.e., the first of DAD admission date or OHIP service date or ODB drug claim over the one-year period as incident rate). The ODD does not differentiate between Type 1 and Type 2 diabetes.

As well, when there was a hospital record with a diagnosis of pregnancy care or delivery close to a diabetic record (i.e., diabetes record date between 120 days before and 180 days after a gestational admission date), the diabetic record was considered to be for gestational diabetes and was excluded.

5.3 How Success Can Be Measured Provincially

The Type 1 Diabetes Quality Standard Advisory Committee identified a small number of overarching goals **for this quality standard.** These have been mapped to indicators that may be used to assess quality of care provincially. The following indicators are currently measurable in Ontario's health care system:

- Percentage of people with diabetes who have had an urgent acute care visit for diabetes
    - Reported by:
        - Emergency department visits
        - Hospital admissions
- Percentage of people who had an urgent acute care visit for diabetes who visited the emergency department or were admitted to hospital for diabetes within 30 days
    - Reported by:
        - Emergency department visits
        - Hospital admissions
- Percentage of people with diabetes who have had a diabetes-related complication
    - Reported by:
        - Amputations (above-ankle, below-ankle)
        - Cardiovascular complications
        - End stage renal disease
        - Hyperglycemia, hypoglycemia, or ketoacidosis
        - Retinopathy
        - Skin and soft tissue infection or foot ulcer
- Percentage of people with diabetes who had at least two hemoglobin A1C tests in a 1-year period
- Percentage of people with diabetes whose most recent hemoglobin A1C value was less than or equal to:
    - 7.0% for people 18 years of age and older
    - 7.5% for people younger than 18 years of age
- Percentage of people with diabetes who have had an urgent acute care visit for a mental health disorder
    - Reported by:
        - Emergency department visits
        - Hospital admissions

Methodologic details are described in the tables below.

Table 1: Percentage of people with diabetes who have had an urgent acute care visit for diabetes

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people with diabetes who have had an urgent acute care visit for diabetes - Reported by: • Emergency department visits • Hospital admissions Directionality: A lower rate is generally better. While not all unplanned emergency department visits or hospital admissions are avoidable, appropriate care in the community can be effective in reducing the need for an urgent acute care visit.
	Measurability	**Measurable at the provincial level**
	Dimension of quality	Effective
	Quality statement alignment	**Quality Statement 1: Diabetes Self-Management and Education** People with type 1 diabetes and their families and caregivers are offered an individualized, structured self-management education and support program at diagnosis and on an ongoing basis. **Quality Statement 2: Access to an Interprofessional Care Team** People with type 1 diabetes have access to an interprofessional diabetes health care team with training in type 1 diabetes. **Quality Statement 3: Setting and Achieving Glycemic Targets** People with type 1 diabetes, in collaboration with their health care team, set individualized glycemic targets, including glycated hemoglobin (hemoglobin A1C) and other available measures of glycemia. All available data are used to assess whether individualized glycemic targets are achieved and to guide treatment decisions and self-management activities. **Quality Statement 5: Transition from Pediatric to Adult Diabetes Care** People with type 1 diabetes experience planned, coordinated, and supported transitions from pediatric to adult diabetes care.
DEFINITION & SOURCE INFORMATION	Calculation: General	**Denominator** Total number of people with diabetes *Inclusions* All people with prevalent diabetes at the start of each fiscal year from 2016/17 to 2018/19 (e.g., diabetes patients that have a confirmed diagnosis in the ODD as of March 31 in the preceding fiscal year).

		Exclusions 1. Invalid IKN 2. Missing sex 3. Invalid age (age missing, age<0 or age>120) 4. Not an Ontario resident **Numerator** Number of people in the denominator who have had an urgent acute care visit for diabetes - Reported by: • Emergency department visits • Hospital admissions *Inclusions* At least one unscheduled/unplanned ED visit for diabetes (where diabetes is the main problem) in the year of interest for people with a diabetes diagnosis NACRS (ICD-10-CA) codes: E10-E14 At least one nonelective hospitalization for diabetes (where diabetes is the most responsible diagnosis) in the year of interest for people with a diabetes diagnosis DAD (ICD-10-CA) codes: E10-E14 *Exclusions* 1. Planned or scheduled ED visits 2. Planned or elective hospitalizations **Method** Numerator ÷ Denominator × 100 **Data source:** Discharge Abstract Database, National Ambulatory Care Reporting System, Ontario Diabetes Database, provided by the Institute for Clinical Evaluative Sciences
ADDITIONAL INFORMATION	Limitations	Currently available data sources are limited in their ability to differentiate between the various types of diabetes. Exploratory work has been undertaken to address this. In the data tables, the indicator results encompass both type 1 and type 2 diabetes. Regional variations of emergency department visits and hospitalizations may be linked to differences in the prevalence of diabetes across the regions and/or variations in care people with diabetes receive in the community.
	Comments	This indicator should be taken in conjunction with the other indicators to provide a full view of care provided to the patient.

		People with diabetes and their families have identified challenges affording out-of-pocket costs for medications, equipment, devices, and supplies required to treat their diabetes. These costs affect their adherence to their prescribed treatment regimens, which poses risks to their short- and long-term health. Young adults with type 1 diabetes without medical follow-up during the transition from pediatric to adult diabetes services are more likely to experience emergency department visits or hospitalizations during this period. The literature for the diabetes population typically reports ED visit or hospitalization data for any reason. As this indicator captures ED visits or hospitalizations for a set of diabetes-specific reasons, the data may not be comparable.

Abbreviations: ED (emergency department), ICD-10-CA (International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada), IKN (ICES number), NACRS (National Ambulatory Care Reporting System), ODD (Ontario Diabetes Database)

Table 2: Percentage of people who had an urgent acute care visit for diabetes who visited the emergency department or were admitted to hospital for diabetes within 30 days

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people who had an urgent acute care visit for diabetes who visited the emergency department or were admitted to hospital for diabetes within 30 days - Reported by: • Emergency department visits • Hospital admissions Directionality: A lower rate is generally better. While not all unplanned emergency department visits or hospitalizations are avoidable, appropriate care in the community can be effective in reducing the need for a hospital visit.
	Measurability	**Measurable at the provincial level**
	Dimension of quality	Effective
	Quality statement alignment	**Quality Statement 1: Diabetes Self-Management and Education** People with type 1 diabetes and their families and caregivers are offered an individualized, structured self-management education and support program at diagnosis and on an ongoing basis. **Quality Statement 2: Access to an Interprofessional Care Team** People with type 1 diabetes have access to an interprofessional diabetes health care team with training in type 1 diabetes. **Quality Statement 3: Setting and Achieving Glycemic Targets** People with type 1 diabetes, in collaboration with their health care team, set individualized glycemic targets, including glycated hemoglobin (hemoglobin A1C) and other available measures of glycemia. All available data are used to assess whether individualized glycemic targets are achieved and to guide treatment decisions and self-management activities. **Quality Statement 5: Transition from Pediatric to Adult Diabetes Care** People with type 1 diabetes experience planned, coordinated, and supported transitions from pediatric to adult diabetes care.
DEFINITION & SOURCE INFORMATION	Calculation: General	**Denominator** Total number of people who had an urgent acute care visit for diabetes - Reported by: • Emergency department visits • Hospital admissions

Inclusions

At least one unscheduled/unplanned ED visit for diabetes (where diabetes is the main problem) in the year of interest for people with a diabetes diagnosis

NACRS (ICD-10-CA) codes: E10-E14

At least one nonelective hospitalization for diabetes (where diabetes is the most responsible diagnosis) in the year of interest for people with a diabetes diagnosis

DAD (ICD-10-CA) codes: E10-E14

Exclusions

1. Planned or scheduled ED visits
2. Planned or elective hospitalizations
3. Invalid IKN
4. Missing sex
5. Invalid age (age missing, age<0 or age>120)
6. Not an Ontario resident

Numerator

Number of people in the denominator who visited the emergency department or were admitted to hospital for diabetes within 30 days

Inclusions

At least one unscheduled/unplanned ED visit for diabetes (where diabetes is the main problem) within 30 days of the initial visit for people with a diabetes diagnosis

NACRS (ICD-10-CA) codes: E10-E14

At least one nonelective hospitalization for diabetes (where diabetes is the most responsible diagnosis) within 30 days of the initial visit for people with a diabetes diagnosis

DAD (ICD-10-CA) codes: E10-E14

Exclusions

1. Planned or scheduled ED visits
2. Planned or elective hospitalizations

Method

Numerator ÷ Denominator × 100

Data source: Discharge Abstract Database, National Ambulatory Care Reporting System, provided by the Institute for Clinical Evaluative Sciences

ADDITIONAL INFORMATION	Limitations	Regional variations of emergency department visits and hospitalizations may be linked to differences in the prevalence of diabetes across the regions and/or variations in care people with diabetes receive in the community.
	Comments	This indicator should be taken in conjunction with the other indicators to provide a full view of care provided to the patient. People with diabetes and their families have identified challenges affording out-of-pocket costs for medications, equipment, devices, and supplies required to treat their diabetes. These costs affect their adherence to their prescribed treatment regimens, which poses risks to their short- and long-term health. Young adults with type 1 diabetes without medical follow-up during the transition from pediatric to adult diabetes services may be more likely to experience emergency department visits or hospitalizations during this period. The literature for the diabetes population typically reports ED visit or hospitalization data for any reason. As this indicator captures ED visits or hospitalizations for a set of diabetes-specific reasons, the data may not be comparable.

Abbreviations: ED (emergency department), ICD-10-CA (International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada), IKN (ICES number), NACRS (National Ambulatory Care Reporting System)

Table 3: Percentage of people with diabetes who have had a diabetes-related complication

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people with diabetes who have had a diabetes-related complication - Reported by: • Amputations (above-ankle, below-ankle) • Cardiovascular complications • End stage renal disease • Hyperglycemia, hypoglycemia, or ketoacidosis • Retinopathy • Skin and soft tissue infection or foot ulcer Directionality: A lower percentage is better
	Measurability	**Measurable at the provincial level**
	Dimension of quality	Effective
	Quality statement alignment	**Quality Statement 1: Diabetes Self-Management and Education** People with type 1 diabetes and their families and caregivers are offered an individualized, structured self-management education and support program at diagnosis and on an ongoing basis. **Quality Statement 2: Access to an Interprofessional Care Team** People with type 1 diabetes have access to an interprofessional diabetes health care team with training in type 1 diabetes. **Quality Statement 3: Setting and Achieving Glycemic Targets** People with type 1 diabetes, in collaboration with their health care team, set individualized glycemic targets, including glycated hemoglobin (hemoglobin A1C) and other available measures of glycemia. All available data are used to assess whether individualized glycemic targets are achieved and to guide treatment decisions and self-management activities. **Quality Statement 5: Transition from Pediatric to Adult Diabetes Care** People with type 1 diabetes experience planned, coordinated, and supported transitions from pediatric to adult diabetes care.
DEFINITION & SOURCE	Calculation: General	**Denominator** Total number of people with diabetes

		Inclusions All people with prevalent diabetes at the start of each fiscal year from 2016/17 to 2018/19 (e.g., diabetes patients that have a confirmed diagnosis in the ODD as of March 31 in the preceding fiscal year). *Exclusions* 1. Invalid IKN 2. Missing sex 3. Invalid age (age missing, age<0 or age>120) 4. Not an Ontario Resident **Numerator** Number of people in the denominator who have had a diabetes-related complication - Reported by: • Amputations (above-ankle, below-ankle) • Cardiovascular complications • End stage renal disease • Hyperglycemia, hypoglycemia, or ketoacidosis • Retinopathy • Skin and soft tissue infection or foot ulcer *Inclusions* Amputations (above-ankle, below-ankle) 1. Above-ankle procedure codes in CCI: 1VQ93, 1VC93, 1VG93 2. Below-ankle procedure codes in CCI: 1WA93, 1WE93, 1WI93, 1WJ93, 1WK93, 1WL93, 1WM93, 1WN93 3. Exclude if any of the following ICD-10-CA codes (any diagnosis type) appears on the same record: C402, C403, C461, C472, C492, D162, D163, D212, S74, S75, S76, S77, S78, S82, S84, S85, S86, S87, S88, S89, S97, S98, T0230, T0250, T0260, T0270, T0281, T0290, T033, T039, T043, T044, T047, T048, T049, T053, T054, T055, T056, T058, T059, T132, T133, T134, T135, T136, T138, T139, T1420, T1421, T143, T144, T145, T146, T147, T148, T149 Cardiovascular complications 1. Coronary Artery Disease Hospitalization (e.g., AMI) - DAD record with DXCODE or INCODE associated with AMI, PTCA, CABG or angina with most responsible diagnosis pre- or post-admission: a. ICD-10-CA codes: I20, I21, I22, DXTYPE1 = M b. CCI codes: 1IJ50, 1IJ57, 1IJ76 2. CVD hospitalization (e.g., stroke) a. ICD-10-CA codes: I61, I63, I64, G45 DXTYPE1=M

End stage renal disease

1. At least two chronic dialysis OHIP fee codes: G860 to G866

Hyperglycemia, hypoglycemia, or ketoacidosis

1. Hospitalizations for hyperglycemia or hypoglycemia based on DAD records with any of the following ICD-10-CA codes: E100, E101, E110, E111, E130, E131, E140, E141 (hyperglycemia with coma or acidosis); E15, E160, E161, E162, E1063, E1163, E1363, E1463 (hypoglycemia). Include all hospitalizations, whether the above diagnostic codes were specified as ‘most responsible diagnosis’ or not, as long as the diagnosis was present at the time of admission and not a complication during the hospital stay (dxtype=“M” or “1”). Include suspected cases as well.
2. ED visits based on NACRS records with any of the following ICD-10 -CAcodes listed as the main reason for coming to the ED (dxtype=‘Main’): E100, E101, E110, E111, E130, E131, E140, E141 (hyperglycemia with coma or acidosis); E15, E160, E161, E162, E1063, E1163, E1363, E1463 (hypoglycemia); R73802, R73812 (blood glucose >14mmol/L). Include all cases of varying severity (any CTAS level) and suspected cases.

Retinopathy

1. OHIP – at least one claim during the look forward period
   a. Laser photocoagulation – OHIP feecode: E154
   b. Vitrectomy – OHIP feecode: E148
   c. Intravitreal injection – OHIP feecode: E149

Skin and soft tissue infection or foot ulcer

1. Hospitalization for skin and soft tissue infection or foot ulcer, based on DAD records where any of the following ICD-10-CA codes were listed as the most responsible diagnosis (dxtype=‘M’): L00–L05, L08, M725, M726, A480, E1051, E1151, E1351, E1451, R02, E1061, E1161, E1361, E1461, E1070, E1071, E1171, E1371, E1471. Include all suspected cases.
2. ED visits based on NACRS records where any of the following ICD-10-CA codes were listed as the ‘main’ reason for coming to the ED (dxtype=Main’): L00–L05, L08, M725, M726, A480, E1051, E1151, E1351, E1451, R02, E1061, E1161, E1361, E1461, E1070, E1071, E1171, E1371, E1471. Include all cases of varying severity (any CTAS level) and suspected cases.

Method

Numerator ÷ Denominator × 100

Data source: Discharge Abstract Database, National Ambulatory Care Reporting System, Ontario Diabetes Database, Ontario Health Insurance Plan, provided by the Institute for Clinical Evaluative Sciences

ADDITIONAL INFORMATION	Limitations	Currently available data sources are limited in their ability to differentiate between the various types of diabetes. Exploratory work has been undertaken to address this. In the data tables, the indicator results encompass both type 1 and type 2 diabetes. The above list of diabetes-related complications is not exhaustive but includes common complications and risk factors in people with diabetes that can be present at diagnosis or develop over time. Other diabetes-related complications include abnormal sleep pattern and duration, dyslipidemia, erectile dysfunction, gum disease, hypertension, and neuropathy. Regional variations of diabetes-related complications may be linked to differences in the prevalence of diabetes across the regions and/or variations in care people with diabetes receive in the community.
	Comments	This indicator should be taken in conjunction with the other indicators to provide a full view of care provided to the patient. People with diabetes and their families have identified challenges affording out-of-pocket costs for medications, equipment, devices, and supplies required to treat their diabetes. These costs affect their adherence to their prescribed treatment regimens, which poses risks to their short- and long-term health. Young adults with type 1 diabetes without medical follow-up during the transition from pediatric to adult diabetes services may be more likely to experience diabetes-related complications during this period.

Abbreviations: AMI (acute myocardial infarction), CABG (coronary artery bypass grafting), CCI (Canadian Classification of Health Interventions), CTAS (Canadian Triage and Acuity Scale), ED (emergency department), ICD-10-CA (International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Canada), IKN (ICES number), NACRS (National Ambulatory Care Reporting System), ODD (Ontario Diabetes Database), OHIP (Ontario Health Insurance Plan), PTCA (percutaneous transluminal coronary angioplasty)

Table 4: Percentage of people with diabetes who had at least two hemoglobin A1C tests in a 1-year period

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people with diabetes who had at least two hemoglobin A1C tests in a 1-year period Directionality: A higher percentage is better
	Measurability	**Measurable at the provincial level**
	Dimension of quality	Effective
	Quality statement alignment	**Quality Statement 2: Access to an Interprofessional Care Team** People with type 1 diabetes have access to an interprofessional diabetes health care team with training in type 1 diabetes. **Quality Statement 3: Setting and Achieving Glycemic Targets** People with type 1 diabetes, in collaboration with their health care team, set individualized glycemic targets, including glycated hemoglobin (hemoglobin A1C) and other available measures of glycemia. All available data are used to assess whether individualized glycemic targets are achieved and to guide treatment decisions and self-management activities.
DEFINITION & SOURCE INFORMATION	Calculation: General	**Denominator** Total number of people with diabetes *Inclusions* All people with prevalent diabetes at the start of each fiscal year from 2016/17 to 2018/19 (e.g., diabetes patients that have a confirmed diagnosis in the ODD as of March 31 in the preceding fiscal year). *Exclusions* 1. Invalid IKN 2. Missing sex 3. Invalid age (age missing, age<0 or age>120) 4. Not an Ontario Resident **Numerator** Number of people in the denominator who had at least two hemoglobin A1C tests in a 1-year period

		Inclusions OHIP fee code: L093 Number of people with at least two hemoglobin A1C tests recorded in OLIS using LOINC observation codes: 17855-8, 17856-6, 41995-2, 4548-4, 59261-8, 71875-9 **Method** Numerator ÷ Denominator × 100 **Data source:** Ontario Diabetes Database, Ontario Laboratory Information System, provided by the Institute for Clinical Evaluative Sciences
ADDITIONAL INFORMATION	Limitations	Currently available data sources are limited in their ability to differentiate between the various types of diabetes. Exploratory work has been undertaken to address this. In the data tables, the indicator results encompass both type 1 and type 2 diabetes.
	Comments	People with diabetes are at risk of developing serious, acute complications (e.g., severe hypoglycemia, ketoacidosis); long-term microvascular complications affecting the eyes, kidneys, and nerves); and cardiovascular disease. Frequent monitoring of glucose levels, lifelong insulin administration via injection or an insulin pump to keep blood glucose levels in the target range are essential for managing diabetes and reducing the risk of acute and chronic complications. Each measure of glycemia has benefits and limitations; therefore, use of all available measuring of glycemia—hemoglobin A1C, in conjunction with regular home glucose monitoring (e.g., fingerstick blood glucose measurements, continuous glucose monitoring, flash glucose monitoring)—provides important information to assess glycemic status and optimize diabetes management.

Abbreviations: IKN (ICES numbers), LOINC (Logical Observation Identifiers Names and Codes), ODD (Ontario Diabetes Database), OHIP (Ontario Health Insurance Plan), OLIS (Ontario Laboratories Information System)

Table 5: Percentage of people with diabetes whose most recent hemoglobin A1C value was less than or equal to (1) 7.0% for people 18 years of age and older or (2) 7.5% for people younger than 18 years of age

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people with diabetes whose most recent hemoglobin A1C value was less than or equal to: • 7.0% for people 18 years of age and older • 7.5% for people younger than 18 years of age Directionality: A higher percentage is better
	Measurability	**Measurable at the provincial level**
	Dimension of quality	Effective
	Quality statement alignment	**Quality Statement 2: Access to an Interprofessional Care Team** People with type 1 diabetes have access to an interprofessional diabetes health care team with training in type 1 diabetes. **Quality Statement 3: Setting and Achieving Glycemic Targets** People with type 1 diabetes, in collaboration with their health care team, set individualized glycemic targets, including glycated hemoglobin (hemoglobin A1C) and other available measures of glycemia. All available data are used to assess whether individualized glycemic targets are achieved and to guide treatment decisions and self-management activities. **Quality Statement 5: Transition from Pediatric to Adult Diabetes Care** People with type 1 diabetes experience planned, coordinated, and supported transitions from pediatric to adult diabetes care.
DEFINITION & SOURCE INFORMATION	Calculation: General	**Denominator** Total number of people with diabetes who have had a hemoglobin A1C test *Inclusions* All people with prevalent diabetes at the start of each fiscal year from 2016/17 to 2018/19 (e.g., diabetes patients that have a confirmed diagnosis in the ODD as of March 31 in the preceding fiscal year). OHIP fee code: L093 Number of people with at least one hemoglobin A1C test recorded in OLIS using LOINC observation codes: 17855-8, 17856-6, 41995-2, 4548-4, 59261-8, 71875-9

		Exclusions 1. Invalid IKN 2. Missing sex 3. Invalid age (age missing, age<0, or age>120) 4. Not an Ontario Resident **Numerator** Number of people in the denominator whose most recent hemoglobin A1C value was less than or equal to: • 7.0% for people 18 years of age and older • 7.5% for people younger than 18 years of age **Method** Numerator ÷ Denominator × 100 **Data source:** Ontario Diabetes Database, Ontario Laboratory Information System, provided by the Institute for Clinical Evaluative Sciences
ADDITIONAL INFORMATION	Limitations	Currently available data sources are limited in their ability to differentiate between the various types of diabetes. Exploratory work has been undertaken to address this. In the data tables, the indicator results encompass both type 1 and type 2 diabetes.
	Comments	People with diabetes are at risk of developing serious, acute complications (e.g., severe hypoglycemia, ketoacidosis); long-term microvascular complications affecting the eyes, kidneys, and nerves); and cardiovascular disease. Frequent monitoring of glucose levels, lifelong insulin administration via injection or an insulin pump to keep blood glucose levels in the target range are essential for managing diabetes and reducing the risk of acute and chronic complications. Each measure of glycemia has benefits and limitations; therefore, use of all available measuring of glycemia—hemoglobin A1C, in conjunction with regular home glucose monitoring (e.g., fingerstick blood glucose measurements, continuous glucose monitoring, flash glucose monitoring)—provides important information to assess glycemic status and optimize diabetes management.

Abbreviations: IKN (ICES numbers), LOINC (Logical Observation Identifiers Names and Codes), ODD (Ontario Diabetes Database), OHIP (Ontario Health Insurance Plan), OLIS (Ontario Laboratories Information System)

Table 6: Percentage of people with diabetes who had an urgent acute care visit for a mental health disorder

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people with diabetes who have had an urgent acute care visit for a mental health disorder - Reported by: • Emergency department visits • Hospital admissions Directionality: A lower rate is generally better. While not all unplanned emergency department visits or hospitalizations are avoidable, appropriate care in the community can be effective in reducing the need for a hospital visit.
	Measurability	**Measurable at the provincial level**
	Dimension of quality	Effective
	Quality statement alignment	**All statements align with this indicator**
DEFINITION & SOURCE INFORMATION	Calculation: General	**Denominator** Total number of people with diabetes *Inclusions* All people with prevalent diabetes at the start of each fiscal year from 2016/17 to 2018/19 (e.g., diabetes patients that have a confirmed diagnosis in the ODD as of March 31 in the preceding fiscal year). *Exclusions* 1. Invalid IKN 2. Missing sex 3. Invalid age (age missing, age<0 or age>120) 4. Not an Ontario Resident **Numerator** Number of people in the denominator who have had an urgent acute care visit for a mental health disorder - Reported by: • Emergency department visits • Hospital admissions

		Inclusions At least one unscheduled/unplanned ED visit for a mental health disorder (where a mental health disorder is the main problem) for people with a diabetes diagnosis NACRS (ICD-10-CA): F04-F99, X60-X84, Y10-Y19, Y28 OMHRS: All records except those with AXIS1_DSM4CODE_DISCH1 or DSM5CODE_DISCH1 equal to 290.x or 294.x At least one nonelective hospitalization for a mental health disorder (where a mental health disorder is the most responsible diagnosis) for people with a diabetes diagnosis DAD (ICD-10-CA): F04-F99, X60-X84, Y10-Y19, Y28 OMHRS: All records except those with AXIS1_DSM4CODE_DISCH1 or DSM5CODE_DISCH1 equal to 290.x or 294.x *Exclusions* 1. Planned or scheduled ED visits 2. Planned or elective hospitalizations **Method** Numerator ÷ Denominator × 100 **Data source:** Discharge Abstract Database, National Ambulatory Care Reporting System, Ontario Diabetes Database, Ontario Mental Health Reporting System, provided by the Institute for Clinical Evaluative Sciences
ADDITIONAL INFORMATION	Limitations	Currently available data sources are limited in their ability to differentiate between the various types of diabetes. Exploratory work has been undertaken to address this. In the data tables, the indicator results encompass both type 1 and type 2 diabetes. Regional variations of emergency department visits and hospitalizations may be linked to differences in the prevalence of diabetes across the regions and/or variations in care people with diabetes receive in the community.
	Comments	This indicator should be taken in conjunction with the other indicators to provide a full view of care provided to the patient. People with diabetes and their families have identified challenges affording out-of-pocket costs for medications, equipment, devices, and supplies required to treat their diabetes. These costs affect their adherence to their prescribed treatment regimens, which poses risks to their short- and long-term health.

		Young adults with type 1 diabetes without medical follow-up during the transition from pediatric to adult diabetes services may be more likely to experience emergency department visits or hospitalizations during this period.

Abbreviations: DAD (Discharge Abstract Database), IKN (ICES number), NACRS (National Ambulatory Care Reporting System), ODD (Ontario Diabetes Database), OMHRS (Ontario Mental Health Reporting System)

5.4 How Success Can Be Measured Locally

You might want to assess the quality of care you provide to your patients with type 1 diabetes. You might also want to monitor your own quality improvement efforts. It can be possible to do this using your own clinical records or you might need to collect additional data. We recommend the following list of potential indicators, some of which cannot be measured provincially using currently available data:

- Percentage of people with type 1 diabetes and their families and caregivers (where appropriate) who report feeling confident in knowing how to take care of and manage their diabetes
- Percentage of people with type 1 diabetes who report that their interprofessional diabetes health care team always or often involves them in decisions about their care

Methodologic details are described in the tables below.

Table 7: Percentage of people with type 1 diabetes and their families and caregivers (where appropriate) who report feeling confident in knowing how to take care of and manage their diabetes

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people with type 1 diabetes and their families and caregivers (where appropriate) who report feeling confident in knowing how to take care of and manage their diabetes Directionality: A higher percentage is better
	Measurability	**Not measurable at the provincial level**
	Dimension of quality	Patient-centred
	Quality statement alignment	**All statements align with this indicator**
DEFINITION & SOURCE INFORMATION	Calculation: General	**Denominator** Total number of people with type 1 diabetes and their families and caregivers (where appropriate) **Numerator** Number of people in the denominator who report feeling confident in knowing how to take care of and manage their diabetes **Data source:** N/A
ADDITIONAL INFORMATION	Limitations	N/A
	Comments	In addition to diabetes self-management education and support programs, people with type 1 diabetes, and their families and caregivers as appropriate, should have prompt and convenient access to diabetes-related advice from their interprofessional diabetes health care team by telephone, text message, or email and in person between visits to manage urgent matters. There are many validated tools for measuring patient experience in people with diabetes. An example of a survey that may be used as a resource for this indicator is the Patient Assessment of Chronic Illness Care (PACIC) (Glasgow, 2005).

Table 8: Percentage of people with type 1 diabetes who report that their interprofessional diabetes health care team always or often involves them in decisions about their care

GENERAL DESCRIPTION	Indicator description	Name: Percentage of people with type 1 diabetes who report that their interprofessional diabetes health care team always or often involves them in decisions about their care Directionality: A higher percentage is better
	Measurability	**Not measurable at the provincial level**
	Dimension of quality	Patient-centred
	Quality statement alignment	**Quality Statement 2: Access to an Interprofessional Care Team** People with type 1 diabetes have access to an interprofessional diabetes health care team with training in type 1 diabetes.
DEFINITION & SOURCE INFORMATION	Calculation: General	**Denominator** Total number of people with type 1 diabetes **Numerator** Number of people in the denominator who report that their interprofessional diabetes health care team always or often involves them in decisions about their care **Data source:** N/A
ADDITIONAL INFORMATION	Limitations	N/A
	Comments	Pediatric and adult interprofessional diabetes health care teams made up of providers with specific training in and experience with type 1 diabetes can effectively provide person-centred, high-quality diabetes care, education, and support for people with diabetes and their families and caregivers. This collaborative, coordinated care approach should begin at diagnosis. There are many validated tools for measuring patient experience in people with diabetes. An example of a survey that may be used as a resource for this indicator is the Patient Assessment of Chronic Illness Care (PACIC) (Glasgow, 2005).

6 Resources and Questions

6.1 Resources

Several resources are available for more information:

- The **quality standard** provides information on the background, definitions of terminology, numerators, and denominators for all statement-specific indicators
- The ***Getting Started Guide*** includes quality improvement tools and resources for health care professionals, including an action plan template
- The **Case for Improvement deck** provides data on why a particular quality standard has been created and the data behind it
- The **data tables** provide data that can be used to examine variations in indicator results across the province

6.2 Questions?

Please contact qualitystandards@ontariohealth.ca. We would be happy to provide advice on measuring quality standard indicators or put you in touch with other providers who have implemented the quality standards and might have faced similar questions.

Ontario Health offers an online community dedicated to improving the quality of health care across Ontario together called Quorum. Quorum can support your quality improvement work by allowing you to:

- Find and connect with others working to improve health care quality
- Identify opportunities to collaborate
- Stay informed with the latest quality improvement news
- Give and receive support from the community
- Share what works and what doesn’t
- See details of completed quality improvement projects
- Learn about training opportunities
- Join a community of practice

7 Appendix: Data Sources Referenced in This Quality Standard

Within this quality standard, there are several data sources used for provincial measurement. The data source(s) for each indicator are listed within the individual indicator specifications. More details on the specific data sources that Ontario Health used to produce the indicators are noted below.

Discharge Abstract Database — Canadian Institute for Health Information
The Discharge Abstract Database by the Canadian Institute for Health Information contains information abstracted from hospital records that capture administrative, clinical, and patient demographic data on all hospital in-patient separations, including discharges, deaths, sign-outs, and transfers. The institute receives Ontario data directly from participating facilities, from their respective regional health authorities or from the Ministry of Health. The database includes patient-level data for acute care facilities in Ontario. Data are collected, maintained, and validated by the institute.

The main data elements of this database are patient identifiers (e.g., name, health card number), patient demographics (e.g., age, sex, geographic location), clinical information (e.g., diagnoses, procedures) and administrative information.

National Ambulatory Care Reporting System — Canadian Institute for Health Information
The National Ambulatory Care Reporting System by the Canadian Institute for Health Information contains data for all hospital- and community-based emergency and ambulatory care, including day surgeries, outpatient clinics and emergency departments. Data are collected, maintained, and validated by the institute. The institute receives Ontario data directly from participating facilities, from their respective regional health authorities or from the Ministry of Health. Data are collected, maintained, and validated by the institute.

The main data elements of this database are patient identifiers (e.g., name, health card number), patient demographics (e.g., age, sex, geographic location), clinical information (e.g., diagnoses, procedures) and administrative information.

Ontario Diabetes Database — Institute for Clinical Evaluative Sciences
The ODD is an Institute for Clinical Evaluative Sciences (ICES)-derived cohort that employs a validated algorithm to identify people with diabetes using data on hospitalizations, physician visits, and drug benefit claims. Hospital discharge abstracts data, collected by the Canadian Institute for Health Information (CIHI) from April 1988 onwards, were used to identify Ontarians with a valid health card number who had been hospitalized with a new or pre-existing diagnosis of diabetes. Physician claim records held by the Ontario Health Insurance Plan (OHIP) from July 1991 onwards were also used to identify individuals with visits to a physician for diabetes. The Ontario Drug Benefit (ODB) claims database, which captures medications dispensed to Ontario residents eligible for the Ontario Drug Benefit Program (people aged 65 years and older, residents of long-term care facilities, recipients of professional home and community care services, people receiving social assistance, and beneficiaries of specialized drug programs) since April 1990, was used to identify dispensations for insulin and other oral anti-glycemics used to treat diabetes.

Individuals were considered to have diabetes if they had at least:

- One hospital admission for diabetes (with a diagnostic code of diabetes: ICD-9-CA: 250 in any diagnostic code space; ICD-10-CA: E10, E11, E13, or E14 in any diagnostic code space) in the past year, or
- Two physician service claims for diabetes (with a diagnostic code for diabetes: OHIP diagnostic code 250) in the past year, or
- One diabetes drug claim in the ODB in the past year.

For individuals 18 years old or younger, the algorithm also considers OHIP fee codes for diabetes management, insulin therapy support, and diabetic management assessment codes (Q040, K029, K030, K045, K046). This case-definition algorithm has a sensitivity of 90% and a specificity of 97.7% for identifying diabetes in the population.

People enter the ODD as incident cases when they are defined as having diabetes (i.e., the first of DAD admission date or OHIP service date or ODB drug claim over the one-year period as incident rate). The ODD does not differentiate between Type 1 and Type 2 diabetes.

As well, when there was a hospital record with a diagnosis of pregnancy care or delivery close to a diabetic record (i.e., diabetes record date between 120 days before and 180 days after a gestational admission date), the diabetic record was considered to be for gestational diabetes and was excluded.

Ontario Health Insurance Plan — Ministry of Health

The Ontario Health Insurance Plan (OHIP) claims database covers all reimbursement claims to the ministry made by fee-for-service physicians, community-based laboratories and radiology facilities. The OHIP database at the Institute for Clinical Evaluative Sciences contains encrypted patient and physician identifiers, codes for services provided, dates of service, associated diagnoses and fees paid. Services missing from OHIP data include some laboratory services, services received in provincial psychiatric hospitals, services provided by health service organizations and other alternative providers, diagnostic procedures performed on an in-patient basis, and laboratory services performed at hospitals (both in-patient and same day). Also excluded is remuneration to physicians through alternative funding plans; this could distort analyses because of their concentration in certain specialties or geographic areas.

Ontario Laboratories Information System — Ministry of Health

The Ontario Laboratories Information System (OLIS) is an information repository that gives authorized health care providers access to lab test orders and results from hospitals, community labs and public health labs. As patients move between hospitals, family physicians, home care and long-term care settings, OLIS makes viewing patients' current and past test results easier and enables treatment decisions to be made at the point-of-care. The OLIS standard ensures all information technology systems that retrieve lab data from OLIS can exchange and understand the content through standardized HL7 messages and terminologies. The OLIS standard was created by the Ontario Ministry of Health and Long-Term Care in consultation with experts from hospital, community and public health laboratories, the Ontario Medical Association, vendors of laboratory information systems and electronic medical record systems, in addition to a range of other stakeholders.

Ontario Mental Health Reporting System — Canadian Institute for Health Information
The OMHRS, housed at the Canadian Institute for Health Information, collects information about individuals admitted to designated adult mental health beds in Ontario. The OMHRS includes information on admissions and discharges as well as clinical information. Clinical data are collected using the Resident Assessment Instrument for Mental Health (RAI-MH), a standardized assessment instrument for inpatient mental health care. It includes information about mental and physical health, social support, and service use. Data are collected on clients from participating hospitals in Ontario at admission, discharge and every three months for patients with extended stays. The number of active OMHRS sites has varied between 65 and 74 since the start of OMHRS in 2005/06. In the early years of OMHRS, between 90% and 98% of active sites submitted at least some data every quarter. This rate has increased to 100% for all 4 quarters of 2014/15. As of May 15, 2017, there were 84 participating facilities that have submitted data at least once to the OMHRS database since the implementation of the OMHRS in October 2005.

QUALITY STANDARDS

Looking for more information?

Visit hqontario.ca or contact us at qualitystandards@ontariohealth.ca if you have any questions or feedback about this measurement guide.

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