

# Quality Standards

## Vaginal Birth After Caesarean

Care for People Who Have Had a Caesarean Birth and Are Planning Their Next Birth

### Measurement Guide

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**Health Quality  
Ontario**

*Let's make our health system healthier*

 **Ontario**  
Health Quality Ontario

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# 1 How to Use the Measurement Guide

This document is meant to serve as a measurement guide to support adoption of the quality standard *Vaginal Birth After Caesarean* (VBAC). The primary goals of this quality standard are to improve access to safe vaginal birth after Caesarean delivery and promote informed shared decision-making. Most people who have a Caesarean birth can safely have a VBAC; however, Ontario's VBAC rates have decreased over time. Recognizing this trend, Health Quality Ontario released this quality standard to identify opportunities that have good potential for quality improvement.

This guide is intended for use by those looking to adopt the 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

## Important Resources for Quality Standard Adoption

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

- A [Getting Started Guide](#) 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](#) gives 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 health care in Ontario
- An online community called [Quorum](#) 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 principle 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 determine 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

Health Quality Ontario 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 related roles in measuring the quality of health care and the impact of introducing and using quality standards.

The indicators provided are suggestions intended to support quality improvement efforts. 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). These materials can be used as a reference to identify which indicators best capture areas of improved 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 people, 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 using evidence or expert consensus. When a quality statement applies to a subset of people 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, for example, to assess the equitable delivery of care, they are reflected in the indicator specifications.

Process indicators are central to assessing whether or not the quality statement has been followed; 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 definitions section.

While most quality statements should focus on a single concept and be 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 there could be a process indicator for each of those components.

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 after first- and second-line antipsychotics have been ineffective. 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 are in place that are known to be important for 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 could be required. This local data collection could require development of region- or province-level data collection systems.

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 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 or expert panel decides that multiple factors are crucial to the delivery of the quality statement.

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 and reflects 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. In some cases, a proxy indicator is provided that indirectly measures the outcome of interest. Proxy indicators are used only when the actual indicator is not measurable using currently available data.

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 assess important unintended adverse consequences of a change in process to other parts of the system. Examples include staff satisfaction and workload. Balance measures will be embedded throughout the standard. While they are not the focus of the standard, the intention is to monitor the unintended consequences of changes in care.

## 3 Local Measurement

As part of the quality standard *Vaginal Birth After Caesarean*, *specific* measures 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 measures in the standard and come up with a draft measurement plan.

Here are some concrete next steps:

- Review the list of identified measures (in the quality standard) and determine which measures 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 measures you have chosen.
- Identify how you will collect local data related to your chosen measures.
- 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 collected by the health provider or team for indicators that cannot be assessed using provincial administrative databases (such as databases held by the Institute for Clinical Evaluative Sciences or the Canadian Institute for Health Information). Examples include data from electronic medical records, clinical patient records, regional data collection systems, or locally administered patient surveys. Indicators that require local data collection can signal an opportunity for local measurement, data advocacy, or improvement.

Local data collection has many strengths: it is timely, can be tailored to quality improvement initiatives, and can be easily modified to include currently available data. However, when comparing indicators that use locally collected data between providers, it is critical to ensure consistency in data collection, definitions, 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.

#### 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 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-day hospital readmission =*

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

### 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 for learning about the impact of changes tested than count or classification data. Measures based on continuous data are more responsive and can capture smaller changes than measures based on count or classification 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 away from the target. Continuous data also are more sensitive to changes. For example, while you might not increase the number of people who are seen within 7 days, you might reduce the average time that people wait.

## 3.3 Benchmarks and Targets

Benchmarks are markers of excellence to which organizations can aspire. Benchmarks should be based on evidence or on a high degree of consensus among clinicians. At this time, Health Quality Ontario does not develop benchmarks specifically for quality standards indicators. Users of these 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 based on their patient populations and their quality improvement work. Organizations that include a quality standard indicator in their quality improvement plans are requested 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 impossible. This is why it is important to track these indicators over time, and potentially to compare performance with that of colleagues, to set targets, to track progress, and to aim for successful implementation of the standard.

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

- [Approaches to Setting Targets for Quality Improvement Plans](#)
- [Long-Term Care Benchmarking Resource Guide](#)

## 4 Provincial Measurement

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

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

Provincial platforms are available to create custom analyses to help you calculate results for identified measures of success. Examples of these platforms include IntelliHealth, eReports, and Query.

### 4.1 IntelliHealth—Ministry of Health and Long-Term Care

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

### 4.2 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.

### 4.3 Query—Public Health Ontario

“Query is a dynamic tool that allows public health professionals to instantly explore, manipulate, and analyze health data using pre-defined reports and variables.” Query tools are available for reportable infectious disease data (ID Query) and health care–associated infection data (HAI Query).

## 5 How Success Can Be Measured for This Quality Standard

This measurement guide accompanies Health Quality Ontario's quality standard *Vaginal Birth After Caesarean*. Early in the development of each quality standard, a small number of performance indicators are chosen to measure the success of the entire standard. These indicators guide the development of the quality standard so that every statement within the standard aids in achieving the standard's overall goals. This guide includes information on the definitions and technical details of the overall measure of success listed below, including data sources for indicators that can be consistently measured across providers, across the sectors of health care, and across the province. For more information on the statement-specific indicators, please refer to the quality standard.

List of indicators:

- Percentage of eligible pregnant people who plan VBAC
- Percentage of eligible pregnant people who deliver successfully via VBAC
- Rate of uterine rupture per 1,000 planned VBACs
- Percentage of neonates who remain in the neonatal intensive care unit for longer than 4 hours among infants born to people who planned VBAC versus those born to people who planned elective repeat Caesarean section
- Rate of neonatal morbidity and mortality among infants born to people who planned VBAC compared with those who planned an elective repeat Caesarean section

Indicators are categorized as:

- Provincially measurable (the indicator is well defined and validated); 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).

### 5.1 Quality Standard Scope

The scope of this quality standard extends from postpartum counselling after a Caesarean birth through antenatal and intrapartum care during the next pregnancy and birth.

Guidance in this quality standard on pregnancy care focuses on people with a previous Caesarean birth who are pregnant with one baby that is head-down and at full term (> 37 weeks), who are receiving pregnancy care from any type of health care professional. People with more than one previous Caesarean birth are included in the scope; however research evidence is limited for this population. Careful individualized assessment and clinical judgment as part of shared decision-making are essential in this situation.

This standard does not apply to people who have the following contraindications to VBAC:

- Previous classical or inverted "T" uterine scar
- Previous hysterotomy or myomectomy entering the uterine cavity
- Previous uterine rupture
- Placenta accreta
- Placenta increta

- Placenta percreta
- Placenta previa
- Any other maternal or fetal complication that is a contraindication to vaginal birth

## 5.2 Cohort Identification

People who are planning VBAC or who are eligible for VBAC can be captured through data collected by the Better Outcomes and Registry Network (BORN).

## 5.3 How Success Can Be Measured Provincially

The Vaginal Birth After Caesarean Quality Standard Expert Panel identified several overarching goals for this quality standard. These have been mapped to indicators that can be used to assess quality of care provincially. The following indicators are provincially measurable in Ontario:

- Percentage of eligible pregnant people who plan VBAC
- Percentage of eligible pregnant people who deliver successfully via VBAC
- Rate of uterine rupture per 1,000 planned VBACs
- Percentage of neonates who remain in the neonatal intensive care unit for longer than 4 hours among infants born to people who planned VBAC compared with infants born to people who planned elective repeat Caesarean section
- Rate of neonatal morbidity and mortality among infants born to people who planned VBAC compared with infants born to people who planned an elective repeat Caesarean section

Methodologic details are described in the tables below.

Table 1: Percentage of Eligible Pregnant People Who Plan a VBAC

GENERAL DESCRIPTION	Indicator description	Percentage of eligible pregnant people who plan a VBAC  Directionality: A higher rate is better
	Indicator status	<b>Measurable at the provincial level</b>
	Dimensions of quality	Effective, patient-centred
DEFINITION & SOURCE INFORMATION	Calculation	<p><b>Denominator</b> Number of pregnant people eligible for VBAC</p> <p><i>Inclusions</i></p> <ul style="list-style-type: none"> <li>• Pregnant people in Robson group 5</li> <li>• Multiparous</li> <li>• Singleton gestation with cephalic presentation</li> <li>• Gestational age <math>\geq</math> 37 wk</li> <li>• Have at least one previous Caesarean section</li> <li>• Births occurring in any setting (home birth, hospital birth, or birth centre)</li> </ul> <p><i>Exclusions</i></p> <ul style="list-style-type: none"> <li>• Previous classical or inverted “T” uterine scar</li> <li>• Previous hysterotomy or myomectomy entering the uterine cavity</li> <li>• Previous uterine rupture</li> <li>• Placenta accreta</li> <li>• Placenta increta</li> <li>• Placenta percreta</li> <li>• Placenta previa</li> <li>• Any other maternal or fetal complication that is a contraindication to vaginal birth</li> </ul> <p><b>Numerator</b> Number of pregnant people who planned a vaginal delivery</p> <p><b>Method</b> Numerator/Denominator * 100</p> <p><b>Data source:</b> BORN</p>
GEOGRAPHY & TIMING	Levels of comparability	Overall province, LHIN, patient characteristics

ADDITIONAL INFORMATION	Limitations	Depending on the year of data being analyzed, BORN data could be incomplete
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Abbreviations: BORN, Better Outcomes Research Network; LHIN, local health integration network; VBAC, vaginal birth after Caesarean section.

Table 2: Percentage of Eligible Pregnant People Who Have a Successful VBAC

GENERAL DESCRIPTION	Indicator description	Percentage of eligible pregnant people who have a successful VBAC Directionality: A higher rate is better
	Indicator status	<b>Measurable at the provincial level</b>
	Dimensions of quality	Effective
DEFINITION & SOURCE INFORMATION	Calculation	<p><b>Denominator</b> Number of pregnant people eligible for VBAC</p> <p><i>Inclusions</i></p> <ul style="list-style-type: none"> <li>• Pregnant people in Robson group 5</li> <li>• Multiparous</li> <li>• Singleton gestation with cephalic presentation</li> <li>• Gestational age <math>\geq 37</math> wk</li> <li>• Have at least one previous Caesarean section</li> <li>• Births occurring in any setting (home, hospital, or birth centre)</li> </ul> <p><i>Exclusions</i></p> <ul style="list-style-type: none"> <li>• Previous classical or inverted “T” uterine scar</li> <li>• Previous hysterotomy or myomectomy entering the uterine cavity</li> <li>• Previous uterine rupture</li> <li>• Placenta accreta</li> <li>• Placenta increta</li> <li>• Placenta percreta</li> <li>• Placenta previa</li> <li>• Any other maternal or fetal complication that is a contraindication to vaginal birth</li> </ul> <p><b>Numerator</b> Number of pregnant people who successfully delivered vaginally (live birth)</p> <p><b>Inclusions</b> Pregnant people who were eligible for VBAC and had a vaginal birth</p> <p><b>Method</b> <math>\text{Numerator} \div \text{Denominator} \times 100</math></p> <p><b>Data source:</b> BORN</p>
GEOGRAPHY & TIMING	Levels of comparability	Overall province, LHIN, patient characteristics

ADDITIONAL INFORMATION	Limitations	Depending on year of data being analyzed, BORN data might be incomplete
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Abbreviations: BORN, Better Outcomes Research Network; LHIN, local health integration network; VBAC, vaginal birth after Caesarean section.

Table 3: Rate of Uterine Rupture per 1,000 Planned VBACs

GENERAL DESCRIPTION	Indicator description	Rate of uterine rupture per 1,000 planned VBACs  Directionality: A lower rate is better
	<b>Indicator status</b>	<b>Measurable at the provincial level</b>
	Dimensions of quality	Safety
DEFINITION & SOURCE INFORMATION	Calculation	<p><b>Denominator</b> Number of pregnant people who planned vaginal delivery (includes pregnant people who were eligible for VBAC and had a vaginal birth or unplanned Caesarean section)</p> <p><b>Numerator</b> Number of pregnant people who planned VBAC and who had a uterine rupture</p> <p><i>Inclusions</i> Number of pregnant people who planned VBAC and met the following conditions:</p> <ul style="list-style-type: none"> <li>• Labour and birth complication = uterine rupture</li> <li>• All indicators for Caesarean section = maternal/uterine rupture</li> </ul> <p><b>Method</b> Numerator ÷ Denominator × 1,000</p> <p><b>Data source:</b> BORN</p>
GEOGRAPHY & TIMING	Levels of comparability	Overall province, LHIN, patient characteristics
ADDITIONAL INFORMATION	Limitations	Depending on year of data being analyzed, BORN data might be incomplete
	Comments	

Abbreviations: BORN, Better Outcomes Research Network; LHIN, local health integration network; VBAC, vaginal birth after Caesarean section.

Table 4: Percentage of Neonates who Remained in Neonatal Intensive Care for > 4 h Among Infants Born to People who Planned VBAC Compared with Infants Born to People who Planned Elective Repeat Caesarean Section

GENERAL DESCRIPTION	Indicator description	Percentage of neonates who remained in neonatal intensive care for > 4 h among infants born to people who planned VBAC compared with infants born to people who planned elective repeat Caesarean section  Directionality: A lower rate is better
	<b>Indicator status</b>	<b>Measurable at the provincial level</b>
	Dimensions of quality	Safety
DEFINITION & SOURCE INFORMATION	Calculation	<p><b>Denominator</b></p> <ul style="list-style-type: none"> <li>Number of pregnant people in Robson group 5 who planned vaginal delivery (includes pregnant people who were eligible for VBAC and had vaginal birth or unplanned Caesarean section)</li> <li>Number of pregnant people in Robson group 5 who planned elective repeat Caesarean section (includes pregnant people who were eligible for VBAC and had Caesarean section or who planned Caesarean section)</li> </ul> <p><b>Numerator</b></p> <ul style="list-style-type: none"> <li>Number of neonates whose first NICU length of stay &gt; 4 h, born to people who planned VBAC (includes neonates born to people who were eligible for VBAC and had vaginal birth or unplanned Caesarean section)</li> <li>Number of neonates whose first NICU length of stay &gt; 4 h, born to people who planned elective repeat Caesarean section (includes neonates born to people who were eligible for VBAC and had Caesarean section or who planned Caesarean section)</li> </ul> <p><b>Method</b> Numerator ÷ Denominator × 100</p> <p><b>Data source:</b> BORN</p>
GEOGRAPHY & TIMING	Levels of comparability	Overall province, LHIN, patient characteristics
ADDITIONAL INFORMATION	Limitations	Depending on the year of data being analyzed, BORN data could be incomplete
	Comments	

Abbreviations: BORN, Better Outcomes Research Network; LHIN, local health integration network; NICU; Neonatal Intensive Care Unit; VBAC, vaginal birth after Caesarean section.

Table 5: Rate of Neonatal Morbidity and Mortality Among Infants Born to People Who Planned VBAC Compared With Infants Born to People Who Planned Elective Repeat Caesarean Section

<b>GENERAL DESCRIPTION</b>	Indicator description	Rate of neonatal morbidity and mortality among infants born to people who planned VBAC compared with infants born to people who planned an elective repeat Caesarean section Directionality: A lower rate is better
	<b>Indicator status</b>	<b>Measurable at the provincial level</b>
	Dimensions of quality	Safety
<b>DEFINITION &amp; SOURCE INFORMATION</b>	Calculation	<p><b>Denominator</b></p> <ul style="list-style-type: none"> <li>• Number of neonates born to people who planned VBAC (includes neonates born to people eligible for VBAC who had vaginal birth or unplanned Caesarean section)</li> <li>• Number of neonates born to people who planned elective repeat Caesarean section (includes neonates born to people eligible for VBAC who had Caesarean section or who planned Caesarean section)</li> </ul> <p><b>Numerator</b> Number of neonates who died, had respiratory problems, or had seizures born to people who planned Caesarean section</p> <p><i>Inclusions</i></p> <ul style="list-style-type: none"> <li>• Neonates born to people eligible for VBAC and had vaginal birth or unplanned Caesarean section)</li> <li>• Neonates who met any of the following conditions:             <ul style="list-style-type: none"> <li>- Neonatal death</li> <li>- Newborn resuscitation (first 30 minutes of life only):</li> <li>- FFO<sub>2</sub></li> <li>- CPAP + air</li> <li>- CPAP + O<sub>2</sub></li> <li>- PPV + air</li> <li>- PPV + O<sub>2</sub></li> <li>- LMA</li> <li>- Intubation for tracheal suction</li> <li>- Intubation for PPV</li> <li>- Chest compression</li> <li>- Epinephrine</li> <li>- Volume expander</li> <li>- Unknown</li> <li>- Mechanical ventilation days ≥ 1</li> <li>- Seizure</li> </ul> </li> </ul> <p>Number of neonates who died, had respiratory problems, or had seizures who were born to people who planned elective repeat Caesarean section</p>

		<p><b>Inclusions</b></p> <ul style="list-style-type: none"> <li>• Neonates born to people eligible for VBAC who had Caesarean section or who planned Caesarean section</li> <li>• Neonates who met any of the following conditions: <ul style="list-style-type: none"> <li>- Neonatal death</li> <li>- Newborn resuscitation (first 30 minutes of life only): <ul style="list-style-type: none"> <li>- FFO<sub>2</sub></li> <li>- CPAP + air</li> <li>- CPAP + O<sub>2</sub></li> <li>- PPV + air</li> <li>- PPV + O<sub>2</sub></li> <li>- LMA</li> <li>- Intubation for tracheal suction</li> <li>- Intubation for PPV</li> <li>- Chest compression</li> <li>- Epinephrine</li> <li>- Volume expander</li> <li>- Unknown</li> <li>- Mechanical ventilation days ≥ 1</li> <li>- Seizure</li> </ul> </li> </ul> </li> </ul> <p><b>Method</b>  Numerator ÷ Denominator × 100</p> <p><b>Data Source</b>  BORN</p>
GEOGRAPHY AND TIMING	Levels of Comparability	Overall province, LHIN, patient characteristics
ADDITIONAL INFORMATION	Limitations	Depending on the year of data being analyzed, BORN data could be incomplete

Abbreviations: BORN, Better Outcomes Research Network; CPAP, continuous positive airway pressure; FFO<sub>2</sub>, oxygen; LHIN, local health integration network; LMA, laryngeal mask airway; NICU; neonatal intensive care unit; PPV, positive pressure ventilation; VBAC, vaginal birth after Caesarean section.

## 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 **infobrief** 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@hgontario.ca](mailto:qualitystandards@hgontario.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 standards and might have faced similar questions.

Health Quality Ontario 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 Source Referenced in This Quality Standard

Within this quality standard, data from the BORN Ontario information system was used for provincial measurement. The data source for each indicator is listed within individual indicator specifications. More details on the BORN information system that Health Quality Ontario used to produce the indicators is noted below.

### **Better Outcomes Registry & Network (BORN)**

The BORN information system is Ontario's pregnancy, birth, and early childhood registry and network. Established in 2009 to collect and share data about each child born in the province, BORN Ontario manages an advanced database (BORN Information System) that provides reliable, secure, and comprehensive information on maternal and child care. The BORN Information System enables the collection of, and access to, clinical data on every birth and young child in Ontario. It is a province-wide, web-based system in which data on mothers and babies are directly entered either by care providers or by data entry clerks, or are extracted and uploaded by a hospital's electronic patient record. As of November 2009, all hospitals in the province with a mother and newborn program were contributing birth data.

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