

# Health Quality Ontario

*Let's make our health system healthier*

## **Hospital Performance Series:** **Pre-operative testing before low-risk surgeries**

*For Sample Hospital*

In partnership with:



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# Report Overview

## Background

Physicians and other leaders in the hospital sector have developed Choosing Wisely Canada recommendations to avoid routine pre-operative testing for asymptomatic patients undergoing low-risk surgery. [1-3]

There is no evidence that routine pre-operative electrocardiography (ECG) and chest radiography (X-ray) testing in asymptomatic patients undergoing elective low-risk surgeries improves outcomes. [4-6] In fact, routine testing may lead to further unnecessary downstream testing, cancellation of surgery, and increased patient anxiety and cost. [7-9] Despite this, in 2014/15, pre-operative ECG and chest X-rays were frequently performed for patients who underwent low-risk surgeries and there was nearly a 30-fold difference between hospitals with the lowest and highest rates of pre-operative ECG tests before low-risk surgeries, highlighting opportunities for quality improvement. [10]

## Who is this report for?

Hospital's administrators, physicians, nurses and decision support/quality improvement specialists.

## What indicators are included in this report?

This report includes the percentage of low-risk surgeries tested with an ECG or chest X-ray within 60 days prior to the eligible low-risk surgeries (endoscopy, ophthalmologic surgery, and other low-risk surgeries, such as hip/knee arthroscopy and hernia repair). Adult patients (aged 18 and older) who were admitted to either outpatient day surgery or acute in-patient settings for those selected low-risk surgeries are included.

See Methods Notes section on [pg. 14](#) for more detailed information about the methodology and other important data considerations.

## How to use this report

- **My Dashboard:** Your hospital's fiscal year 2016/17 performance at-a-glance.
- **My Hospital's Performance:** Trend-over-time data and variation in rates among hospitals for each indicator.
- **Change Ideas:** Best practices and potential change ideas to support quality improvement.
- **Methods Notes:** Detailed information about the methodology and important interpretation notes.

For hospital corporations with more than one site performing the selected low-risk surgeries, detailed data at the corporation level and for the specific hospital sites can be found in the corporation report.

# My Dashboard

My Hospital Name: Sample Hospital

## My hospital's performance in fiscal year (FY) 2016/17

✘ My Hospital   ● Ontario

Percentage of endoscopy cases with pre-operative...



Percentage of ophthalmologic surgery cases with pre-operative...



Percentage of other low-risk surgery cases with pre-operative...



† Data suppressed; numerator and/or denominator is between 1 to 5  
 § No selected low-risk surgery within the reporting period  
 \* Unstable rate, please interpret with caution; denominator is between 6 and 29

How many surgeries were done in FY2016/17 in my hospital?

### Endoscopy Procedures

1,684

### Ophthalmologic Surgeries

14

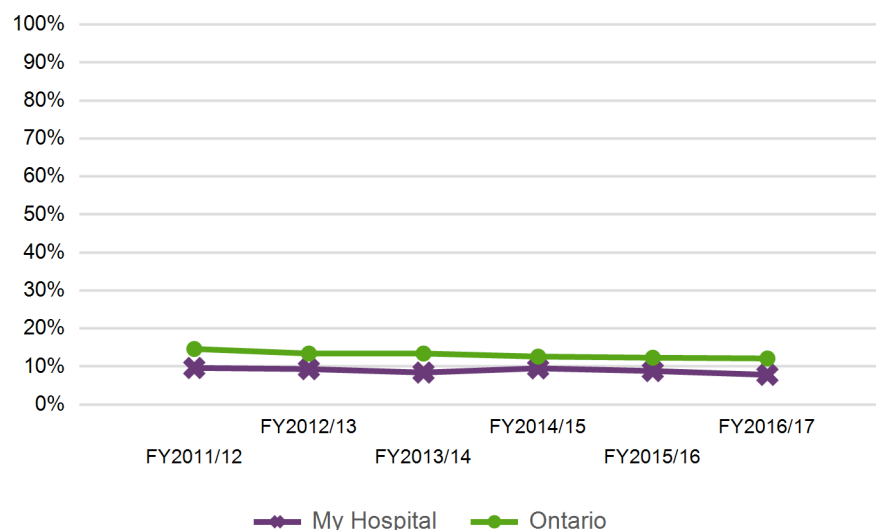
### Other Low-risk Surgeries

1,063

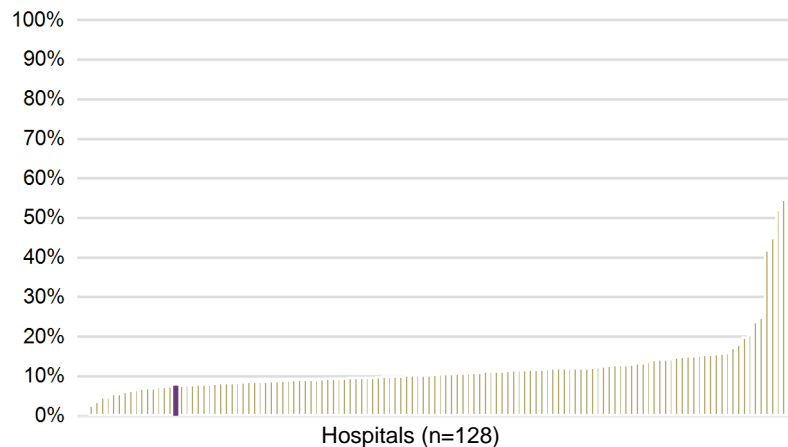
Data sources: Discharge Abstract Database (DAD), National Ambulatory Care Reporting System (NACRS), Ontario Health Insurance Plan (OHIP) Claims History Database and Registered Persons Database (RPDB), provided by the Institute for Clinical Evaluative Sciences (ICES).

# My Hospital's Performance: ECG Test before Endoscopy Procedure

Percentage of endoscopy cases with pre-operative ECG, from FY2011/12 to FY2016/17



How did my hospital compare with others in FY2016/17?



Note: This graph and the analysis included in the table below do not include hospitals with suppressed data or hospitals without low-risk surgeries within the reporting period.

Period	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17
My Hospital	9.6%	9.3%	8.4%	9.5%	8.8%	7.8%
Ontario	14.6%	13.4%	13.4%	12.6%	12.3%	12.1%

	FY2016/17
My Hospital (Purple)	7.8%
Minimum value	0.0%*
25th percentile	8.9%
Median	10.7%
75th percentile	13.1%
Maximum value	65.3%

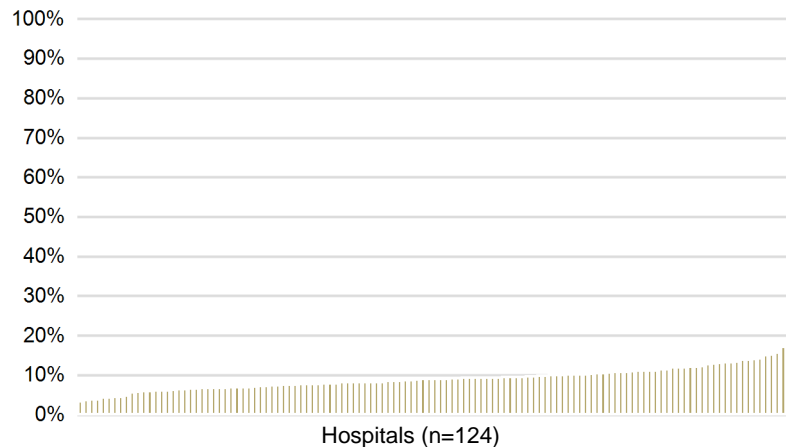
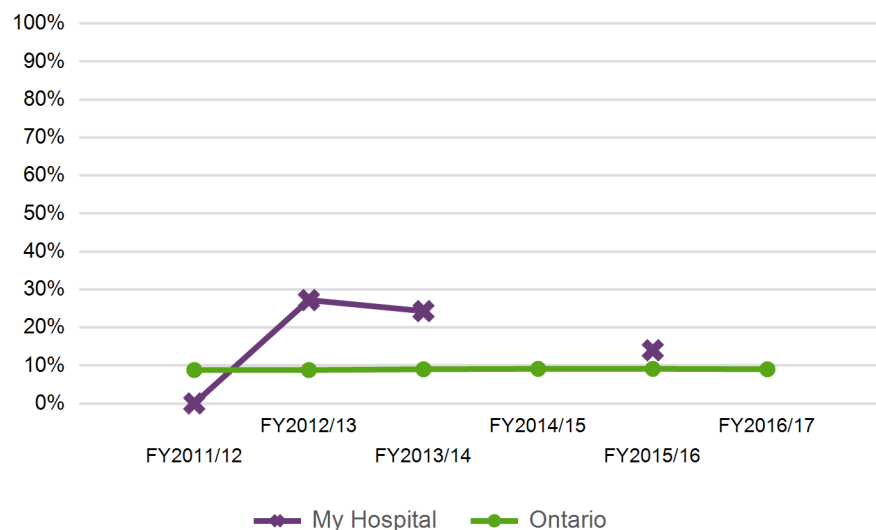
\* Unstable rate, please interpret with caution; denominator is between 6 and 29

## Key Findings

In FY2016/17, 131 pre-operative ECG tests were conducted before 1,684 endoscopy procedures in my hospital. My hospital's rate was 7.8% in FY2016/17, which is lower than the provincial rate of 12.1%. For the same time period, the rates ranged from 0.0%\* to 65.3% across Ontario hospitals that performed these procedures.

# My Hospital's Performance: Chest X-ray before Endoscopy Procedure

Percentage of endoscopy cases with pre-operative chest X-ray, from FY2011/12 to FY2016/17 How did my hospital compare with others in FY2016/17?



Note: This graph and the analysis included in the table below do not include hospitals with suppressed data or hospitals without low-risk surgeries within the reporting period.

Period	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17
My Hospital	0.0%*	27.2%	24.3%	§	14.0%	§
Ontario	8.8%	8.8%	9.0%	9.1%	9.1%	9.0%

	FY2016/17
My Hospital (Purple)	§
Minimum value	3.7%
25th percentile	7.5%
Median	9.4%
75th percentile	11.1%
Maximum value	22.0%

§ No selected low-risk surgery within the reporting period

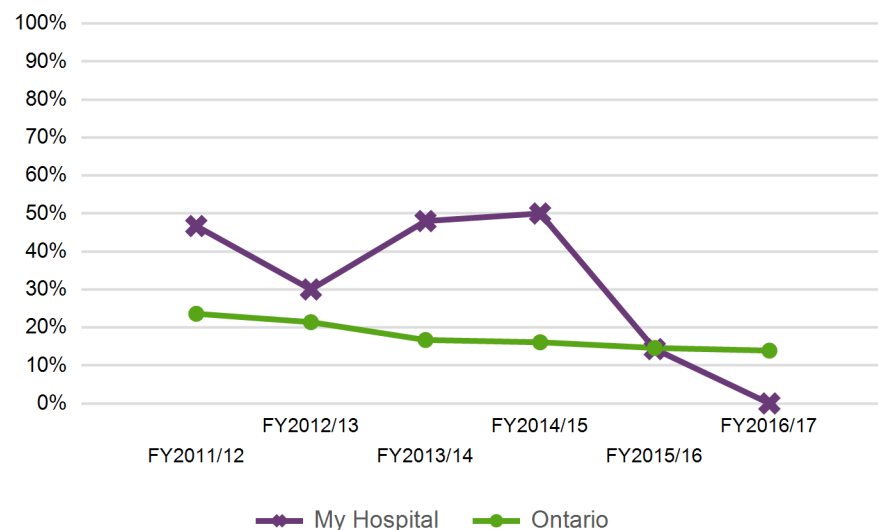
\* Unstable rate, please interpret with caution; denominator is between 6 and 29

## Key Findings

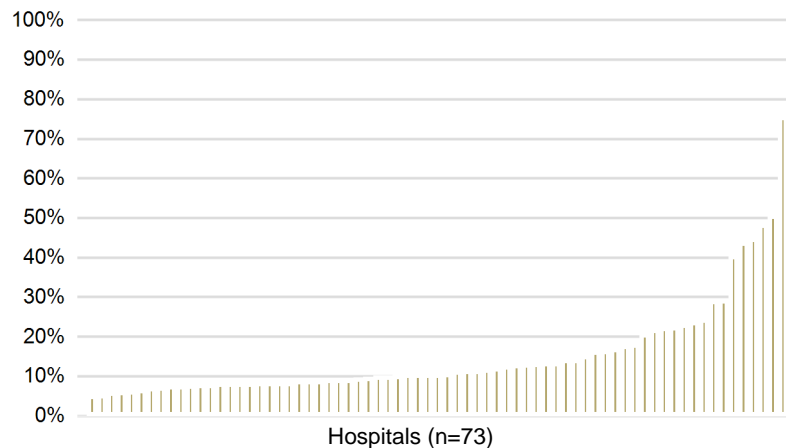
In FY2016/17, data has been suppressed or no endoscopy procedures were performed. The provincial rate in FY2016/17 is 9.0%. For the same time period, the rates ranged from 3.7% to 22.0% across Ontario hospitals that performed these procedures.

# My Hospital's Performance: ECG Test before Ophthalmologic Surgery

Percentage of ophthalmologic surgery cases with pre-operative ECG, from FY2011/12 to FY2016/17



How did my hospital compare with others in FY2016/17?



Note: This graph and the analysis included in the table below do not include hospitals with suppressed data or hospitals without low-risk surgeries within the reporting period.

Period	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17
My Hospital	46.7%*	30.0%*	48.0%*	50.0%	14.3%	0.0%*
Ontario	23.6%	21.4%	16.7%	16.1%	14.6%	13.9%

	FY2016/17
My Hospital (Purple)	0.0%*
Minimum value	0.0%*
25th percentile	8.5%
Median	10.7%
75th percentile	17.2%
Maximum value	90.6%

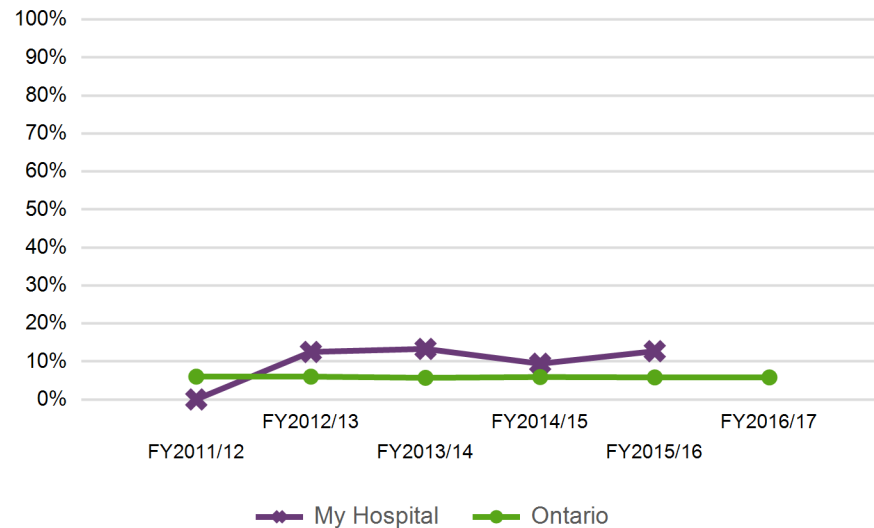
\* Unstable rate, please interpret with caution; denominator is between 6 and 29

## Key Findings

In FY2016/17, 0 pre-operative ECG tests were conducted before 14 ophthalmologic surgeries in my hospital. My hospital's rate was 0.0%\* in FY2016/17, which is lower than the provincial rate of 13.9%. For the same time period, the rates ranged from 0.0%\* to 90.6% across Ontario hospitals that performed these procedures.

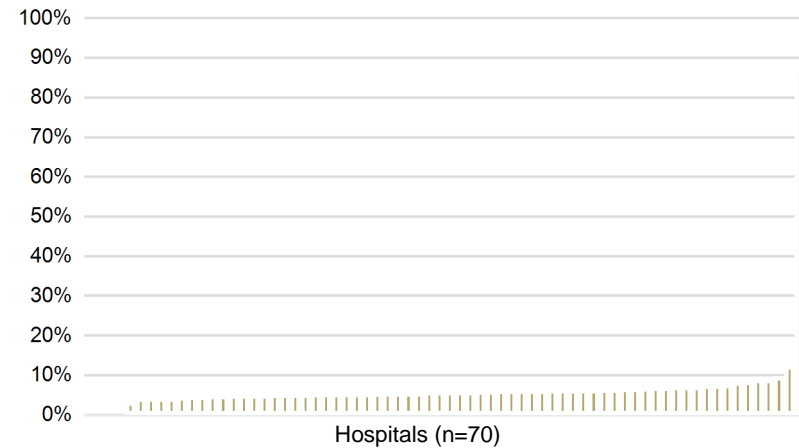
# My Hospital's Performance: Chest X-ray before Ophthalmologic Surgery

Percentage of ophthalmologic surgery cases with pre-operative chest X-ray, from FY2011/12 to FY2016/17



Period	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17
My Hospital	0.0%	12.5%	13.3%	9.4%	12.7%	†
Ontario	6.0%	6.0%	5.7%	5.9%	5.8%	5.8%

How did my hospital compare with others in FY2016/17?



Note: This graph and the analysis included in the table below do not include hospitals with suppressed data or hospitals without low-risk surgeries within the reporting period.

	FY2016/17
My Hospital (Purple)	†
Minimum value	0.0%*
25th percentile	5.2%
Median	6.0%
75th percentile	6.8%
Maximum value	86.3%

† Data suppressed; numerator and/or denominator is between 1 to 5

\* Unstable rate, please interpret with caution; denominator is between 6 and 29

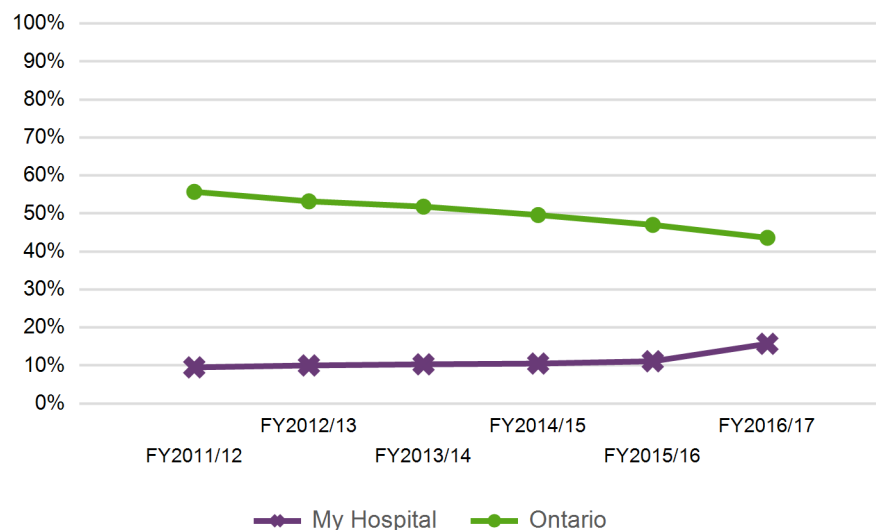
## Key Findings

In FY2016/17, data has been suppressed or no ophthalmologic surgeries were performed. The provincial rate in FY2016/17 is 5.8%. For the same time period, the rates ranged from 0.0%\* to 86.3% across Ontario hospitals that performed these procedures.

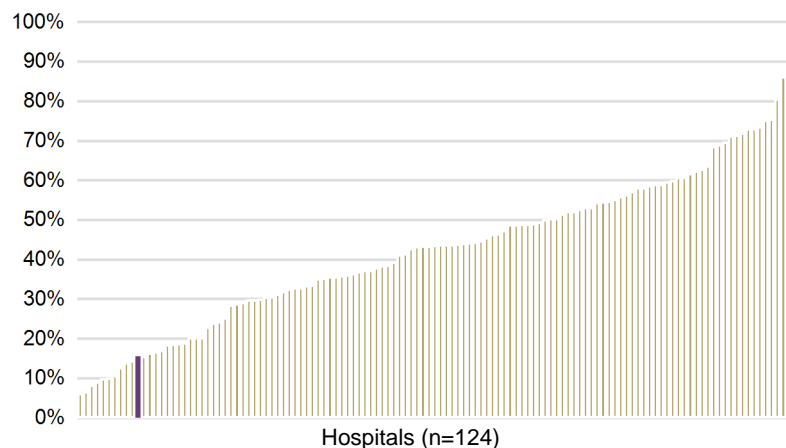


# My Hospital's Performance: ECG Test before Other Low-Risk Surgery

Percentage of other low-risk surgery cases with pre-operative ECG, from FY2011/12 to FY2016/17



How did my hospital compare with others in FY2016/17?



Note: This graph and the analysis included in the table below do not include hospitals with suppressed data or hospitals without low-risk surgeries within the reporting period.

Period	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17
My Hospital	9.5%	10.0%	10.3%	10.5%	11.1%	15.7%
Ontario	55.7%	53.2%	51.8%	49.6%	47.0%	43.6%

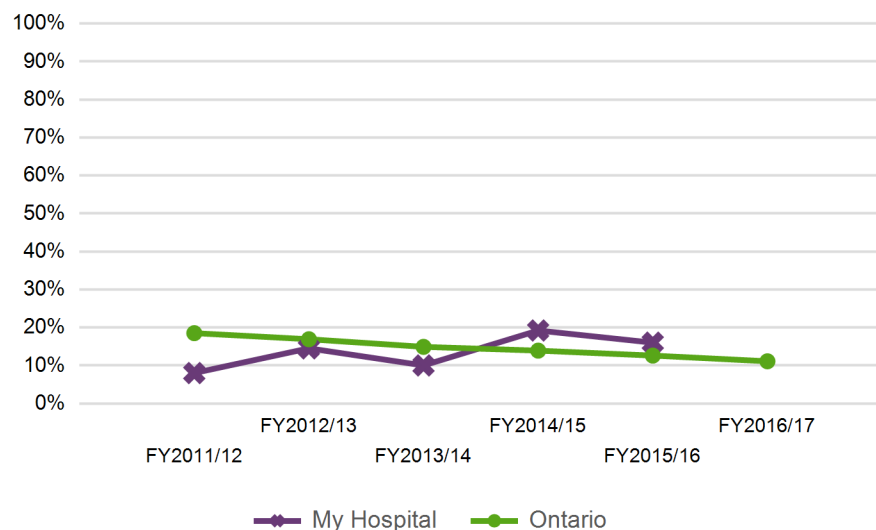
	FY2016/17
My Hospital (Purple)	15.7%
Minimum value	6.3%
25th percentile	30.1%
Median	43.8%
75th percentile	55.6%
Maximum value	88.0%

## Key Findings

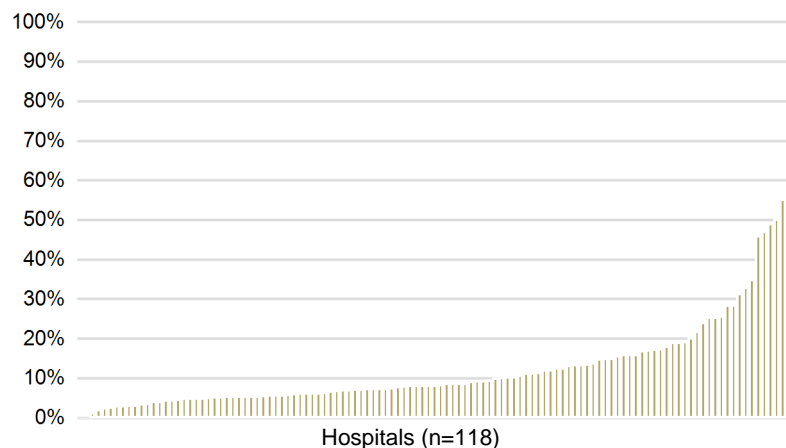
In FY2016/17, 167 pre-operative ECG tests were conducted before 1,063 other low-risk surgeries in my hospital. My hospital's rate was 15.7% in FY2016/17, which is lower than the provincial rate of 43.6%. For the same time period, the rates ranged from 6.3% to 88.0% across Ontario hospitals that performed these procedures.

# My Hospital's Performance: Chest X-ray before Other Low-Risk Surgery

Percentage of other low-risk surgery cases with pre-operative chest X-ray, from FY2011/12 to FY2016/17



How did my hospital compare with others in FY2016/17?



Note: This graph and the analysis included in the table below do not include hospitals with suppressed data or hospitals without low-risk surgeries within the reporting period.

Period	FY 2011/12	FY 2012/13	FY 2013/14	FY 2014/15	FY 2015/16	FY 2016/17
My Hospital	8.0%	14.5%	10.0%	19.2%	16.0%	§
Ontario	18.5%	16.9%	14.9%	13.9%	12.6%	11.1%

	FY2016/17
My Hospital (Purple)	§
Minimum value	0.0%
25th percentile	5.7%
Median	8.5%
75th percentile	15.7%
Maximum value	70.1%

§ No selected low-risk surgery within the reporting period

## Key Findings

In FY2016/17, data has been suppressed or no other low-risk surgeries were performed. The provincial rate in FY2016/17 is 11.1%. For the same time period, the rates ranged from 0.0% to 70.1% across Ontario hospitals that performed these procedures.

# Change Ideas

Identify areas of focus to improve your pre-operative testing indicators by asking yourself these questions:

- 1 Does your organization have any **quality improvement** work underway?
- 2 Have you engaged a team and **mapped** your **current** process for pre-operative testing for low-risk procedures?
- 3 Have you considered **revising** the current pre-op process and documentation?
- 4 Do you and your team have a process to **communicate** and update changes to staff, physicians and patients?
- 5 What is your plan for **sustaining** the practice changes?

The following are best practices, potential change ideas that have been developed from the literature, and examples of leading organizations that have decreased pre-operative testing for low-risk procedures.

- 1 Assess planned and existing quality improvement efforts and consider potential opportunities**  
**Consider:**
  - Reviewing & reflecting on the data
  - What perioperative projects are currently underway/completed?
  - Does this work align with the organizational strategy?
  - What opportunities exist for your organization to implement Choosing Wisely Canada (CWC)?
    - Quality Improvement Department
    - Champions/Clinical leadership
    - [Health Quality Ontario \(HQO\) Quality Improvement Plans](#)
  - What external resources and supports are available?  
*Selected examples:*
    - [Health Quality Ontario](#)
    - [Choosing Wisely Canada](#)
    - [Adopting Research To Improve Care \(ARTIC\)](#)
- 2 Describe your current pre-operative consultation process**
  - A) Engage leadership to identify current process**
    - Review low risk pre-operative [CWC recommendations](#)
    - Review ECG & chest X-ray utilization
  - B) Use a team approach**
    - See [Table 1](#) for suggested team members*Selected tools:*
    - [HQO Quality Compass](#)
    - [Reference Guide and Toolkit for Improvements in Perioperative Practice in Ontario](#)
  - C) Create a flow map outlining referral sources & documentation**
  - D) Review “Sample Process Map for Surgical Booking” in the following toolkit:**
    - [Drop The Pre-Op: A toolkit for reducing unnecessary visits and investigations in pre-op clinics](#)
- 3 Identify and test change ideas to optimize pre-operative testing**
  - A) Review & test the following documents in the [Drop The Pre-Op toolkit](#): [11]**
    - Pre-op Clinic Consultation Guideline
    - Pre-op Testing Grid
    - Examples of revised pre-operative order sets
  - B) Test and review your process improvements with [Plan Do Study Act \(PDSA\)s](#) (small tests of change)**

## 4 Implement the following change ideas for communicating practice changes

### A) Employ the following communication strategies for physicians and staff:

- Develop **standard message** around the project/recommendations
- Consider **emails, blogs, and updates** from existing leadership forums (e.g., Medical Advisory Committee geared to (i) the entire organization; and (ii) specific department(s))
- See Health Quality Ontario's [Quality Compass](#)
- [Reference Guide and Toolkit for Improvements in Perioperative Practice in Ontario](#) [12]

### B) Involve patients & family

#### *Selected Tools:*

- [Health Quality Ontario's patient engagement tools & resources](#)
- Provide patients with *Choosing Wisely Canada* [13] patient materials:
  - [Anesthesiology: Five Things Physicians and Patients Should Question](#)
  - [Heart tests before surgery](#)
  - [Dr. Mike Evans video: Do more screening tests lead to better health?](#)

## 5 Implement the following change ideas to assist in sustaining practice changes

### A) Featured change ideas:

- Review ECG & chest X-ray utilization regularly
- Ensure that the leadership team regularly communicates practice changes or changes within the organization
- Implement a process to educate new staff and clinicians on the pre-operative consultation process

### B) Review "Sample Pre-op Clinic Consultation Guideline" in the following toolkit:

- [Drop The Pre-Op: A toolkit for reducing unnecessary visits and investigations in pre-op clinics](#)

## Additional supports to reduce pre-op testing

### Reach out to colleagues through:

- [Choosing Wisely Canada Events](#)
- [Choosing Wisely Canada](#)

### Professional Association's CWC Recommendations

- [Canadian Anesthesiologists' Society](#)
- [Canadian Association of General Surgeons](#)
- [Canadian Association of Radiologists](#)

### Additional Tools and Resources

- [Health Quality Ontario](#)
- [Choosing Wisely Canada](#)
- [IHI's, How-to Guide: Sustainability and Spread](#) [14]
- [Preoperative Testing in Asymptomatic Patients Undergoing Low or Intermediate-Risk Noncardiac Surgery: A Scoping Review](#)

**Table 1. List of Suggested Team Members**

Program	Team Members
<b><i>Pre-operative Services (Referral Sources)</i></b>	<ul style="list-style-type: none"> <li>• Clinical Chiefs</li> <li>• Surgeons and Anesthesiologists</li> <li>• Office Staff of Surgeons and Anesthesiologists</li> <li>• Surgical and/or Pre-Operative Clinic Clinical Educator</li> <li>• Pre-operative Clinic Management and Staff</li> </ul>
<b><i>Hospital Leadership (Assists with messaging and buy-in)</i></b>	<ul style="list-style-type: none"> <li>• Chief Executive Officer and Vice President Medical/Chief of Staff</li> <li>• Medical Advisory Committee/Medical Chiefs</li> <li>• Chief Nursing Officer / VP Clinical Services</li> <li>• Director and Manager of Surgery and Anesthesia</li> </ul>
<b><i>Decision Support (Data Support)</i></b>	<ul style="list-style-type: none"> <li>• Director and Manager</li> <li>• Staff</li> </ul>
<b><i>Diagnostic Imaging and Lab (Where testing happens)</i></b>	<ul style="list-style-type: none"> <li>• Director and Chief of Diagnostic Imaging</li> <li>• Director and Chief of Laboratory Services</li> <li>• Staff</li> </ul>
<b><i>Nursing Leadership (Lead practice changes and implementation)</i></b>	<ul style="list-style-type: none"> <li>• Director of Professional Practice</li> <li>• Nurse Manager in target area(s)</li> </ul>
<b><i>Quality Improvement Department (Project planning, execution and follow up)</i></b>	<ul style="list-style-type: none"> <li>• Director</li> <li>• Team</li> </ul>

# Methods Notes

## Identifying low-risk surgery cases

The following inclusion criteria are used to identify low-risk surgery procedures:

- Ontario adult patients (aged 18 and older)
- Outpatient day surgery or acute in-patient settings
- Elective admission
- Low-risk surgery is identified by one of the following procedure codes recorded in the first intervention code field: endoscopy, ophthalmologic surgery or other low-risk surgeries. A detailed list of procedure codes can be found in the *Technical Appendix* available online at [www.hqontario.ca/hospitalreport](http://www.hqontario.ca/hospitalreport)
- The selected low-risk procedure is performed on the date of admission
- All procedures for patients who underwent more than one eligible procedure during the reporting period

## Identifying cases with pre-operative ECG and chest X-ray tests

ECG or chest X-ray tests occurring within 60 days prior to the index procedure date were considered pre-operative.[15] OHIP claims are used to identify patients who underwent ECG or chest X-ray tests before their procedures.

## Indicator calculation

Crude rate of pre-operative ECG or chest X-ray tests is calculated for the following surgery groups:

- Endoscopy
- Ophthalmologic surgery
- Other low-risk surgeries

## Data sources

The data sources used in the report include:

- Canadian Institute for Health Information (CIHI) Discharge Abstract Database (DAD) and CIHI National Ambulatory Care Reporting System (NACRS);
- Ontario Health Insurance Plan (OHIP) Claims History Database (i.e. OHIP physician service claims); and
- The Registered Persons Database (RPDB)

## Available data periods and reporting level

The available data is from fiscal year 2011/12 to fiscal year 2016/17.

Data is calculated at hospital level and also at hospital corporation level if more than one hospital site performed the selected low-risk surgeries within one corporation. Corporation level data is reported in the corporation level report, while hospital site level data is included in the supplemental hospital site level report. Ontario data is also presented in the report for comparison.

## Data interpretation notes

**Data suppression due to privacy:** to ensure privacy, when numerators and/or denominators are between 1 and 5, all values, including numerator, denominator and rate are suppressed and denoted by symbol “†”. Please note that in order to avoid back calculation, suppressed hospital site level data are not included in the hospital corporation level reporting.

**No procedures during reporting period:** all values, including numerator, denominator and rate are denoted by symbol “§” if no selected low-risk surgical procedures were performed within the reporting period.

**Flag for unstable rates:** indicator rates are considered as unstable and are flagged with an asterisk “\*” if the denominator is between 6 and 29. The data should be interpreted with caution.

**Data used for the institutional variation graph/analysis:** The most recent fiscal year for which data are available, i.e. FY2016/17 data are used in the institutional variation bar graphs and corresponding range analysis. Please note that hospitals with suppressed data or without any selected low-risk procedures are not included. Hospitals with flagged unstable rates are included.

**Data distribution analysis in the institutional variation section:** In order to help hospitals better understand how their performance is compared with others, the following distribution data are provided under the institutional variation graph: minimum, maximum, and quartiles (i.e. the 25th percentile, median, and the 75th percentile). For definitions and calculation methods of those statistics, please refer to the *Technical Appendix* available online at [www.hqontario.ca/hospitalreport](http://www.hqontario.ca/hospitalreport).

## Data Limitations:

1. Although there is no validated comprehensive “low-risk” surgical procedure list, it should be noted that the procedures included in this report are in line with the broad definition of “low-risk procedures” outlined in existing research[10] and guidelines on peri-operative cardiac evaluation.[15,16] The majority of the procedures are minimally invasive and are performed in outpatient settings. For a complete list of surgical procedure codes, please refer to the *Technical Appendix* available online at [www.hqontario.ca/hospitalreport](http://www.hqontario.ca/hospitalreport).
2. Not all pre-operative testing is of low value. Some patients may benefit from those tests as they provide valuable clinical data. Currently available data from administrative databases have no information that could help determine the appropriateness of these tests and the reasons they are conducted. However, patients who have undergone these elective low-risk surgery generally have a low number of comorbidities.[10] With the selection of the low-risk procedures and the low-risk patient group, it is unlikely that the majority of tests were ordered to evaluate new clinical symptoms or abnormal physical findings.
3. All tests conducted within 60 days before the index low-risk surgery are included in the analysis. It is possible that some tests were ordered for indications other than pre-operative testing. However, this period is generally accepted by hospitals for pre-operative evaluation and has been used in previous studies.[10,15,17]

## About Health Quality Ontario

Health Quality Ontario is the provincial advisor on quality in health care. Health Quality Ontario reports to the public on the quality of the health care system, evaluates the effectiveness of new health care technologies and services, provides evidence-based recommendations, and supports the spread of quality improvement throughout the system.

## About Choosing Wisely Canada and the Institute for Clinical Evaluative Sciences

This report was developed in partnership with Choosing Wisely Canada, which is a campaign to help clinicians and patients engage in conversations about unnecessary tests and treatments and make smart and effective choices to ensure high quality care. Launched in April 2014, 45 Canadian medical societies, representing 98% of all physicians in Canada, have joined the campaign to develop “top 5 lists” of tests and treatments providers and patients should question – things for which there is strong evidence of overuse, waste, or even harm to patients. Over 170 specific recommendations have been released to date, including several related to pre-operative testing.

This report was supported by the Institute for Clinical Evaluative Sciences (ICES), which is an independent, non-profit organization that produces knowledge to enhance the effectiveness of health care for Ontarians. Internationally recognized for its innovative use of population-based health information, ICES evidence supports health policy development and guides changes to the organization and delivery of health care.

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Parts of this material are based on data and information compiled and provided by the Canadian Institute for Health Information (CIHI). However, the analyses, conclusions, opinions and statements expressed herein are those of the authors, and not necessarily those of CIHI.



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