

**Choosing  
Wisely  
Manitoba**



**Appropriate Preoperative Diagnostic Testing  
A Choosing Wisely Manitoba Initiative**

**Final Report Summary**

**Prepared by:**

Eric Bohm, MD MSc FRCPC

Sarah Kirby, MPH

Albert Mota

Thomas Mutter MD

Ola Norrie, PhD, MSc, BSc (Pharm), CRE

Ashley Struthers, MA

# Highlights

- The implementation of a revised cataract surgery History and Physical form to eliminate cues for unnecessary preoperative tests, in combination with the Red-Green project, was associated with a significant reduction in preoperative testing of 75.6%.
- It is estimated that this conservatively represents a savings of \$118,000 per year in preoperative lab tests.
- The strategic implementation of revised provincial preoperative diagnostic testing guidelines along with supporting documents such as revised Preoperative History and Physical forms was associated with a significant reduction in preoperative testing of 37.67% and a significant reduction in unnecessary testing of 34.24%.
- It is estimated that this conservatively represents a savings of \$821,000 to \$985,000 per year in preoperative lab tests.
- Careful consideration of the barriers and facilitators to guideline uptake through the Discovery Phase contributed significantly to the development of effective knowledge translation strategies to ensure adoption of the new guidelines.
- Engaging key stakeholders throughout all phases of the project encouraged buy-in and ensured other barriers to implementation and adoption were identified.
- Post implementation survey results reveal that 92% of surgical offices had incorporated the guidelines into their practice but that only about 50% were using the new cover letter templates. Further effort is needed to adopt the standardized cover letters.
- Follow-up through an audit and feedback process is ongoing. Initial audit results reveal that the majority of surgeons are compliant with the revised guidelines. Variation in compliance between surgical specialties indicates a need for targeted feedback.

## Background

Choosing Wisely Canada (CWC) 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. Unnecessary tests and treatments do not add value to care, instead they can take away from care by potentially exposing patients to harm, leading to more testing to investigate false positive tests, and contributing to stress and avoidable costs for patients.

Preoperative diagnostic tests such as chest x-rays, electrocardiography and laboratory testing are often ordered prior to surgical procedures. They are generally used to help to stratify risk, direct anesthetic choices and guide the surgery and postoperative management. Ideally, preoperative tests should be guided by the patient's clinical history, comorbidities, and physician examination findings, unfortunately they are often simply ordered out of protocol.

The value and appropriateness of routine preoperative tests, especially in minor (low risk) surgery, has been challenged for some time (Booth, Nicholl, 1997; Cabana et al., 1999) and many practice guidelines and recommendations around preoperative testing have been developed. In 2015 the Canadian Anesthesiologist's Society (CAS) released five Choosing Wisely Canada (CWC) recommendations around reducing unnecessary preoperative testing further reinforcing the importance of reducing unnecessary preoperative testing.

In Manitoba, as in other jurisdictions, audits have shown that many patients continue to receive unnecessary preoperative tests despite province wide guidelines. In 2015, with \$200,000 in funding from the Manitoba Patient Access Network (MPAN), Choosing Wisely Manitoba (CWMB) embarked on a multi-phase project that aimed to identify the barriers and facilitators to sustainable adoption of the preoperative testing guidelines in order to reduce unnecessary preoperative diagnostic testing. The project entitled "Appropriate Preoperative Diagnostic Testing "Getting it Right"" had a broad goal "*to ensure all Manitobans receive the necessary and appropriate preoperative diagnostic testing for elective surgeries through the sustainable implementation of a standardized, evidence-informed clinical practice guideline.*"

## Discovery Phase

This multi-phased project started with a discovery phase with an objective to understand more about the specific barriers and facilitators to adoption and implementation of preoperative diagnostic testing guidelines in surgical sites in Winnipeg. This involved an analysis of previous audit results, extensive stakeholder consultation, and a literature review. The results of the discovery phase revealed;

Audits:

- The majority of all unnecessary diagnostic tests were carried out by 3 specialties;
  - Ophthalmology/cataracts
  - Orthopaedics
  - General surgery

Consultation:

- Physicians were not aware of/disagreed with the guidelines;
- The guidelines were time consuming to interpret;
- Surgeons' cover letters conflicted with the guidelines;
- Liability concerns and worries that missed tests would lead to cancelled surgeries;
- Burden of paper and lack of EMR integration;
- Lack of timely information can lead to repeat tests by Preadmission Clinics; and
- No mechanism to provide feedback to practitioners about their ordering behavior.

#### Literature Review:

- Implementing guidelines requires a multi-pronged approach as guidelines alone have limited impact on changing physician behavior (Cabana, et al., 1999);
- Understanding the local context and barriers to implementation are critical;
- The most effective strategies include printed educational materials, educational meetings, educational outreach, local opinion leaders, audit and feedback and reminders.

Based on the results of the Discovery Phase, a multidisciplinary team of key stakeholder participated in developing a strategy for the implementation and sustained adoption of Preoperative Diagnostic testing guidelines. This involved a 3-staged approach over 2 years.

## **PHASE 1: Implementation Cataract Surgery Subproject**

***(September, 2015)***

Through the discovery phase it was determined that although there was a Winnipeg Regional Health Authority (WRHA) Preoperative History and Physical (H&P) form that was used by most surgical specialties, cataract surgery had its own simplified H&P form that was developed as part of a "Red-Green" Project. This project was intended to reduce wait times and improve patient experience in cataract surgery. Most significantly, the Red-Green Project developed a process for categorizing cataract patients' anesthesia risk into 2 groups, "red" patients, who required an H&P and "green" patients who proceed to surgery without an H&P. An initial study testing this process found that approximately 40% of patients were classified as red, and 60% green. The Red-Green project was rolled out in January and February 2015 to all ophthalmology offices. However, this H&P form cued physicians to requisition several diagnostic tests. The intervention for this Choosing Wisely project included engagement with the ophthalmology team at Misericordia Health Centre and the implementation of a revised Cataract H&P Form that eliminated the cues for preoperative tests.

Key stakeholders were involved in multiple rounds of revisions to the H&P form before the final implementation in September 2015. The new forms removed cues for unnecessary tests, incorporated CW branding and included a clear statement that "Diagnostic tests are not required for cataract surgery". Old H&P forms were removed from all ophthalmologists' offices at the time of implementation.

## Results

A detailed report on the methods and results of the cataract subproject can be found in Appendix 1. Audits were carried out at three points during this phase. Audit 1 occurred in November 2014, prior to the implementation of the Red-Green project and the CW revised Cataract H&P Form. Audit 2 was conducted in August of 2015 post Red-Green project and Audit 3 was conducted in August 2016 post CW revised Cataract H&P form.

The audit revealed that by August, 2016, the revised H & P forms were being used 95.7% of the time. Overall, between Audits 1 and 3 there was a reduction of 77.5% in patients with tests ordered. Tests per patient also decreased over the 3 audits, from 1.93 tests/patient in Audit 1, to 0.40 tests/patient in Audit 3 (which represents a 75.6% reduction in tests/patient).

Statistical differences in testing between Audits 1, 2 and 3 using Pearson Chi-Square revealed a highly significant ( $p < 0.001$ ) drop in testing. Examination of the standardized residuals showed that preoperative testing went from significantly more than expected (Audit 1) to significantly less than expected (Audit 3). In summary, a relationship between audit and testing was found, with later audits having significantly less preoperative testing and the difference being the greatest between audits 1 and 3.

Based on the sample of pre-op testing for cataract surgeries analyzed in this paper it is estimated that approximately \$118,000 per year in preoperative lab costs were saved (estimate for 6173 unique patients) due to decreased testing between these two audits.

## **PHASE 2: Implementation of Revised Preoperative Diagnostic Testing Guidelines to all Surgical Specialties**

***(July 11, 2016)***

Based on the results of the discovery phase, lessons learned from the cataract subproject, and audits of the cover letters used in surgical offices, a team of key stakeholders developed a multi-pronged approach to the implementation of preoperative diagnostic testing guidelines in all surgical specialties. This included representatives from the WRHA Surgery Program, Preoperative Assessment Clinics (PAC), Max Rady College of Medicine Departments of Surgery, Anesthesia and Family Medicine and Primary Care Providers (PCPs) in the region. The project was led by Choosing Wisely Manitoba (CWMB) with support from the George and Fay Yee Centre for Healthcare Innovation (CHI) and Shared Health – Diagnostic Services (formally Diagnostic Services Manitoba). This intervention included the following components:

- 1) Revised Preoperative Lab Test Guidelines (enhanced user-friendliness, link to web-based decision aid, branded and aligned with current CWC recommendations);
- 2) Revised Preoperative History and Physical (H & P) Form (cues for testing removed, abridged guidelines included, QR code link to the full guideline and a web-based decision aid added);
- 3) Preoperative Care Cover Letter Template (standardized letter to patients);

- 4) Family Physician Preop Instruction Letter Template (standardized letters to family physician's offices, removing reference to requests for tests that were not in-line with guideline);
- 5) Decision Support Aid (web-based app) <http://logixmd.com/preop/>;
- 6) Comprehensive Communication and Dissemination strategy;
- 7) Improved Stakeholder Engagement (use of clinical champions/leaders, liaise with surgical office support staff through site visits & surveys)

Communication focused on healthcare providers and the messages included: More is not always better; unnecessary tests expose patients to delays and unintended harm; the project has executive support and partnerships with many organizations; and cost savings will be redirected to more appropriate areas.

The revised guidelines, H&P form, Preoperative Care Cover Letter Template and Family Physician Preoperative Instruction Letter template were shared with all family physicians, surgeons, anesthesiologists, nurse practitioners, and physician's assistants across the province. The H&P form was also rolled out by the three largest electronic medical record (EMR) providers in the province, and came equipped with time saving features to assist physicians by auto-populating the document with information already available in the EMR. The project team worked with all hospitals within the WRHA to ensure that the H&P Form was available at each locations respective print shop.

## **Results**

Qualitative and quantitative methods were used to evaluate the effectiveness of the implementation intervention. Detailed reports of the evaluations can be found in Appendix 2 and Appendix 3.

Overall, qualitative and survey data (23% response rate) (Appendix 2) suggest that efforts towards engagement and using established leaders and champions were factors that facilitated the successful implementation of strategies to support the sustainability of the preoperative testing guideline. Although support for the revised guideline appeared to be high, communication between surgeons, in particular communication that was not aligned with the guideline, limited the success of these strategies. The majority of surgeons (N=174) and anesthesiologists (N= 165) surveyed thought the revised guidelines had the most significant impact on reducing unnecessary preoperative testing (76 and 85% respectively). Out of 24 randomly selected surgical office assistants (SOA) surveyed, 22 (92%) had incorporated the guideline in their practice and about half were using the new cover letter templates. Further effort is needed to encourage surgeons to adopt the standardized cover letters and improve communication between stakeholders.

Two manual chart audits were used to determine if preoperative tests had been reduced following implementation of project activities (Appendix 3). The retrospective, observational chart review audits included a sample of WRHA surgical patients at two time periods: (1) baseline, one typical week in 2013 (May 6-10); and (2) post-implementation, one typical week in 2017 (May 8-12). "Typical week" is defined as a week without a statutory holiday or other reduction in surgical volume.

Data was analyzed using SPSS v 21 for statistically significant differences in the number of preoperative tests between 2013 and 2017 using negative binomial regression with a log link.

Analysis of the data obtained for both audits demonstrated a significant reduction in unnecessary testing ( $p < 0.0001$ ) with a reduction of 34.24% in the number of unnecessary tests (2.95 to 1.94 tests per person from pre to post). The results also demonstrated a significant ( $p < 0.0001$ ) reduction in the average number of all ordered tests per person from 5.07 to 3.16, a difference of 37.67% from pre to post implementation.

A simple economic analysis of resources saved was used to conservatively estimate the benefits gained from overall project interventions. The reduction in the number of inappropriate tests amounted to an average of \$16.67 saved per person. Analysis of costs for all ordered tests showed a reduction of \$31.59 per person (from \$69.53 to \$37.94/person) from 2013 to 2017 audits. This represents a 45.4% decrease in overall preoperative testing costs. Based on conservative estimates of the average weekly volume of 500 – 600 surgeries that meet the guideline criteria, this corresponds to an estimated \$821,000 to \$985,000 in yearly economic benefits that may be re-invested into the system.

## **Phase 3: Audit and Feedback**

### ***(September 2017 – October 2018)***

In September 2017 the project team conducted approximately 10 chart audits of surgeons in each of the 8 surgical sites in Winnipeg (excluding cataract surgery and pediatrics) in order to monitor adherence to the new guidelines. The audit involved working closely with PAC nurses who were provided a simple one-page data collection form to audit eligible surgeries. This work took longer than initially planned due to the massive changes related to clinical consolidation in the region.

The results revealed that the majority of surgeries were compliant with the guidelines (60%). However there was a large range in the number of unnecessary tests ordered between surgical specialties from 24% of tests ordered are unnecessary to 72%, indicating a need for targeted feedback. Bloodwork was most frequently ordered inappropriately (82%) followed by ECG (36%) and chest x-ray (31%). Inappropriate tests were ordered 43% of the time for minor surgery and 36% of the time for major surgery.

The project team is working closely with the Department of Surgery to provide feedback to each Section and to each surgeon who participated in the audit. The feedback will be branded as CW and delivered by letter and will include tools and resources to facilitate uptake of the revised guidelines (e.g., copies of the revised H&P Forms, the Preoperative Care Cover Letter Template and Family Physician Preoperative Instruction Letter template and the link to the web-based decision aid <http://logixmd.com/preop/>).

## **Conclusion:**

Choosing Wisely Manitoba was able to successfully implement updated provincial preoperative diagnostic testing guidelines by carefully considering the barriers and facilitators to implementation and adoption and by engaging key stakeholders throughout all phases of the project. While the results reveal that the majority of surgical offices are using the revised provincial guidelines and the amount of preoperative testing has decreased significantly, audits of all surgeons revealed a large range in test

ordering between surgical specialties. This, along with the post implementation survey results, underscores the need for targeted feedback and encouragement to adopt the standardized cover letters within surgical offices.

The reduction in preoperative testing demonstrated in this project (between 2013 and 2017) represents a conservative annual savings of \$821,000 to \$985,000 for Phase 2 of the project (all surgical specialties) and an annual savings of \$118,000 for the cataract subproject. These annual savings are based on the audit sample and were calculated using test costs provided to the team by Shared Health, Diagnostic Servicers (formally DSM).