



DROP THE PRE-OP

A toolkit for reducing unnecessary visits and investigations in pre-operative clinics

Don't order unnecessary pre-transfusion testing (type and screen) for all pre-operative patients.

Canadian Society for Transfusion Medicine,
Choosing Wisely Canada recommendation #7.

Don't perform stress cardiac imaging or advanced non-invasive imaging as a pre-operative assessment in patients scheduled to undergo low-risk non-cardiac surgery.

Canadian Cardiovascular Society,
Choosing Wisely Canada recommendation #3.

Don't order baseline laboratory studies (complete blood count, coagulation testing, or serum biochemistry) for asymptomatic patients undergoing low-risk non-cardiac surgery.

Don't order a baseline electrocardiogram for asymptomatic patients undergoing low-risk non-cardiac surgery.

Don't order a baseline chest X-ray in asymptomatic patients, except as part of surgical or oncological evaluation.

Don't perform resting echocardiography as part of preoperative assessment for asymptomatic patients undergoing low to intermediate-risk non-cardiac surgery.

Don't perform cardiac stress testing for asymptomatic patients undergoing low to intermediate risk non-cardiac surgery.

Canadian Anesthesiologists' Society,
Choosing Wisely Canada recommendation #1, #2, #3, #4, and #5

Avoid admission or preoperative chest X-rays for ambulatory patients with unremarkable history and physical exam.

Canadian Association of General Surgeons,
Choosing Wisely Canada recommendation #4

Don't routinely perform preoperative testing (such as chest X-rays, echocardiograms, or cardiac stress tests) for patients undergoing low risk surgeries.

Canadian Society of Internal Medicine,
Choosing Wisely Canada recommendation #5

Avoid routine preoperative laboratory testing for low risk surgeries without a clinical indication.

Canadian Association of Pathologists,
Choosing Wisely Canada recommendation #3



Inspiration for this Toolkit

North York General Hospital's (NYGH) Preoperative Assessment Clinic (PAC) was evaluating about 40 patients per day and over 900 patients per year. Most of these patients were presenting for low/moderate-risk surgery and were considered low/moderate-risk patients. An internal audit revealed that many of these cases underwent pre-surgical assessments and investigations that were deemed to be medically unnecessary because they did not provide useful information that subsequently altered perioperative patient care or outcomes. In fact, many of these preoperative clinic visits and test may contribute to healthcare system inefficiency/cost, potential patient harm due to medical intervention and follow-up and wastage of patients' time and opportunity cost. As a result, a multidisciplinary team was formed to re-evaluate the medical priorities of the PAC and create a system that provided individual, patient-focused care designed to avoid medically-unnecessary pre-operative assessments and investigations. The PAC at NYGH was able to achieve a sustained 30-40% reduction in both preoperative assessments and investigations without any documented/perceived negative outcomes in patient care.

This toolkit was co-authored by Aaron Mocon, Donna McRitchie and Aliya Tharani, the key individuals involved in the NYGH project.



Introduction

This toolkit was created to support the implementation of interventions designed to reduce unnecessary visits and decrease unnecessary investigations in pre-operative clinics. It can be used by physician groups and organizations that provide pre-operative assessments in order to optimize the process.



Make sure this toolkit is right for you

This toolkit is well suited for your institution if you have a significant number of low-risk or day-surgery patients attending your pre-operative clinic or if you have noticed significant variability in pre-operative investigation ordering practices. Research on routine laboratory testing before low-risk surgery has shown that the majority of results are normal, and less than 3% of abnormal results lead to a change in management.¹



Key ingredients of this intervention

If this description accurately reflects the current situation in your pre-operative clinic, this toolkit may help your institution reduce unnecessary pre-operative clinic visits and unnecessary investigations by introducing the following changes:

- Consensus criteria for selecting patients requiring pre-operative clinic visits
- Standardized criteria for appropriate pre-operative investigations based on patient factors, surgery factors, and inherent risk factors associated with the type of surgery performed

Establishing credible and effective leadership

A successful implementation team is a key factor in driving change and involves a group of multi-disciplinary participants representing all stakeholder groups. Credible and effective leadership is required to support the initiative and effect change. There may be times when 100% consensus is not possible, however after appropriate engagement, leaders must be able to make a reasonable decision to move forward.

Achieving consensus among key stakeholder groups

Achieving consensus among stakeholder groups including anesthesiologists, surgeons, internists, nurses, and office administration is a crucial step in the development and implementation of interventions. The proposed changes will require agreement on 1) the criteria for selecting which patients require pre-operative clinic visits and 2) what investigations are necessary for these pre-surgical patients.

Achieving consensus on clinical criteria for pre-operative assessments and investigations is especially important given the natural practice pattern variation that exists among members of a department. This step is critical to avoid potential same-day surgery cancellations due to perceived missing assessments/investigations because for any given patient, the pre-operative clinic consultant anesthesiologist is likely not the attending anesthesiologist on the day of surgery.

Once consensus is achieved, practice changes should be reviewed by the relevant hospital administration bodies (medical advisory committee, professional practice, etc.). This can be accomplished by supporting recommendations with evidence, where available. If no clear evidence is available, current practice can be used to establish recommendations.

Striving for a culture of improvement, positive change and innovative quality processes for patients can help drive the changes forward. Unnecessary interventions, associated wait times for tests and consultations, enduring unnecessary anxiety and aggravation are all imperatives for change.

Implementing the intervention

The focus of your intervention will depend on a review of your pre-operative clinic's current situation and an assessment of what may need to change or be enhanced. This should be part of your initial "goal-setting" exercise.

Two major components of this intervention that can provide the best and most comprehensive opportunities for change include:

- 1) Identifying which patients need a pre-operative clinic visit
- 2) Selecting investigations for pre-operative testing

Local context will determine which intervention is most appropriate, however greatest success is achieved with implementation of both initiatives. At all times, recommendations need to be specific, targeted and sensitive to the local environment in order to achieve credibility and buy-in. Identifying a contact person who is available to troubleshoot concerns on a daily basis during the implementation period is important. As a perioperative physician, an anesthesiologist (such as the one assigned to the preoperative clinic that day), would be the ideal choice.

Identifying which patients need a pre-operative clinic visit

This intervention relies on achieving consensus among surgeons and anesthesiologists around selection of patients requiring pre-operative clinic visits. These patients are typically identified based on a combination of their planned surgical procedure(s) and physiological status. An example of a *pre-op clinic consultation guideline* currently used to identify patients requiring a pre-operative clinic visit, or not, is provided on the next page. This *clinical decision tool* (CDT) is used at North York General Hospital in Toronto, mainly by surgeon's offices to help guide decision-making at the time of surgical case booking.

If the complexity of the surgery and/or patient factors make the use of this tool difficult for the surgeon's office, the perioperative physician in the clinic is always available to answer questions and make decisions regarding the need for a pre-operative clinic visit or other specialty consultation.

Sample Pre-op Clinic Consultation Guideline

NYGH Pre-operative Clinic Consultation Guideline (This table is intended as a guideline only)

Surgical Category Patient's Physiological Status	i. Minimally invasive	ii. Minimal to moderately invasive	iii. Moderately to significantly invasive	iv. Highly invasive	v. Other Procedures
1 No organic, physiologic, biochemical or psychiatric disturbance	No Pre-Op Visit	No Pre-Op Visit	Pre-Op Visit: RN Only	Pre-Op Visit: RN, Anesthesia, +/- Medicine	Pre-Op Visit: RN, Anesthesia, +/- Medicine
2 Mild to moderate systemic disturbance Example: Heart disease that slightly limits physical activity, hypertension, diabetes, chronic bronchitis, anemia	No Pre-Op Visit	Pre-Op Visit: RN Only	Pre-Op Visit: RN Only	Pre-Op Visit: RN, Anesthesia, +/- Medicine	Pre-Op Visit: RN, Anesthesia, +/- Medicine
3 Severe systemic disturbance that limits activity Example: Heart or chronic pulmonary disease that limits activity, poorly controlled hypertension, diabetes on insulin and/or with complications, angina pectoris, history of previous MI, OSA +/- CPAP, cancer	Pre-Op Visit: RN, Anesthesia, +/- Medicine				
4 Severe systemic disturbance that is life threatening Example: CHF, persistent angina pectoris, advanced pulmonary, renal, or hepatic dysfunction, recent TIA	Pre-Op Visit: RN, Anesthesia, +/- Medicine				
Patients requiring unique perioperative care Example: Anticoagulant medications +/- bridging required, coagulopathy, polypharmacy, Jehovah's Witness, airway concerns, history of problems with anesthetics, chronic pain, planned ICU admission, obstetrical patient with comorbidity	Pre-Op Visit: RN, Anesthesia, +/- Medicine				

*Ophthalmology patients undergoing lens surgery with local anesthetic and sedation do not require routine preoperative consultation

Medicine Consult Recommended For:

- Coronary artery disease
- Type 1 or type 2 diabetes on insulin or >2 oral agents
- Use of aspirin, clopidogrel, ticagrelor, prasugrel, warfarin, dabigatran, rivaroxaban, apixaban or edoxaban
- Elevated cardiac risk (2 or more of: CAD, CHF, CKD, DM on insulin, TIA/stroke)
- Use of steroids (or recent taper) or immunosuppressive medications
- Need for endocarditis prophylaxis (undergoing GI/GU/oral procedure with history of IE, prosthetic valve, cyanotic heart disease or heart transplant)
- Elevated respiratory risk (asthma/COPD with recent or frequent exacerbations, ILD)

Abbreviations and Acronyms

CAD – Coronary Artery Disease

CHF – Congestive Heart Failure

CKD – Chronic Kidney Disease

COPD – Chronic Obstructive Pulmonary Disease

CPAP – Continuous Positive Airway Pressure

DM – Diabetes Mellitus

ENT – Ear, Nose and Throat Surgery or Otolaryngology, Head and Neck Surgery

GEN – General Surgery

GI – Gastrointestinal

GU – Genitourinary

GYN – Gynecological Surgery

ICU – Intensive Care Unit

IE – Infective Endocarditis

ILD – Interstitial Lung Disease

MI – Myocardial Infarction

OPHTHAL – Ophthalmological Surgery

ORAL – Oral and Maxillofacial Surgery

ORTHO – Orthopedic Surgery

OSA – Obstructive Sleep Apnea

PLAS – Plastic and Reconstructive Surgery

Pre-Op – Preoperative

RN – Nursing

PSYCH – Psychiatry

TIA – Transient Ischemic Attack

UROL – Urological Surgery

VASC – Vascular Surgery

Selecting appropriate investigations for pre-operative testing

A number of Choosing Wisely Canada pre-operative clinic testing recommendations are provided on page 2 and are meant to act as a starting point for change. Additional review of the literature can help identify best practice and achieve consensus among physician groups. These consensus criteria can then be translated into a pre-operative testing grid, a clinical decision tool (CDT) that identifies appropriate pre-operative investigations based on a range of factors. The following is an example of the current testing grid used at North York General Hospital in Toronto.

Sample Pre-Operative Testing Grid

	CBC	G&S	Creat	Lytes	Gluc	LFTs	INR & PTT	EKG	CXR
Surgical procedure on Group and Screen List (refer to **MSBOS).									
History of anemia, bleeding disorder and/or active bleeding. Major cardiovascular disease (i.e. exercise tolerance of METS <4 see table below). Cancer diagnosis. Age >70 or < 1 year old.									
History of renal, adrenal, pituitary or major systemic endocrine disease.									
Use of digoxin, lithium, diuretics, ACE-I or ARB. History of electrolyte abnormality.									
History of diabetes.									
History of systemic steroid use within 6 months.									
History of bleeding disorder, liver disease or malnutrition. Alcohol use >2 drinks/d for women and >3/d for men.									
Use of anticoagulant drugs (except ASA).									
Age >69. History of cardiac disease, peripheral, cerebral or pulmonary vascular disease. ≥ 2 risk factors (HTN, CKD, DM, OSA, BMI>35)									
Symptomatic respiratory or cardiac disease (METS <4 – see table below). History of lung cancer or mass.									

If there is any doubt regarding appropriate preoperative testing please notify the Pre-Operative Clinic Anesthesiologist for guidance. Please avoid ordering repeat testing (and include current test results) if a patient has had recent similar testing and there are no new changes to the patient's health or therapies:

βhCG can be ordered, if result would change management, on the Preop Order Sheet.

Sickle cell screen can be ordered for high risk populations (West Central Africa, Saudi Arabia, East Central India, Southern Italy, Northern Greece, Southern Turkey, African American, Caribbean), if result would change management, on the Pre-op Order Sheet.

****MSBOS** = Maximum Surgical Blood Order Schedule

Estimated Energy Requirements for Various Activities

<div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center; margin-right: 10px;"> <p>1 MET</p> <p>10 METs</p> </div> <div style="flex-grow: 1;"> <p>Can you...</p> <p>Take care of yourself?</p> <p>Eat, dress, or use the toilet?</p> <p>Walk indoors around the house?</p> <p>Walk a block or 2 on level ground at 2 to 3 mph (2.3 to 4.8 kph)?</p> <p>Do light work around the house like dusting or washing dishes?</p> <p>Climb a flight of stairs or walk up a hill?</p> <p>Walk on level ground at 4 mph (6.4 kph)?</p> <p>Run a short distance?</p> <p>Do heavy work around the house like scrubbing floors or lifting or moving heavy furniture?</p> <p>Participate in moderate recreational activities like golf, bowling, dancing, doubles tennis, or throwing a baseball or football?</p> <p>Participate in strenuous sports like swimming, singles tennis, football, basketball, or skiing?</p> </div> </div>

kph indicates kilometers per hour, MET, metabolic equivalent; and mph, miles per hour.

*Modified from Hlatky et. al (11), copyright 1989, with permission from Elsevier, and adapted from Retcher et al (12).

Abbreviations and Acronyms

ACE-I – Angiotensin-Converting Enzyme Inhibitor

ARB – Angiotensin II Receptor Antagonist

ASA – Acetylsalicylic Acid

BMI – Body Mass Index

CBC – Complete Blood Count

CKD – Chronic Kidney Disease

Creat – Creatinine

CXR – Chest X-Ray

DM – Diabetes Mellitus

Gluc – Glucose

G&S – Group and Screen

HTN – Hypertension

INR – International Normalized Ratio

LFTs – Liver Function Tests

Lytes – Electrolytes

METS – Metabolic Equivalents

OSA – Obstructive Sleep Apnea

Pre-op - Preoperative

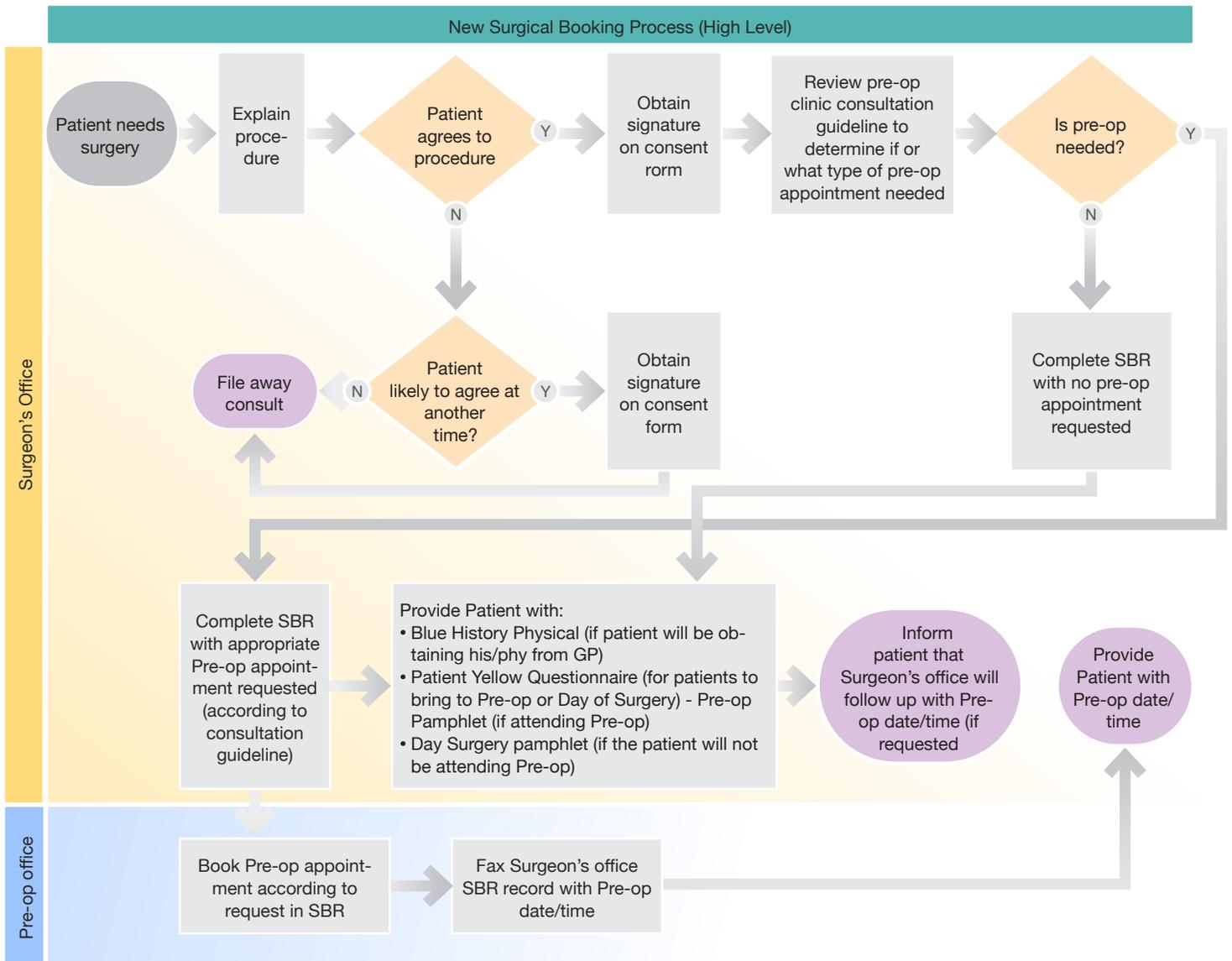
PTT – Partial Thromboplastin Time

/d – Per Day

Steps to implementation

- 1) Develop your CDT using evidence- and consensus- based criteria
- 2) Circulate CDT to key stakeholders and modify based on feedback
- 3) Use multiple avenues to inform staff about the CDT
 - Email updates
 - Posters to advertise CDT
 - Verbal updates at weekly hospital rounds and department meetings
 - Meetings/contact with referring surgeon's administrative staff
- 4) Build use of CDT into day-to-day processes, make it accessible and provide reminders (paper and electronic)

Sample Process Map for Surgical Booking



Source: North York General Hospital, Toronto.

PRE-OPERATIVE ORDERS
 FOR PATIENTS 18 YEARS OF AGE OR GREATER
 LABORATORY TESTS ARE VALID FOR 90 DAYS
 (if no changes in patient's health)
 WITH THE EXCEPTION OF CROSSMATCH/GROUP AND SCREEN
 VALID FOR 30 DAYS
 Please check appropriate boxes
 OS019

PRE-OP ASSESSMENT CLINIC ORDERS

CONSULTS:

(Please indicate reason for consult AND include all relevant reports with chart e.g. cardiology, respiratory, neurology etc.)

- Anesthesiology _____
- Internal Medicine _____
- CCAC
- Enterostomal
- Other _____

BOWEL PREPARATION:

(if yes, specify) _____

INVESTIGATIONS:

- Follow Standardized Testing Grid
- Number of cross-matched units: _____

Other:

- HbA1C βhCG
- Ferritin Sickle Cell screen

Hip arthroplasty (Xray pelvis with hip in 20 degree internal rotation and lateral of hip):

- Right Left

Knee arthroplasty (Xray knee):

- Right Left
- AP Lateral Skyline AP 4 feet standing

- Fax Rehabilitation papers to St. John's

- Other: _____

DAY OF SURGERY ORDERS

PREOPERATIVE ANTIBIOTIC:

- Vancomycin 500 mg IV 1hour pre-op
or
- Vancomycin 1000 mg IV 1 hour pre-op

ANTITHROMBOTICS:

(Anesthesiologist to administer anticoagulant in Operating Room)

- Compression stockings (TED)
- Other _____

SAME DAY INVESTIGATIONS:

- Glucose
- INR
- Other _____

- Repeat G&S if previous sample was taken ≥ 30 days ago

PREOPERATIVE ANALGESICS:

This section must be signed below

On arrival to Day Surgery

Acetaminophen 1000 mg PO x1

Celecoxib 200mg **or** 400mg POx1

Gabapentin 100mg 300mg **or** 600mg POx1

Other: _____

Physician Signature: _____

Date: _____

Time: _____

PHYSICIAN'S SIGNATURE (Applies to Pre-op clinic and or Day of Surgery orders except for the section on Pre-operative analgesics)

DATE:
TIME:

Posted by Pre-op Assessment Clinic Nurse:

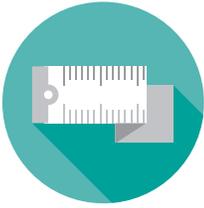
DATE:
TIME:

Posted by Day of Surgery Nurse:

DATE:
TIME:

Source: North York General Hospital, Toronto.

Note: "Follow standardized testing grid" box is pre-checked!



Measuring your performance

Choose a family of measures

The following are common measures used to evaluate appropriate selection of patients for pre-operative consultations and appropriate pre-operative investigations.

- 1) Primary measures: These are the main improvements that you are trying to achieve.
 - Number of patients attending pre-operative clinic (there should be a reduction in the number of lower-risk patients attending the clinic, and a resultant shift in the overall patient population of the clinic towards higher-risk categories. Thus, overall patient volumes may not necessarily decrease, but case-mix will change).
 - Number of investigations ordered in pre-operative clinic (these should decrease as only necessary investigations are ordered).
- 2) Process measures: These measures are developed to ensure that each aspect of the intervention is being carried out and delivered as intended.
 - Number of providers using the standardized criteria for patient selection
 - Number of providers using consensus criteria for pre-operative testing
- 3) Balancing measures: Any intervention may create new unintended consequences that need to be measured.
 - Number of re-scheduled or delayed procedures due to perceived missing investigations and/or sub-optimally worked-up medical conditions found on day of surgery

Determine a collection method

There are many ways to measure successful implementation of a CDT in your institution. Several methods can be used:

- A) Clinic Scheduling System (this can be used to provide further detail if the number of patients for each procedure type can be tracked)
 - Count the number of patients attending pre-operative clinic in a specified time frame and compare to number of patients attending clinic exactly one year prior
- B) Formal or Informal Surveys
 - Count the number of staff who are currently using the CDTs in their practice versus total staff surveyed
- C) Financial Evaluation
 - Consider a cost-savings analysis of potential money, time, resources, etc. saved from avoiding un-necessary clinical time and laboratory costs
 - Consider a costs-incurred evaluation of balancing measures outlined in step 3 above



Sustaining early successes

Once the intervention to reduce unnecessary visits and testing in the pre-operative clinic has been implemented and refined, there are several important ways to help sustain this performance.

- 1) The CDTs used to select patients for pre-operative clinic visits or appropriate pre-operative investigations should be easily accessible and built into day-to-day processes. This can be done by leveraging your order sheet to include a reminder and a copy of the CDT, and modifying processes to include your CDT.
- 2) Updating the CDT to ensure alignment with current evidence and guidelines over time will help promote best practices and continued use. Setting regular intervals for ongoing review is helpful in keeping the CDT up to date.



Additional resources

Health Quality Ontario, QI Tools & Resources

<https://quorum.hqontario.ca/en/Home/QI-Tools-Resources/QI-Essentials>

Institute for Healthcare Improvement, Model for Improvement

<http://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>



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