
Anesthesiology

Five Things Physicians and Patients Should Question

by

Canadian Anesthesiologists' Society

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

Conducting baseline laboratory investigations before low-risk non-cardiac surgery contributes little value to perioperative care. A focused clinical history and physical examination may reliably identify relevant abnormalities sought by routine laboratory testing before low-risk surgery. In addition, evidence suggests that abnormal results in this setting only rarely influence management and do not improve clinical outcomes. Preoperative testing may add value in the setting of a symptomatic patient or higher-risk surgery, but should not be performed routinely before low-risk surgery on asymptomatic patients.

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

Electrocardiograms (ECGs) performed before elective, non-cardiac, surgeries are frequently abnormal. This is especially true when this test is done in older patients. Despite the frequency of these abnormalities, ECGs do little to improve risk prediction beyond simply asking patients about their health. Serious cardiac events like heart attack are rare following low-risk surgeries; there is little that physicians can do to further lower this risk. A preoperative ECG will therefore not improve outcome but may lead to more testing or treatment that is of little benefit. ECGs used to identify the cause of symptoms (palpitations, chest pain, dyspnea, etc.) remain useful diagnostic tools regardless of whether the patient is having surgery.

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

While chest X-rays (CXRs) remain an important part of surgeon's evaluation before cancer or thoracic surgeries, it is better if these staging examinations are complete before committing a patient to surgery. CXRs are not indicated in the routine pre-anesthetic assessment. In the absence of symptoms, CXRs yield few diagnoses and many false positives. CXRs do not improve risk prediction or stratification. CXR in the pre-anesthetic evaluation should be reserved for patients with symptoms consistent with acute cardiopulmonary illness (dyspnea, wheeze, productive sputum, etc.).

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

Resting echocardiography has a clear role for resolving diagnostic questions in surgical patients, such as identifying the basis for suspicious systolic murmurs or new dyspnea on exertion. Outside these indications, resting echocardiography does not contribute significant additional prognostic information to usual clinical evaluation. It is not useful as a screening tool to identify surgical patients at risk for cardiac complications.

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

Stress testing can help resolve diagnostic uncertainty in surgical patients, such as determining whether individuals with chest discomfort and vascular risk factors have undiagnosed coronary artery disease. It can also help identify patients at elevated risk for cardiac complications after major vascular surgery. Nonetheless, asymptomatic individuals with good functional capacity have a very low risk of cardiac complications after low-to-intermediate non-cardiac surgery. Stress testing in such individuals is not useful for delineating expected perioperative risk and guiding clinical care.

How the list was created

The Canadian Anesthesiologists' Society (CAS) established its Choosing Wisely Canada (CWC) top 5 recommendations by engaging a small team of expert Canadian anesthesiologists to develop research methodology and carry out a survey to establish the CAS top five recommendations. The survey was based on similar work done by the American Society of Anesthesiologists who identified an evidence-based list of activities to question within anesthesiology as Five Things Physicians and Patients Should Question: American Society of Anesthesiologists. The CAS team defined a short list of twelve tests and procedures in perioperative care and asked members of the CAS to consider each and answer questions about their frequency of use, impact on quality of the care for patients, cost of the investigation, evidence to support the investigation and potential to avoid ordering the investigation. Five recommendations were selected through survey data collection and analysis by the CAS research team in conjunction with a professional survey consultant and expert consensus. The top five were presented at the CAS Annual Meeting in June 2015 and will be published in the Canadian Journal of Anesthesia.

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About the Canadian Anesthesiologists' Society

The CAS is the national specialty society for anesthesiology in Canada. The CAS was founded in 1943 as a not-for-profit, voluntary organization and is guided by its vision of innovative leadership and excellence in anesthesiology, perioperative care, and patient safety. The CAS represents 3,000 members (anesthesiologists, GP anesthetists, residents, Anesthesia Assistants, etc.) across Canada and around the world and is dedicated to promoting excellence in patient care through research, education and advocacy.



About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care.

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Five Things Physicians and Patients Should Question

1 Don't perform stress cardiac imaging or advanced non-invasive imaging in the initial evaluation of patients without cardiac symptoms unless high-risk markers are present.

Asymptomatic, low-risk patients account for up to 45 percent of unnecessary "screening". Testing should be performed only when the following findings are present: diabetes in patients older than 40-years-old; peripheral arterial disease; or greater than 2 percent yearly risk for coronary heart disease events.

2 Don't perform annual stress cardiac imaging or advanced non-invasive imaging as part of routine follow-up in asymptomatic patients.

Performing stress cardiac imaging or advanced non-invasive imaging in patients without symptoms on a serial or scheduled pattern (e.g., every one to two years or at a heart procedure anniversary) rarely results in any meaningful change in patient management. This practice may, in fact, lead to unnecessary invasive procedures and excess radiation exposure without any proven impact on patients' outcomes. An exception to this rule would be for patients more than five years after a bypass operation.

3 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.

Non-invasive testing is not useful for patients undergoing low-risk non-cardiac surgery (e.g., cataract removal). These types of tests do not change the patient's clinical management or outcomes.

4 Don't perform echocardiography as routine follow-up for mild, asymptomatic native valve disease in adult patients with no change in signs or symptoms.

Patients with native valve disease usually have years without symptoms before the onset of deterioration. An echocardiogram is not recommended yearly unless there is a change in clinical status.

5 Don't order annual electrocardiograms (ECGs) for low-risk patients without symptoms.

Don't obtain screening electrocardiogram testing in individuals who are asymptomatic and at low risk for coronary heart disease. In asymptomatic individuals at low risk for coronary heart disease (10-year risk <10%), screening for coronary heart disease with electrocardiography does not improve patient outcomes.

How the list was created

The Canadian Cardiovascular Society (CCS) established its *Choosing Wisely Canada* Top 5 recommendations by working closely with the American College of Cardiology (ACC). The ACC provided the CCS with the literature review, complete to 2009, that had informed their Top 5 recommendations. This provided a strong foundation for the CCS to begin its investigation into relevant Top 5 recommendations for cardiac care in the Canadian context. The CCS then conducted an extensive literature review to include all relevant publications since January 1, 2009. Moreover the CCS also included all relevant existing Canadian Guidelines, any Canadian appropriate use criteria and Canadian national or provincial policies that pertained to the five statements. The CCS then performed an extensive dissemination and consultation with its membership via email, Facebook, Twitter, the annual national meeting and webinars to ensure awareness and approval of the Top 5 recommendations. The first four items were adapted with permission from the *Five Things Physicians and Patients Should Question*. © 2012 American College of Cardiology. Item 5 was adapted with permission from the *Five Things Physicians and Patients Should Question*. © 2012 American College of Family Medicine.

Sources

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About *Choosing Wisely Canada*

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care.

For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Cardiovascular Society

The Canadian Cardiovascular Society (CCS) is a proud partner of the *Choosing Wisely Canada* campaign. CCS is the national voice for cardiovascular physicians and scientists. Its members include academic and community cardiologists, cardiac surgeons, pediatric cardiologists, trainees in those fields, researchers and other health care professionals working in cardiac sciences in all corners of the country. This represents over 2,000 members of the cardiovascular community in Canada. The CCS mission is to promote cardiovascular health and care through knowledge translation, including dissemination of research and encouragement of best practices and professional development, as well as leadership in health policy.

Five Things Clinicians and Patients Should Question

1 Don't start or continue life supporting interventions unless they are consistent with the patient's values and realistic goals of care.

Patients and their families often value the avoidance of invasive or overly aggressive life-sustaining measures when they are at the end of life. However, many dying patients receive aggressive life-sustaining therapies, in part due to clinicians' failures to elicit patients' preferences and to provide recommendations.

2 Don't prolong mechanical ventilation by over-use of sedatives and bed rest.

Maintaining critically ill patients in an immobile or minimally mobile state during care may potentiate muscle loss and deconditioning. Excessive and/or prolonged use of sedatives is associated with worse outcomes, including increased delirium, excessive use of diagnostic imaging for coma, increased number of tracheostomies, greater duration of mechanical ventilation and ICU length-of-stay.

3 Don't continue mechanical ventilation without a daily assessment for the patient's ability to breathe spontaneously.

Screening for readiness for liberation from mechanical ventilation with spontaneous breathing trials allows clinicians earlier recognition of patients that may be liberated from mechanical ventilation.

4 Don't order routine chest radiographs for critically ill patients, except to answer a specific clinical question.

Chest radiographs ("X-rays", CXRs) are not indicated for routine assessment of critically-ill patients except when indicated for specific procedures (e.g., endotracheal tube, naso- or orogastric tube, central vein catheter, pulmonary artery catheter, or other procedure requiring verification after insertion), or to provide information for a specific question related to a change in a patient's clinical condition, and if the information will likely impact a specific decision related to diagnosis or treatment.

5 Don't routinely transfuse red blood cells in hemodynamically stable ICU patients with a hemoglobin concentration greater than 70 g/L (a threshold of 80 g/L may be considered for patients undergoing cardiac or orthopedic surgery and those with active cardiovascular disease).

Unnecessary transfusion of red blood cells (RBCs) is more harmful than helpful, and wastes a limited resource, which should be reserved for patients with proven indications. Transfusing RBCs at a threshold higher than 70 g/L does not improve survival in ICU patients, and is associated with more complications and higher costs. This has been extensively studied and a restrictive transfusion strategy results in similar or lower mortality compared with higher thresholds, and other complications, including stroke and infections, may also be reduced.

How the list was created

The Choosing Wisely Canada list of recommendations relevant to critical care was assembled by a collaborative task force from Canadian Critical Care Society (CCCS), Canadian Association of Critical Care Nurses, Canadian Society of Respiratory Therapists and representatives from pharmacy, dietician and physiotherapy. The initial list of items were generated by task force, with support from CCCS Google groups. A modified Delphi method was used to retain 10 items from the initial list. A modified Delphi method was then used to generate domains of interest for ranking items and to select the final list of 5 items. Members of all collaborating societies were surveyed during the 2016 Canadian Critical Care Conference, and for 2 weeks afterwards. Items were modified after review of the survey and feedback from the Choosing Wisely Canada campaign leadership.

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About The Canadian Association of Critical Care Nurses

The Canadian Association of Critical Care Nurses (CACCN) is a proud partner of the Choosing Wisely Canada campaign. CACCN is a volunteer organization of critical care nurses. CACCN is the voice for excellence in Canadian critical care nursing. Their shared goal is promote quality patient- and family-centered care for Canadian's experiencing life threatening illness and injury.

About The Canadian Critical Care Society

The Canadian Critical Care Society (CCCS) is a proud partner of the Choosing Wisely Canada campaign. CCCS is the national specialty society, representing adult and paediatric critical care medicine physicians in Canada. The practice of critical care medicine in Canada is multidisciplinary and CCCS members hold base specialty certification in anaesthesia, medicine, paediatrics, emergency medicine or surgery and some surgical subspecialties such as cardiac surgery and neurosurgery.

About The Canadian Society of Respiratory Therapists

The Canadian Society of Respiratory Therapists (CSRT) is a proud partner of the Choosing Wisely Canada campaign. CSRT is the national professional association for respiratory therapists. Founded in 1964 as the Canadian Society of Inhalation Therapy Technicians, the CSRT is dedicated to excellence in cardiorespiratory care.

Ten Things Physicians and Patients Should Question

1 **Don't order CT head scans in adults and children who have suffered minor head injuries (unless positive for a validated head injury clinical decision rule).**

Head injuries in children and adults are common presentations to the emergency department. Minor head injury is characterized by: Glasgow Coma Scale (GCS) 13-15, associated with either witnessed loss of consciousness, definite amnesia, or witnessed disorientation. Most adults and children with minor head injuries do not suffer from serious brain injuries that require hospitalization or surgery. CT head scans performed on patients without signs of significant injuries can expose patients to unnecessary ionizing radiation that has the potential to increase patients' lifetime risk of cancer. They also increase length of stay and misdiagnosis. There is strong evidence that physicians should not order CT head scans for patients with minor head injury unless validated clinical decision rules suggest otherwise (i.e., Canadian CT head rule for adults, and CATCH or PECARN rules for children). Despite their validity, these rules are never 100% sensitive and are meant to assist and not replace, clinical judgement.

2 **Don't prescribe antibiotics in adults with bronchitis/asthma and children with bronchiolitis.**

Respiratory distress from bronchospasm/wheezing is a common presentation in both children (i.e., bronchiolitis) and adults (i.e., bronchitis/asthma) seen in the emergency department. Most patients with symptoms do not have bacterial infections that require antibiotic treatment or influence outcomes (i.e., hospitalization). Inappropriate administration of antibiotics can expose patients to unnecessary risks (i.e., allergies, rash, diarrhea and other side-effects) and has the potential to increase patients' risk of antibiotic induced diarrhea, including infections with *C. Difficile*. These prescriptions also increase overall antibiotic resistance in the community, and limit the effectiveness of standard antibiotics in the treatment of legitimate bacterial infections. There is strong applied research evidence to recommend that physicians should not prescribe antibiotics in children (i.e., bronchiolitis) and adults (i.e., bronchitis and asthma) with wheezing presentations.

3 **Don't order lumbosacral (low back) spinal imaging in patients with non-traumatic low back pain who have no red flags/pathologic indicators.**

Adults with non-specific lumbosacral (low back) pain, in the absence of significant trauma (i.e., car crash, acute axial loading, acute hyperflexion, etc.), commonly present to the emergency department. The evaluation of patients presenting with non-traumatic low back pain should include a complete focused history and physical examination to identify "red flags" that may indicate significant pathology. These may include, but are not limited to: features of cauda equina syndrome, weight loss, history of cancer, fever, night sweats, chronic use of systemic corticosteroids, chronic use of illicit intravenous drugs, patients with first episode of low back pain over 50 years of age and especially if over 65, abnormal reflexes, loss of motor strength or loss of sensation in the legs. In the absence of red flags, physicians should not order radiological images for patients presenting with non-specific low back pain. Imaging of the lower spine for symptomatic low back pain does not improve outcomes, exposes the patient to unnecessary ionizing radiation and contributes to flow delays without providing additional value.

4 **Don't order neck radiographs in patients who have a negative examination using the Canadian C-spine rules.**

Neck pain resulting from trauma (such as a fall or car crash) is a common reason for people to present to the emergency department. Very few patients have a cervical spinal injury that can be detected on radiographs ("X-rays"). History, physical examination and the application of clinical decision rules (i.e., the Canadian C-spine rule) can identify alert and stable trauma patients who do not have cervical spinal injuries and therefore do not need radiography. The Canadian C-spine rule has been validated and implemented successfully in Canadian centres, and physicians should not order imaging unless this rule suggests otherwise. Unnecessary radiography delays care, may cause increased pain and adverse outcomes (from prolonged spinal board immobilization), and exposes the patient to ionizing radiation without any possible benefit. This strategy will reduce the proportion of alert patients who require imaging.

5 **Don't prescribe antibiotics after incision and drainage of uncomplicated skin abscesses unless extensive cellulitis exists.**

Abscesses are walled off collections of pus in soft tissue, with *Staphylococcus aureus* (both sensitive and resistant to methicillin) being the microbe most frequently involved. Most uncomplicated abscesses should undergo incision in the emergency department using local analgesia or procedural sedation, complete drainage and appropriate follow-up. Evidence suggests that antibiotics are not routinely required after abscess incision and drainage of an uncomplicated abscess. Physicians should not prescribe antibiotics for these patients, unless the patients are immunocompromised, systemically ill, or exhibit extensive surrounding cellulitis or lymphangitis.

6 Don't order CT head scans in adult patients with simple syncope in the absence of high-risk predictors.

Patients commonly present to the emergency department with syncope. Syncope is a transient loss of consciousness followed by a spontaneous return to baseline neurologic function that does not require resuscitation. The evaluation of syncope should include a thorough history and physical exam to identify high-risk clinical predictors for CT head abnormalities. These high-risk predictors include, but are not limited to: trauma above the clavicles, headache, persistent neurologic deficit, age over 65, patients taking anticoagulants, or known malignancies. Many patients with syncope receive a CT scan of the head; however, in the absence of these predictors, a CT head is unlikely to aid in the management of syncope patients. CT scans can expose patients to unnecessary ionizing radiation that has the potential to increase patients' lifetime risk of cancer. Unwarranted imaging also increases length of stay and misdiagnosis.

7 Don't order CT pulmonary angiograms or VQ scans in patients with suspected pulmonary embolism until risk stratification with decision rule has been applied and when indicated, D-dimer biomarker results are obtained.

Many adults present to the emergency department with chest pain and/or shortness of breath. The majority of adult patients with these symptoms do not have a pulmonary embolism (PE) that requires investigation with a CT pulmonary angiogram (CTPA) or ventilation perfusion (VQ) lung scan. CTPAs or VQ scans expose patients to ionizing radiation that has the potential to increase patients' lifetime risk of cancer. CTPAs also place patients at risk for potential allergic reaction and acute kidney injury from the intravenous contrast required for the CTs. Imaging also increases length of stay and may contribute to misdiagnosis. Evidence demonstrate that physicians should not order CTPAs or VQ scans to diagnose PE until risk stratification with a clinical decision rule (Wells score, PERC rule) has been applied and d-dimer biomarker results are obtained for those patients where it is indicated. For high-risk populations in which the clinical decision rules have not been validated (i.e., pregnancy, hypercoagulability disorders), physicians are urged to exert their clinical judgment.

8 Don't use antibiotics in adults and children with uncomplicated sore throats.

Adults and children frequently present to the emergency department with sore throats (pharyngitis). The vast majority of cases of pharyngitis are caused by self-limiting viral infections that do not respond to antibiotics. The benefit of antibiotics for the approximately 10% of cases in adults (25% in children), caused by bacteria (principally Group A Streptococcus (GAS)) is modest at best, although is associated with fewer complications and a slightly shorter course of illness. There is strong evidence to suggest that antibiotics (penicillin, or 1st generation cephalosporin or macrolide if allergic to penicillin) should only be used in patients with high clinical prediction scores for GAS (CENTOR or FeverPAIN score), or intermediate clinical scores AND positive throat cultures. Rapid antigen detections tests do not offer advantage over clinical scores. Inappropriate administration of antibiotics can expose patients to unnecessary risks (i.e., allergies, rash and diarrhea), and increase overall antibiotic resistance in the community.

9 Don't order ankle and/or foot X-rays in patients who have a negative examination using the Ottawa ankle rules.

Foot and ankle injuries in children and adults are very common presentations to emergency departments. The Ottawa Ankle Rules (OAR) have been validated in both children (greater than 2 years old) and adult populations, and have been shown to reduce the number of X-rays performed without adversely affecting patient care. In alert, cooperative and sensate patients with blunt ankle and/or foot trauma within the previous ten days and who are not distracted by other injuries, only those who fulfill the OAR should undergo ankle and/or foot X-rays. Imaging of the ankle and/or foot in patients who are negative for the OAR does not improve outcomes, exposes the patient to unnecessary ionizing radiation and contributes to flow delays without providing additional value.

10 Don't use antibiotics in adults and children with uncomplicated acute otitis media.

Both adults and children commonly present to the emergency department with symptoms of a middle ear infection, or acute otitis media (AOM). The symptoms of AOM include fever, earache, discharge from ear, and/or decreased hearing. Evidence suggests that adults and children with uncomplicated AOM do not need antibiotics. Treatment should focus on analgesia and the use of antibiotics should be limited to complicated or severe cases. A watch and wait approach (analgesia and observation for 48 to 72 hours) should be considered for healthy, non-toxic appearing children older than six months of age with no craniofacial abnormalities, mild disease (mild otalgia, temperature < 39°C without antipyretics), and who have reliable medical follow-up. Antibiotics should be considered if the child's illness does not improve during the observation period, and for those children who are < 24 months of age with infection in both ears, and in those with AOM and ear discharge. Similarly, antibiotics should not be used for the initial treatment of uncomplicated AOM in adults. Delayed antibiotics are an effective alternative to immediate antibiotics to reduce antibiotic use. Inappropriate administration of antibiotics can expose patients to unnecessary risks (i.e., allergies, rash and diarrhea), and increase overall antibiotic resistance in the community.

How the list was created

The Canadian Association of Emergency Physicians (CAEP) established its Choosing Wisely Canada Top 10 (phase 1 and phase 2) recommendations by forming an Expert Working Group to generate an initial list of potentially overused tests, procedures, and treatments in emergency medicine that do not add value to care. CAEP subcommittee chairs were invited to provide further input to the initial list. The list of potential items was then sent to more than 100 selected emergency physicians to vote on the items based on: action-ability by emergency physicians, effectiveness, safety, economic burden, and frequency of use. The CAEP working group discussed the items with the highest votes, and the ten Choosing Wisely Canada recommendations were generated by consensus. The first five recommendations (items 1-5) were released in June 2015, and the second five recommendations (items 6-10) were released in October 2016.

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About Choosing Wisely Canada

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For more information on Choosing Wisely Canada or to see other lists of Things Clinicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Association of Emergency Physicians

The Canadian Association of Emergency Physicians (CAEP) is a proud partner of the Choosing Wisely Canada campaign. CAEP the primary advocacy, educational and medical organization representing the interests of Canadian emergency physicians, their work place issues and their patients. CAEP represents more than 2,000 emergency physicians across Canada. The CAEP head office is located in Ottawa, Ontario and CAEP is a founding member of the International Federation for Emergency Medicine (IFEM). The Association contributes to knowledge translation through the production of the Canadian Journal of Emergency Medicine (CJEM), the CAEP Road Shows and other CME activities, and the Annual CAEP Conference.

Five Things Physicians and Patients Should Question

1 Don't recommend routine or multiple daily self-glucose monitoring in adults with stable type 2 diabetes on agents that do not cause hypoglycemia.

Once target control is achieved and the results of self-monitoring become quite predictable, there is little gained in most individuals from repeatedly confirming this state. There are many exceptions, such as acute illness, when new medications are added, when weight fluctuates significantly, when A1c targets drift off course and in individuals who need monitoring to maintain targets. Self-monitoring is beneficial as long as one is learning and adjusting therapy based on the result of the monitoring.

2 Don't routinely order a thyroid ultrasound in patients with abnormal thyroid function tests unless there is a palpable abnormality of the thyroid gland.

Thyroid ultrasound is used to identify and characterize thyroid nodules, and is not part of the routine evaluation of abnormal thyroid function tests (over- or underactive thyroid function) unless the patient also has a large goiter or a lumpy thyroid. Incidentally discovered thyroid nodules are common. Overzealous use of ultrasound will frequently identify nodules, which are unrelated to the abnormal thyroid function, and may divert the clinical evaluation to assess the nodules, rather than the thyroid dysfunction. Imaging may be needed in thyrotoxic patients; when needed, a thyroid scan, not an ultrasound, is used to assess the etiology of the thyrotoxicosis and the possibility of focal autonomy in a thyroid nodule.

3 Don't use Free T4 or T3 to screen for hypothyroidism or to monitor and adjust levothyroxine (T4) dose in patients with known primary hypothyroidism.

T4 is converted into T3 at the cellular level in virtually all organs. Intracellular T3 levels regulate pituitary secretion and blood levels of TSH, as well as the effects of thyroid hormone in multiple organs. Therefore, in most people a normal TSH indicates either normal endogenous thyroid function or an adequate T4 replacement dose. TSH only becomes unreliable in patients with suspected or known pituitary or hypothalamic disease when TSH cannot respond physiologically to altered levels of T4 or T3.

4 Don't prescribe testosterone therapy unless there is biochemical evidence of testosterone deficiency.

Many of the symptoms attributed to male hypogonadism are commonly seen in normal male aging or in the presence of comorbid conditions. Testosterone therapy has the potential for serious side effects and represents a significant expense. It is therefore important to confirm the clinical suspicion of hypogonadism with biochemical testing. Current guidelines recommend the use of a total testosterone level obtained in the morning. A low level should be confirmed on a different day, again measuring the total testosterone. In some situations, a free or bioavailable testosterone may be of additional value.

5 Don't routinely test for Anti-Thyroid Peroxidase Antibodies (anti – TPO).

Positive anti-TPO titres are not unusual in the 'normal' population. Their presence in the context of thyroid disease only assists in indicating that the pathogenesis is probably autoimmune. As thyroid autoimmunity is a chronic condition, once diagnosed there is rarely a need to re-measure anti-TPO titres. In euthyroid pregnant patients deemed at high risk of developing thyroid disease, anti-TPO antibodies may influence the frequency of surveillance for hypothyroidism during the pregnancy. It is uncommon that measurement of anti-TPO antibodies influences patient management.

How the list was created

In 2013, the Canadian Society of Endocrinology and Metabolism (CSEM) created a Quality Improvement Committee and charged it with the task of collaborating with *Choosing Wisely Canada* to establish recommendations relevant to the care of endocrine and metabolic disorders. The committee has a membership of 8 practicing endocrinologists from across Canada and whose combined clinical experience is well in excess of 100 practice-years. A survey to solicit suggestions for areas of practice that would fit with CWC's mandate was sent to all members of CSEM. The results were discussed by the committee and grouped and crafted into a short list of recommendations (and examined for alignment with the US Choosing Wisely initiative). The recommendations list was also informed by data about utilization from parts of Canada and an understanding of the frequency with which endocrine disorders occur. The short list was then subjected to a modified Delphi process for ranking and the 5 recommendations selected had the highest mean priority score and the most consistency of opinion for committee members. They were finally agreed upon by consensus. Recommendations 1, 2, and 4 were adopted from the 2013 Five Things Physicians and Patients Should Question list with permission from the Endocrine Society.

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About The Canadian Society of Endocrinology and Metabolism

The Canadian Society of Endocrinology and Metabolism (CSEM) is a proud partner of the *Choosing Wisely Canada* campaign. CSEM is a professional organization bringing together academic and community-based endocrinologists and researchers engaged in providing health care, education and research within the broad domain of endocrinology. The CSEM is a national advocate for excellence in endocrinology research, education, and patient care, and its mandate is to advance the discipline of endocrinology and metabolism in Canada.

Eleven Things Physicians and Patients Should Question

1 Don't do imaging for lower-back pain unless red flags are present.

Red flags include, but are not limited to, severe or progressive neurological deficits or when serious underlying conditions such as osteomyelitis are suspected. Imaging of the lower spine before six weeks does not improve outcomes.

2 Don't use antibiotics for upper respiratory infections that are likely viral in origin, such as influenza-like illness, or self-limiting, such as sinus infections of less than seven days of duration.

Bacterial infections of the respiratory tract, when they do occur, are generally a secondary problem caused by complications from viral infections such as influenza. While it is often difficult to distinguish bacterial from viral sinusitis, nearly all cases are viral. Though cases of bacterial sinusitis can benefit from antibiotics, evidence of such cases does not typically surface until after at least seven days of illness. Not only are antibiotics rarely indicated for upper respiratory illnesses, but some patients experience adverse effects from such medications.

3 Don't order screening chest X-rays and ECGs for asymptomatic or low risk outpatients.

There is little evidence that detection of coronary artery stenosis in asymptomatic patients at low risk for coronary heart disease improves health outcomes. False positive tests are likely to lead to harm through unnecessary invasive procedures, over-treatment and misdiagnosis. Chest X-rays for asymptomatic patients with no specific indications for the imaging have a trivial diagnostic yield, but a significant number of false positive reports. Potential harms of such routine screening exceed the potential benefit.

4 Don't screen women with Pap smears if under 21 years of age or over 69 years of age.

- Don't do screening Pap smears annually in women with previously normal results
- Don't do Pap smears in women who have had a hysterectomy for non-malignant disease

The potential harm from screening women younger than 21 years of age outweighs the benefits and there is little evidence to suggest the necessity of conducting this test annually when previous test results were normal. Women who have had a full hysterectomy for benign disorders no longer require this screening. Screening should stop at age 70 if three previous test results were normal.

5 Don't do annual screening blood tests unless directly indicated by the risk profile of the patient.

There is little evidence to indicate there is value in routine blood tests in asymptomatic patients; instead, this practice is more likely to produce false positive results that may lead to additional unnecessary testing. The decision to perform screening tests, and the selection of which tests to perform, should be done with careful consideration of the patient's age, sex and any possible risk factors.

6 Don't routinely measure Vitamin D in low risk adults.

Because Canada is located above the 35° North latitude, the average Canadian's exposure to sunlight is insufficient to maintain adequate Vitamin D levels, especially during the winter. Therefore, measuring serum 25-hydroxyvitamin D levels is not necessary because routine supplementation with Vitamin D is appropriate for the general population. An exception is made for measuring Vitamin D levels in patients with significant renal or metabolic disease.

7 Don't routinely do screening mammography for average risk women aged 40 – 49. Individual assessment of each woman's preferences and risk should guide the discussion and decision regarding mammography screening in this age group.

If, after this careful assessment and discussion, a woman's breast cancer risk is not high, current evidence indicates that the benefit of screening mammography is small. Furthermore, for this age group there is a greater risk of false-positive screening results and consequently of undergoing unnecessary or harmful follow-up procedures. As always, clinicians need to be aware of changes in the balance of evidence on risk and benefit and support women in understanding this evidence. High quality materials to assist these discussions are available through the [Canadian Task Force on Preventive Health Care](#).

8 Don't do annual physical exams on asymptomatic adults with no significant risk factors.

A periodic physical examination has tremendous benefits; it allows physicians to check on their healthy patients while they remain healthy. However, the benefits of this check-up being done on an annual basis are questionable since many chronic illnesses that benefit from early detection take longer than a year to develop. Preventive health checks should instead be done at time intervals recommended by guidelines, such as those noted by the Canadian Task Force on the Periodic Health Examination.

9 Don't order DEXA (Dual-Energy X-ray Absorptiometry) screening for osteoporosis on low risk patients.

While all patients aged 50 years and older should be evaluated for risk factors for osteoporosis using tools such as the osteoporosis self-assessment screening tool (OST), bone mineral density screening via DEXA is not warranted on women under 65 or men under 70 at low risk.

10 Don't advise non-insulin requiring diabetics to routinely self-monitor blood sugars between office visits.

While self-monitoring of blood glucose (SMBG) for patients with diabetes is recommended by certain groups to help monitor glycemic control, for most adults with type II diabetes who are not using insulin, many studies have shown that routine SMBG does little to control blood sugar over time.

11 Don't order thyroid function tests in asymptomatic patients.

The primary rationale for screening asymptomatic patients is that the resulting treatment results in improved health outcomes when compared with patients who are not screened. There is insufficient evidence available indicating that screening for thyroid diseases will have these results.

How the list was created Recommendations 1 - 5

The Canadian Medical Association's (CMA) Forum on General and Family Practice Issues (GP Forum) is a collective of leaders of the General Practice sections of the provincial and territorial medical associations. To establish its Choosing Wisely Canada Top 5 recommendations, each GP Forum member consulted with their respective GP Section members to contribute candidate list items. Items from the American Academy of Family Physicians' Choosing Wisely® list were among the candidates. All candidate list items were collated and a literature search was conducted to confirm evidence-based support for the items. GP Forum members discussed which of the thirteen items that resulted should be included. Agreement was found on eight of them. Family physician members of the CMA's e-Panel voted to select five of the eight items. These five items were then approved by the provincial and territorial GP Sections. The College of Family Physicians of Canada is a member observer of the GP Forum and was involved in this list creation process. The first four items on this list are adapted with permission from the Five Things Physicians and Patients Should Question. © 2012 American Academy of Family Physicians.

Recommendations 6 - 11

Items 6 - 11 were selected from ten candidate items that were originally proposed for items 1 - 5. GP Forum members discussed which of these items should be included and agreement was found on eight of them. As was done for the first wave, family physician members of the CMA's e-Panel voted to select five of the eight items; however, subsequent discussions by the GP Forum resulted in six items being chosen. Feedback on these six items was then obtained from the provincial/territorial GP Sections. The College of Family Physicians of Canada is a member observer of the GP Forum and was involved in this list creation process.

The GP Forum was dissolved as of August 2015.

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About The CMA's Forum on General and Family Practice Issues

The Canadian Medical Association's (CMA) Forum on General and Family Practice Issues (GP Forum) is a proud partner of the Choosing Wisely Canada campaign. The GP Forum is a group of family physician leaders in every province and one territory (NWT) in Canada. These individuals are members or chairs of that jurisdiction's Section of General Practice. It also includes representation from the following organizations: the College of Family Physicians of Canada, the Canadian Medical Protective Association, the Society of Rural Physicians of Canada, Canadian Forces Health Services, the Canadian Association of Internes and Residents, the Canadian Federation of Medical Students and one CMA Board member who is a family physician. The primary purpose of the GP Forum is to provide expertise and advice to the CMA on issues concerning primary health care. Note: The GP Forum was dissolved as of August 2015.

About The College of Family Physicians of Canada

The College of Family Physicians of Canada (CFPC) is a proud partner of the Choosing Wisely Canada campaign. The CFPC represents more than 30,000 members across the country. It is the professional organization responsible for establishing standards for the training, certification and lifelong education of family physicians. The College provides quality services and programs, supports family medicine teaching and research, and advocates on behalf of family physicians and the specialty of family medicine. The CFPC accredits postgraduate family medicine training in Canada's 17 medical schools, undergraduate and continuing medical education and encourages the development of research in oncologic surgery. The CSSO believes in facilitating communication between surgeons whose primary interest lies in the field of oncology and encourages the formation of surgical oncology training programs among Canadian Universities.

About Choosing Wisely Canada

Choosing Wisely Canada 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.

For more information on Choosing Wisely Canada or to see other lists of Five Things Clinicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.



Five Things Physicians and Patients Should Question

1 Don't maintain long term Proton Pump Inhibitor (PPI) therapy for gastrointestinal symptoms without an attempt to stop/reduce PPI at least once per year in most patients.

PPIs are effective drugs for the treatment of gastro-esophageal reflux disease (GERD). Patients should always be prescribed the lowest dose of drug that manages their symptoms. Even though GERD is often a chronic condition, over time the disease may not require acid suppression and it is important that patients do not take drugs that are no longer necessary. For this reason patients should try stopping their acid suppressive therapy at least once per year. Patients with Barrett's esophagus, Los Angeles Grade D esophagitis, and gastrointestinal bleeding would be exempt from this.

2 Avoid using an upper GI series to investigate dyspepsia.

Upper GI series are often requested for the investigation of upper gastrointestinal symptoms. This investigation has a significant proportion of false positive and false negative results compared with endoscopy, and studies have consistently found that this is not a cost-effective approach compared to other strategies of managing dyspepsia.

3 Avoid performing an endoscopy for dyspepsia without alarm symptoms for patients under the age of 55 years.

Endoscopy is an accurate test for diagnosing dyspepsia, but organic pathology that does not respond to acid suppression or Helicobacter pylori eradication therapy is rare under the age of 55. Most guidelines therefore recommend as the first line approach for managing dyspepsia either empirical proton pump inhibitor therapy or a non-invasive test for Helicobacter pylori and then offering therapy if the patient is positive. If the patient has alarm features such as progressive dysphagia, anemia or weight loss, endoscopy may be appropriate.

4 Avoid performing a colonoscopy for constipation in those under the age of 50 years without family history of colon cancer or alarm features.

Constipation is a common problem and systematic review data suggests this is not an accurate symptom in diagnosing organic disease. If the patient is also under the age of 50 and does not have a family history of colon cancer and there are no alarm features such as anemia or weight loss, then the risk of colorectal cancer is very low and the risks of colonoscopy usually outweigh the benefits in these patients.

5 Don't routinely use long term steroid therapy in inflammatory bowel disease.

The risks of long term steroid therapy (therapy for more than 4 months and/or more than two courses in a year) outweigh any benefits in inflammatory bowel disease and should not be given to patients. Instead, they should be offered more effective maintenance therapy such as immunosuppression or biologic therapy that are safer and have more evidence for efficacy.

How the list was created

This list was created by polling the Canadian Association of Gastroenterology (CAG) Quality Leads on items that were felt to meet the goals of *Choosing Wisely Canada*. The five items were selected for being the most frequently identified and reflected common GI disorders managed by health care professionals. This list was then voted on by the CAG Quality Leads and the statements were further modified for language by the group.

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About Choosing Wisely Canada

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For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Association of Gastroenterology

The Canadian Association of Gastroenterology (CAG) is a proud partner of the *Choosing Wisely Canada* campaign. The CAG represents more than 1,100 members across Canada, including physicians, basic scientists, and affiliated health care providers who work in the field of gastroenterology. The CAG is a member-focused organization with a mission to support and engage in the study of the organs of the digestive tract in health and disease, as well as to promote and advance gastroenterology by providing leadership in patient care, research, teaching and continuing professional development.

General Surgery

Six Things Physicians and Patients Should Question

by

Canadian Association of General Surgeons

Last updated: April 2014



1 Don't perform axillary lymph node dissection for clinical stages I and II breast cancer with clinically negative lymph nodes without attempting sentinel node biopsy.

Sentinel node biopsy is proven effective at staging the axilla for positive lymph nodes and is proven to have fewer short and long term side effects, and in particular is associated with a markedly lower risk of lymphedema (permanent arm swelling). When the sentinel lymph node(s) are negative for cancer, no axillary dissection should be performed. When one or two sentinel nodes are involved with cancer that is not extensive in the node, the patient received breast conserving surgery and is planning to receive whole breast radiation and stage appropriate systemic therapy, axillary node dissection should not be performed.

2 Avoid the routine use of "whole-body" diagnostic computed tomography (CT) scanning in patients with minor or single system trauma.

Aggressive use of "whole-body" CT scanning improves early diagnosis of injury and may even positively impact survival in polytrauma patients. However, the significance of radiation exposure with these studies must be considered, especially in patients with low energy mechanisms of injury and absent physical examination findings consistent with major trauma.

3 Avoid colorectal cancer screening tests on asymptomatic patients with a life expectancy of less than 10 years and no family or personal history of colorectal neoplasia.

Screening for colorectal cancer has been shown to reduce the mortality associated with this common disease; colonoscopy provides the opportunity to detect and remove adenomatous polyps, the precursor lesion to many cancers, thereby reducing the incidence of the disease later in life. However, screening and surveillance modalities are inappropriate when the risks exceed the benefit. The risk of colonoscopy increases with increasing age and comorbidities. The risk/benefit ratio of colorectal cancer screening or surveillance for any patient should be individualized based on the results of previous screening examinations, family history, predicted risk of the intervention, life expectancy and patient preference.

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

Performing routine admission or preoperative chest X-rays is not recommended for ambulatory patients without specific reasons suggested by the history and/or physical examination findings. Only 2 percent of such images lead to a change in management. Obtaining a chest radiograph is reasonable if acute cardiopulmonary disease is suspected or there is a history of chronic stable cardiopulmonary diseases in patients older than age 70 who have not had chest radiography within six months.

5 Don't do computed tomography (CT) for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option.

Although CT is accurate in the evaluation of suspected appendicitis in the pediatric population, ultrasound is the preferred initial consideration for imaging examination in children. If the results of the ultrasound exam are equivocal, it may be followed by CT. This approach is cost-effective, reduces potential radiation risks and has excellent accuracy, with reported sensitivity and specificity of 94 percent in experienced hands. Recognizing that expertise may vary, strategies including improving diagnostic expertise in community based ultrasound and the development of evidence-based clinical decision rules are realistic goals in improving diagnosis without the use of CT scan.

6 Avoid repair of minimally symptomatic inguinal hernias where appropriate by offering an option of watchful waiting for up to two years.

Repair of minimally symptomatic inguinal hernias in adults can prevent potentially serious complications due to hernia incarceration. However, such repairs can also lead to complications such as infection, chronic inguinal pain and hernia recurrence which cumulatively approximate the risks of incarceration. Evidence shows that such hernias can also be managed with watchful waiting for up to 2 years after assessment, a choice that should be offered to appropriately selected persons.

How the list was created

The Canadian Association of General Surgeons (CAGS) established its Choosing Wisely Canada Top 5 recommendations by first having its Clinical Practice Committee review the American College of Surgeons (ACS) Choosing Wisely® list. Feeling confident that the American list reflected general surgery issues in Canada (addressing breast cancer diagnostics and treatment, colon cancer screening, trauma diagnostics and screening, admission and preoperative chest X-rays, and appendicitis diagnostics in children), the CAGS Clinical Practice Committee approved the list in principle. The list was then circulated to the CAGS Board and surgeons that specialized in each area were consulted. Ultimately, the first five items were adopted with permission from the Five Things Physicians and Patients Should Question, © 2013 American College of Surgeons. The CAGS Board also felt strongly about adding a sixth item to the list about the treatment of asymptomatic hernia and six items were then submitted for publication.

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About the Canadian Association of General Surgeons

With 2500 members, CAGS is the voice of the specialty of general surgery across Canada. CAGS supports the quality education, evidence-based research, and steadfast advocacy of general surgery so that its members can provide the best surgical care possible to Canadians.



About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care.

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Five Things Physicians and Patients Should Question

1 Don't use antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.

Cohort studies have found no adverse outcomes for older men or women associated with asymptomatic bacteriuria. Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects. Consensus criteria has been developed to characterize the specific clinical symptoms that, when associated with bacteriuria, define urinary tract infection. Screening for and treatment of asymptomatic bacteriuria is recommended before urologic procedures for which mucosal bleeding is anticipated.

2 Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia, agitation or delirium.

Large scale studies consistently show that the risk of motor vehicle accidents, falls and hip fractures leading to hospitalization and death can more than double in older adults taking benzodiazepines and other sedative-hypnotics. The number needed to treat with a sedative-hypnotic for improved sleep is 13, whereas the number needed to harm is only 6. Older patients, their caregivers and their health care providers should recognize these potential harms when considering treatment strategies for insomnia, agitation or delirium. Use of benzodiazepines should be reserved for alcohol withdrawal symptoms/delirium tremens or severe generalized anxiety disorder unresponsive to other therapies. Prescribing or discontinuing sedative-hypnotics in hospital can have substantial impact on long-term use. Cognitive behavioural therapy, brief behavioural interventions and benzodiazepine-tapering protocols have proven benefit in sedative-hypnotic discontinuation. These non-pharmacologic interventions are also beneficial in improving sleep.

3 Don't recommend percutaneous feeding tubes in patients with advanced dementia; instead offer oral feeding.

Careful hand-feeding for patients with severe dementia is at least as good as tube-feeding for the outcomes of death, aspiration pneumonia, functional status and patient comfort. Food is the preferred nutrient. Use of oral nutritional supplements may be beneficial. Tube-feeding is associated with agitation, increased use of physical and chemical restraints and worsening pressure ulcers.

4 Don't use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia.

People with dementia often exhibit aggression, resistance to care and other challenging or disruptive behaviours. In such instances, antipsychotic medicines are often prescribed, but they provide limited benefit and can cause serious harm, including premature death. Use of these drugs should be limited to cases where non-pharmacologic measures have failed and patients pose an imminent threat to themselves or others. Identifying and addressing causes of behaviour change can make drug treatment unnecessary.

5 Avoid using medications known to cause hypoglycemia to achieve hemoglobin A1c <7.5% in many adults age 65 and older; moderate control is generally better.

There is no evidence that using medications to achieve intense glycemic control in older adults with type 2 diabetes is beneficial (A1c under 7.0%). Among non-older adults, except for long-term reductions in myocardial infarction and mortality with metformin, using medications to achieve glycated haemoglobin levels less than 6 % is associated with harms, including higher mortality rates. Intense control has been consistently shown to produce higher rates of hypoglycemia in older adults. Given the long timeframe (approximately 8 years) to achieve theorized benefits of intense control, glycemic targets should reflect patient goals, health status, and life expectancy. Reasonable glycemic targets would be 7.0 – 7.5% in healthy older adults with long life expectancy, 7.5 – 8.0% in those with moderate comorbidity and a life expectancy < 10 years, and 8.0 – 8.5% in those with multiple morbidities and shorter life expectancy.

How the list was created

The Canadian Geriatrics Society (CGS) established its *Choosing Wisely Canada* Top 5 recommendations by first establishing a small group of its Council members and Committee chairs to evaluate the American Geriatrics Society (AGS) *Choosing Wisely*® list. Feeling confident that the AGS recommendations reflected geriatric care in Canada, the list was presented to the CGS executive. After initial review by the CGS executive, each topic was reviewed in detail by selected Canadian geriatricians and other specialists with the relevant research and clinical expertise. This process was undertaken to ensure the recommendations and background information for each topic were valid and relevant for Canadian patients and our health care system. Ultimately, all five items were adopted with permission from the *Five Things Physicians and Patients Should Question*. © 2012 American Geriatrics Society

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About Choosing Wisely Canada

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About The Canadian Geriatrics Society

The Canadian Geriatrics Society (CGS) is a proud partner of the *Choosing Wisely Canada* campaign. The CGS has 375 members who have an interest in the health care of the elderly. This includes specialists in geriatrics and care of the elderly, family physicians and allied health professionals. The objectives of the CGS are to promote excellence in the medical care of older Canadians, promote a high standard of research in the field of geriatrics/gerontology and improve the education provided to Canadian physicians on aging and its clinical challenges.

Four Things Physicians and Patients Should Question

1 Don't order neuroimaging or sinus imaging in patients who have a normal clinical examination, who meet diagnostic criteria for migraine, and have no "red flags" for a secondary headache disorder.

Red flags for a secondary headache include thunderclap onset, fever and meningismus, papilloedema, unexplained focal neurological signs, unusual headache attack precipitants, and headache onset after age 50. The yield of neuroimaging in patients with typical recurrent migraine attacks is very low. Any imaging study, particularly MRI, can identify incidental findings of no clinical significance which may lead to patient anxiety and further unnecessary investigation. For patients with typical migraine and a normal clinical examination who desire reassurance, careful explanation of the diagnosis and patient education may be more advisable.

2 Don't prescribe opioid analgesics or combination analgesics containing opioids or barbiturates as first line therapy for the treatment of migraine.

Non-steroidal anti-inflammatory drugs and triptans are recommended first line treatments for acute migraine therapy. Opioids may produce increased sensitivity to pain and increase the risk that intermittent headache attacks will become more frequent and escalate to a chronic daily headache syndrome (medication overuse headache), particularly when opioids are used on 10 days a month or more. Opioids may impair alertness and produce dependence or addiction syndromes.

3 Don't prescribe acute medications or recommend an over-the-counter analgesic for patients with frequent migraine attacks without monitoring frequency of acute medication use with a headache diary.

All acute medications used for migraine attacks, when used too frequently, increase the risk of medication overuse headache with progression to a chronic daily headache syndrome. Use of opioids, triptans, ergotamines, or combination analgesics of any kind on 10 days a month or more, and use of NSAIDs or acetaminophen on 15 days a month or more places patients at risk for medication overuse headache. Patients with migraine should be educated with regard to these risks.

4 Don't forget to consider the behavioural components of migraine treatment, including lifestyle issues like regular and adequate meals and sleep, and management of specific triggers including stress.

Lifestyle issues and specific trigger management can contribute considerably to successful migraine control. Patient education regarding these factors may reduce the need for expensive medications and reduce indirect costs related to disability. Training in relaxation and other stress management techniques should be considered. Training in other skills like pacing activities to help patients manage their schedules and stress levels well, and how to take acute medications appropriately are also important.

How the list was created

The Canadian Headache Society (CHS) executive agreed to participate in the *Choosing Wisely Canada* campaign. A list of potential statements for *Choosing Wisely Canada* was created through email discussion among the executive, and input was then sought from other CHS directors. The refined statement list was then brought to the June 2015 Annual General Meeting of the Society where they were discussed and further input was obtained. Following this, draft versions were circulated and refined among the CHS executive and directors, and a final version was produced with the assistance of individuals from the *Choosing Wisely Canada* campaign.

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About The Canadian Headache Society

The Canadian Headache Society (CHS) is a proud partner of the *Choosing Wisely Canada* campaign. The CHS is an incorporated non-profit organization of health professionals which has as its objectives the promotion of education, research and excellence in patient care in the field of headache medicine in Canada.

Five Things Physicians and Patients Should Question

1 **Don't give IVIG as first line treatment for patients with asymptomatic immune thrombocytopenia (ITP).**

Treatment for ITP is recommended for a platelet count less than $30 \times 10^9/L$. Corticosteroids are considered first-line treatment, with the addition of IVIG reserved for severe ITP and bleeding, when a rapid rise in platelets is required, or when corticosteroids are contraindicated. There is no evidence of benefit of IVIG in combination with corticosteroids for first-line treatment of asymptomatic ITP. Unnecessary IVIG infusions can result in multiple adverse effects, including acute hemolytic or anaphylactic reactions, infections, thromboembolic events, and aseptic meningitis.

2 **During interruption of warfarin anticoagulation for procedures, don't 'bridge' with full-dose low molecular weight heparin (LMWH) or unfractionated heparin (UFH) unless the risk of thrombosis is high.**

Patients on warfarin with a low-risk for thrombotic events do not require bridging anticoagulation. If interruption is necessary, warfarin can be stopped 5 days prior to a planned procedure and resumed when it is felt to be safe to do so afterwards. Bridging with LMWH or UFH has been shown to cause excess bleeding when compared with no bridging and may ultimately delay resumption of warfarin. High-risk patients (e.g. mechanical mitral valve, venous thromboembolism within the last 3 months or atrial fibrillation with recent stroke/TIA) should be considered for bridging if the risk of thrombosis is higher than the risk of peri-procedural bleeding.

3 **Don't order thrombophilia testing in women with early pregnancy loss.**

Early pregnancy losses are common amongst healthy women. Current guidelines do not support the routine screening of women with pregnancy loss for inherited thrombophilias. Moreover, there are recommendations against instituting thromboprophylaxis in women with inherited thrombophilias wishing to achieve a successful term pregnancy. By performing testing for inherited thrombophilias, patients may be unnecessarily exposed to the harms of thromboprophylaxis, inappropriately labeled with a disease-state, and may unnecessarily modify future plans for travel, pregnancy or surgery based on detection of an "asymptomatic" thrombophilia. Further, patients with negative testing may receive false reassurance.

4 **Don't request a fine-needle aspirate (FNA) for the evaluation of suspected lymphoma.**

The diagnosis of lymphoma requires specimens with intact cellular architecture for accurate histopathologic and immunophenotypic classification. FNA is associated with a low sensitivity and potentially results in delays in lymphoma diagnosis. Although excisional biopsy is the gold standard for lymphoma diagnosis, depending on the lymph node location, excisional biopsy may be associated with complications and the need for general anesthesia. At a minimum, an imaging-guided core biopsy should be obtained to improve the accuracy and timeliness of lymphoma diagnosis.

5 **Don't transfuse patients based solely on an arbitrary hemoglobin threshold.**

Decisions to transfuse should be based on assessment of an individual patient including their underlying cause of anemia. There is high quality evidence that demonstrates a lack of benefit and, in some cases, harm to patients transfused to achieve an arbitrary transfusion threshold. If necessary, transfuse only the minimum number of units required instead of a liberal transfusion strategy. Risks of red blood cell transfusions include allergy, fever, infections, volume overload and hemolysis.

How the list was created

The entire membership of the Canadian Hematology Society (CHS) was asked to submit potential *Choosing Wisely Canada* list items. A steering committee consisting of 8 self-nominated CHS members was then formed. Next, the committee identified items for potential inclusion in the final list based on principles from the American Society of Hematology Choosing Wisely campaign and *Choosing Wisely Canada*. These principles included that the recommendations should aim to reduce harm, be evidence-based, reduce strain on the health care system, focus on common tests, procedures or treatments and be within the clinical domain of members of the CHS. Items that were felt by at least 5 of the 7 committee members (the chairperson remained neutral) for potential inclusion were selected for evidence review. Members could opt out of voting on a particular item if they felt it was outside of their scope of practice. Thirty-eight items were suggested by the membership-at-large and 12 items were selected for evidence review. Health Quality Ontario and the Canadian Agency for Drugs and Technologies in Health performed the literature searches. It was determined that expert recommendations could be a suitable evidence-base if the other principles were maintained. If a relevant clinical practice guideline was identified, it was reviewed to ensure congruence with the final recommendations. If disagreements were found, the input of relevant Canadian experts was sought. The agencies performing the literature reviews generated an evidence summary for each potential list item. Using the evidence summaries, a review of clinical practice guidelines and application of our principles, the 12-item list was then narrowed to the final 5-item list based on the committee's ranking.

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About The Canadian Hematology Society

The Canadian Hematology Society (CHS) is a proud partner of the *Choosing Wisely Canada* campaign. CHS is a professional association founded in 1971, whose membership includes most of the hematologists in Canada. The main goals of CHS are to maintain the integrity and vitality of the specialty of hematology, by participating with the Royal College of Physicians and Surgeons of Canada in designing training programs for our successors, encouraging and rewarding scholarly research, and providing a forum for communication and mutual support for all of our colleagues in both community and academic settings.

Five Things Physicians and Patients Should Question

1 Don't order serum ammonia to diagnose or manage hepatic encephalopathy (HE).

High blood-ammonia levels alone do not add any diagnostic, staging, or prognostic value in HE patients known to have chronic liver disease.

2 Don't routinely transfuse fresh frozen plasma, vitamin K, or platelets to reverse abnormal tests of coagulation in patients with cirrhosis prior to abdominal paracentesis, endoscopic variceal band ligation, or any other minor invasive procedures.

Routine tests of coagulation do not reflect bleeding risk in patients with cirrhosis and bleeding complications of these procedures are rare.

3 Don't order HFE genotyping based on serum ferritin values alone to diagnose hereditary hemochromatosis.

Serum ferritin values reflect an increase in hepatic iron content and have a significant false positive rate because of elevations due to inflammation. Thus, in patients with evidence of liver disease, hemochromatosis genotyping should only be performed among individuals with an elevated ferritin and fasting transferrin saturation >45% (TSat) or a known family history of HFE-associated hereditary hemochromatosis.

4 Don't perform computed tomography (CT) or magnetic resonance imaging (MRI) routinely to monitor benign focal liver lesions (e.g., focal nodal hyperplasia, hemangioma).

Patients with benign focal liver lesions who do not have underlying liver disease and have demonstrated clinical (asymptomatic) and radiologic stability do not need repeated imaging as the likelihood of evolving into neoplastic lesions is very low. In contrast, patients with radiologic evidence of hepatocellular adenoma may have an increased risk of complications and/or neoplasia thus warranting closer observation.

5 Don't repeat hepatitis C viral load testing in an individual who has established chronic infection, outside of antiviral treatment.

Highly sensitive quantitative assays of hepatitis C RNA are appropriate at the time of diagnosis (to confirm infection) and as part of antiviral therapy, which is typically at the beginning and after therapy is completed to confirm sustained virological response at week 12 (SVR 12). Outside of these circumstances the results of virologic testing do not change clinical management or outcomes.

How the list was created

The Canadian Association for the Study of Liver Disease (CASL) established a Choosing Wisely Task force in November 2015 to develop its list of recommendations felt to meet the goals of Choosing Wisely Canada. Members of this group were selected from the CASL Education Committee to broadly represent varying practice settings and subspecialty expertise within the field of Hepatology. Hepatologists with methodological experience in evidence-based medicine were also included. The working group solicited recommendations from CASL membership that should be considered for inclusion in the list of “Five Things Physicians and Patients Should Question”. Fifteen recommendations were then rated based upon judgments related to harm, benefit and excess resource utilization. Based on working group voting and literature review, a total of eight suggestions were identified with subsequent voting by CASL membership to generate the final top five recommendations. These recommendations were submitted and approved by CASL Governing Board and Choosing Wisely Canada.

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About the Canadian Association for the Study of Liver Diseases

The Canadian Association for the Study of Liver Diseases (CASL) is a proud partner of the Choosing Wisely Canada campaign. CASL is a non-profit organization that seeks to eliminate liver disease through research, education and advocacy. The membership includes hepatologists, gastroenterologists, pathologists, pediatricians, radiologists, scientists, surgeons, trainees and other interested people.

Five Things Physicians and Patients Should Question

1 Don't place or leave in place a urinary catheter without reassessment.

The use of urinary catheters among hospitalized patients is common. Urinary catheter use is associated with preventable harm such as, catheter-associated urinary tract infection, sepsis, and delirium. Guidelines support routine assessment of the indications for urinary catheters and minimizing their duration of use. Appropriate indications include acute urinary obstruction, critical illness and end-of-life care. Strategies that reduce inappropriate use of urinary catheters have been shown to reduce health care associated infections.

2 Don't prescribe antibiotics for asymptomatic bacteriuria (ASB) in non-pregnant patients.

The inappropriate treatment of ASB represents a leading misuse of antimicrobial therapeutics. Clinicians should avoid the use of antibiotics given the lack of treatment benefits, risk of potential harm such as *Clostridium difficile* infections and the emergence of antimicrobial resistant organisms. The majority of hospitalized patients with ASB do not require antibiotics with the exception of pregnant women, and patients undergoing invasive urologic surgical procedures. In all other situations, antimicrobial therapy should be targeted to those who have symptoms of urinary tract infections in the presence of bacteriuria.

3 Don't use benzodiazepines and other sedative-hypnotics in older adults as first choice for insomnia, agitation or delirium.

Insomnia, agitation, and delirium commonly occur among elderly inpatients, and hospital providers frequently prescribe pharmacological sleep aids or sedatives. However, studies in older adults have shown that benzodiazepines and other sedative-hypnotics significantly increase the risk of morbidity (such as falls, delirium and hip fractures) and mortality. Use of these drugs should be avoided as first line treatment for the indications of insomnia, agitation, or delirium. Instead, other non-pharmacological alternatives should be considered first.

4 Don't routinely obtain neuro-imaging studies (CT, MRI scans, or carotid Doppler ultrasonography) in the evaluation of simple syncope in patients with a normal neurological examination.

Syncope is common and has been defined as transient loss of consciousness, associated with inability to maintain postural tone and with immediate, spontaneous and complete recovery. Patients presenting with transient loss of consciousness due to neurological causes (such as seizures and stroke) are infrequent and must be differentiated from true syncope. While neurological disorders can occasionally result in transient loss of consciousness, the utility of neuro-imaging studies are of limited benefit in the absence of signs or symptoms concerning for neurological pathologies.

5 Don't routinely obtain head computed tomography (CT) scans, in hospitalized patients with delirium in the absence of risk factors.

Delirium is a common problem among hospitalized patients. In the absence of risk factors for intracranial causes of delirium (such as recent head trauma or fall, new focal neurological findings, and sudden or unexplained prolonged decreased level of consciousness), routine head CT scans are of low diagnostic yield. Guidelines suggest a step-wise approach to the management of new delirium in hospitalized patients and consideration of head CT only in patients with select risk factors.

How the list was created

The Canadian Society for Hospital Medicine (CSHM) established its *Choosing Wisely Canada* (CWC) Top 5 recommendations by creating a CWC subcommittee within its Quality Improvement (QI) Committee. The subcommittee members represent a diverse group of hospitalists from across Canada, practicing in a variety of settings. A draft list of 16 recommendations was solicited from the broader CSHM membership via email and society website. Members were asked to consider relevance to hospital medicine, frequency of occurrence and potential for harm. The QI Committee vetted each recommendation and conducted a literature review to determine the strength of the supporting evidence. Recommendations lacking in evidence were removed from the list. All CSHM members were invited to rank the remaining 12 items using an anonymous electronic web-based survey tool. The top 9 recommendations with the highest scores were selected for a second round of voting in which the scores from the first round of voting were revealed to participants. The top 5 recommendations with the highest degree of agreement were selected and submitted to the Board of Directors for approval as the final list.

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About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care.

For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Society of Hospital Medicine

The Canadian Society of Hospital Medicine (CSHM) is a proud partner of the *Choosing Wisely Canada* campaign. CSHM was founded in 2001 as the Canadian chapter of the US based Society of Hospital Medicine. The CSHM is committed to promoting the highest quality of care for all hospitalized patients. The CSHM supports Canadian hospitalists promoting excellence in the practice of hospital medicine through education, advocacy and research.

Five Things Physicians and Patients Should Question

1 Don't routinely prescribe intravenous forms of highly bioavailable antimicrobial agents for patients who can reliably take and absorb oral medications.

Antimicrobials such as fluoroquinolones, trimethoprim-sulfamethoxazole, clindamycin, linezolid, metronidazole and fluconazole have excellent bioavailability and only rarely need to be administered intravenously. Use of oral formulations of these medications reduces the need for placement and maintenance of venous access devices and their associated complications.

2 Don't prescribe alternate second-line antimicrobials to patients reporting non-severe reactions to penicillin when beta-lactams are the recommended first-line therapy.

Reported penicillin reactions frequently result in the use of alternate second-line agents that may be clinically inferior or may pose increased risks to patients resulting in longer lengths of stay and increased costs of care. Alternate broad-spectrum agents may also result in increased rates of adverse events and selection for antimicrobial resistance. Therefore, it is important to obtain a detailed history of a patient's reported prior reaction to penicillin to determine whether beta-lactam therapy can be safely administered.

3 Don't routinely repeat CD4 measurements in patients with HIV infection with HIV-1 RNA suppression for >2 years and CD4 counts >500/ μ L, unless virologic failure occurs or intercurrent opportunistic infection develops.

The 2014 recommendations of the International Antiviral Society – US Panel state that measurement of CD4 count is optional among patients with suppressed viral loads for >2 years and CD4 counts >500/ μ L. CD4 measurement in these patients is of low-value and may create unnecessary patient concern in response to normal variation of CD4 counts. In prospective studies of patients who have responded to antiretroviral therapy with HIV-1 RNA suppression and rises in CD4 cell count >200 cells/ μ L, there was little clinical benefit from continued routine measurement of CD4 counts.

4 Don't routinely repeat radiologic imaging in patients with osteomyelitis demonstrating clinical improvement following adequate antimicrobial therapy.

There is poor correlation between clinical response and resolution of findings on magnetic resonance imaging (MRI), computed tomography (CT), and nuclear studies in patients with osteomyelitis. Because radiologic resolution may lag behind clinical improvement, repeat imaging may lead to unnecessary prolongation of antimicrobial therapy. Repeat imaging is indicated in cases where there is a lack of clinical response, progression of clinical findings, or the presence of an undrained abscess on the initial scan.

5 Don't prescribe aminoglycosides for synergy to patients with bacteremia or native valve infective endocarditis caused by *Staphylococcus aureus*.

The addition of an aminoglycoside such as gentamicin to beta-lactam therapy or vancomycin for treatment of bacteremia or native valve infective endocarditis caused by *Staphylococcus aureus* has not been demonstrated to improve clinical outcomes. This practice may result in adverse effects including acute kidney injury and ototoxicity. The addition of gentamicin is still recommended in cases of prosthetic valve endocarditis caused by *Staphylococcus aureus*.

How the list was created

The Association of Medical Microbiology and Infectious Disease (AMMI) Canada established its Choosing Wisely Canada list of “Five Things that Physicians and Patients Should Question” by convening a Working Group of 14 members representing a diverse group of Infectious Diseases specialists from multiple geographical regions, practice settings and institution types, with varying years in practice. Following a survey of AMMI Canada membership to identify low-value practices within Infectious Diseases, the Working Group developed a list of 23 declarative statements. In an iterative process, Working Group members were invited to rank and comment on all recommendations online. Practices that met the following four criteria received highest ranking: (i) within the purview of Infectious Diseases practice; (ii) frequently encountered in practice; (iii) significant potential for uptake by other physicians and societies; and (iv) likely to have significant overall impact on the value of care provided by the members of our profession. The Top Five list was shared with AMMI Canada membership electronically and during a national open forum at the AMMI Canada – CACMID Annual Conference held on April 18, 2015, in Charlottetown, PEI, to obtain feedback. Following minor refinements, the AMMI Canada Executive Council and Guidelines Committee provided full endorsement and support for the final list.

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About The Association of Medical Microbiology and Infectious Disease Canada

The Association of Medical Microbiology and Infectious Disease Canada (AMMI) is a proud partner of the Choosing Wisely Canada campaign. AMMI Canada is the national association that represents physicians, clinical microbiologists and researchers specializing in the fields of medical microbiology and infectious diseases. Through promotion of the diagnosis, prevention and treatment of human infectious diseases and by our involvement in education, research, clinical practice and advocacy, AMMI Canada aims to serve and educate the public and also to enhance the career opportunities of its members through professional development and advocacy initiatives.

Five Things Physicians and Patients Should Question

1 Don't use steroids (e.g., prednisone) for maintenance therapy in inflammatory bowel disease (IBD).

While systemic corticosteroids (e.g., prednisone) are effective in inducing symptomatic remission in IBD, they are ineffective as maintenance therapy and are associated with both short- and long-term serious adverse effects. Consequently, if the initial steroid taper is unsuccessful or more than two courses of steroids are required within a year, health providers should consider adding a steroid-sparing agent that has proven efficacy and safety as maintenance therapy in IBD patients.

2 Don't use opioids long-term to manage abdominal pain in inflammatory bowel disease (IBD).

While opioids may be used to manage abdominal pain in select acute settings in IBD patients, their prolonged use may mask the symptoms of active IBD or its complications (e.g., bowel perforation or megacolon). Chronic opioid use has been proven ineffective for non-malignancy associated chronic pain and is associated with excess mortality. Moreover, because of their potential risk for dependence, their long-term use for managing IBD-related abdominal pain should be avoided especially in the context of the opioid crisis in North America.

3 Don't unnecessarily prolong the course of intravenous corticosteroids in patients with acute severe ulcerative colitis (UC) in the absence of clinical response.

Non-response to intravenous corticosteroids for acute severe UC can be predicted after the first 72 hours of treatment. However, about a third of non-responders receive systemic steroid monotherapy beyond 7 days. This prolonged use of ineffective systemic steroids may unnecessarily lengthen hospitalization days and increase risk of postoperative complications in those who eventually require colectomy.

4 Don't initiate or escalate long-term medical therapies for the treatment of inflammatory bowel disease (IBD) based only on symptoms.

Clinical symptoms often prompt initiation or escalation of medical treatments for inflammatory bowel disease (IBD). However, functional bowel disorders (e.g. irritable bowel syndrome) coexist in 20% of IBD patients and can mimic symptoms of the latter. Clinical symptoms, in fact, do not correlate well with IBD disease activity. Consequently, relying on only clinical symptoms without confirming active disease may commit patients to long-term treatments that have potentially significant adverse effects and resource implications.

5 Don't use abdominal computed tomography (CT) scan to assess inflammatory bowel disease (IBD) in the acute setting unless there is suspicion of a complication (obstruction, perforation, abscess) or a non-IBD etiology for abdominal symptoms.

Abdominal CT scanning is effective for the time-sensitive diagnosis of IBD complications such as obstruction, perforation, or non-IBD related causes of abdominal pain when these are suspected. The effective ionizing radiation dose from a single conventional abdominal CT scan (10-20mSv) is within acceptable safety limits (<50mSv). However, minimizing inappropriate utilization of CT is a priority because repeated exposure to ionizing radiation over a lifetime, particularly among younger IBD patients, may potentially increase the risk of malignancy. In the acute setting (e.g., emergency department), abdominal CT scan should only be used when there is suspicion of a complication of IBD and should not be used for the assessment of disease activity.

How the list was created

The recommendation list was developed by the Canadian IBD Network for Research and Growth in Quality Improvement (CINERGI) in collaboration with Crohn's and Colitis Canada (CCC) and the Canadian Association of Gastroenterology (CAG). The CINERGI group comprises 14 gastroenterologists specialized in the care of inflammatory bowel disease representing 12 academic centres across Canada. A preliminary survey was sent to the CINERGI working group to solicit candidate recommendations. The top 10 recommendations were selected by the working group members through an online voting platform. During a face-to-face consensus meeting in Toronto on November 4, 2016 that included CINERGI working group members, 2 radiologists, representatives from CCC and CAG, and 2 patient representatives, a modified Delphi process was used to select the top 5 recommendations. This list was submitted to the CAG Quality Affairs Committee, the Executive Board, and the CAG general membership for feedback and approval.

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About Crohn's and Colitis Canada

Crohn's and Colitis Canada is a proud partner of the Choosing Wisely Canada campaign. Crohn's and Colitis Canada is the only national, volunteer-based charity focused on finding the cures for Crohn's disease and ulcerative colitis and improving the lives of children and adults affected by these diseases. Crohn's and Colitis Canada focuses on transforming the lives of people affected by Crohn's and colitis (the two main forms of inflammatory bowel disease) through research, patient programs, advocacy, and awareness.

About the Canadian IBD Network for Research and Growth in Quality Improvement

The Canadian IBD Network for Research and Growth in Quality Improvement (CINERGI) is a proud partner of the Choosing Wisely Canada campaign. CINERGI is a research network of 14 inflammatory bowel disease (IBD) specialists representing 12 Canadian academic institutions spanning 7 provinces. Collectively, we have research expertise in epidemiology, clinical trials, health services research, economic analysis, and quality improvement. We are committed to a diverse array of initiatives to improve healthcare delivery in IBD.

About the Canadian Association of Gastroenterology

The Canadian Association of Gastroenterology (CAG) is a proud partner of the Choosing Wisely Canada campaign. The CAG represents more than 1,100 members across Canada, including physicians, basic scientists, and affiliated health care providers who work in the field of gastroenterology. The CAG is a member-focused organization with a mission to support and engage in the study of the organs of the digestive tract in health and disease, as well as to promote and advance gastroenterology by providing leadership in patient care, research, teaching and continuing professional development.

Five Things Physicians and Patients Should Question

1 Don't routinely obtain neuro-imaging studies (CT, MRI, or carotid dopplers) in the evaluation of simple syncope in patients with a normal neurological examination.

Although an uncommon cause for syncope, providers must consider a neurological cause in every patient presenting with transient loss of consciousness. In the absence of signs or symptoms concerning for neurological causes of syncope (such as but not limited to focal neurological deficits), the utility of neuro-imaging studies are of limited benefit. Despite a lack of evidence for the diagnostic utility of neuroimaging in patients presenting with true syncope, providers continue to perform brain computed tomographic (CT) scans. Thus, inappropriate use of this diagnostic imaging modality carries high costs and subject patients to the risks of radiation exposure.

2 Don't place, or leave in place, urinary catheters without an acceptable indication (such as critical illness, obstruction, palliative care).

Use of urinary catheters without an acceptable indication of use increases the likelihood of infection leading to greater morbidity and health care costs. Catheter-associated bacteriuria often leads to inappropriate antimicrobial use and secondary complications including emergence of antimicrobial-resistant organisms and infection with *Clostridium difficile*. A previous study showed that physicians are often unaware of urinary catheterization among their patients. Use of urinary catheters has found to be inappropriate in up to 50% of cases, with urinary incontinence listed as the most common reason for inappropriate and continued placement of urinary catheters. Clinical practice guidelines support the removal or avoidance of unnecessary urinary catheters in order to reduce the risk of catheter-associated urinary tract infections (CAUTIs).

3 Don't transfuse red blood cells for arbitrary hemoglobin or hematocrit thresholds in the absence of symptoms, active coronary disease, heart failure or stroke.

Indications for blood transfusion depend on clinical assessment and are also guided by the etiology of the anemia. No single laboratory measurement or physiologic parameter can predict the need for blood transfusion. Transfusions are associated with increased morbidity and mortality in high-risk hospitalized inpatients. Adverse events range from mild to severe, including allergic reactions, acute hemolytic reactions, anaphylaxis, transfusion related acute lung injury, transfusion associated circulatory overload, and sepsis. Studies of transfusion strategies among multiple patient populations suggest that a restrictive approach is associated with improved outcomes.

4 In the inpatient setting, don't order repeated CBC and chemistry testing in the face of clinical and lab stability.

Repetitive inpatient blood testing occurs frequently and is associated with adverse consequences for the hospitalized patient such as iatrogenic anemia, and pain. A Canadian study showed significant hemoglobin reductions as a result of phlebotomy. Given that anemia in hospital patients is associated with increased length of stay, readmission rates and transfusion requirements, reducing unnecessary testing may improve outcomes. Studies support the safe reduction of repetitive laboratory testing without negative effects on adverse events, readmission rates, critical care utilization or mortality. Laboratory reduction interventions have also reported significant cost savings.

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

Routine preoperative tests for low risk surgeries results in unnecessary delays, potential distress for patients and significant cost for the health care system. Numerous studies and guidelines outline lack of evidence for benefit in routine preoperative testing (e.g., chest X-ray, echocardiogram) in low risk surgical patients. Economic analyses suggest significant potential cost savings from implementation of guidelines.

How the list was created

The Canadian Society of Internal Medicine (CSIM) established its *Choosing Wisely Canada* Top 5 recommendations by convening a Committee of 20 members that represent a diverse group of general internists from across Canada, reflecting a broad range of geographical regions, practice settings, institution types and experience. The Committee chose to adopt pre-existing recommendations that have already undergone rigorous evidence review from the *Five Things Physicians and Patients Should Question* (© 2013 American College of Physicians; © 2012 Society of Hospital Medicine; © 2013 Society of General Internal Medicine), the American College of Physicians High Value Cost Conscious Care recommendations, and the “do not do” recommendations from the National Institute for Health and Care Excellence (NICE) in the United Kingdom. In addition, members brought forward recommendations based on experience and relevance to practice. Each Committee member was invited to anonymously rank all recommendations online. The Committee discussed the highest ranked recommendations and reached a consensus on a list of Top 5 items. The list of recommendations was presented at an open forum CSIM meeting and to the Executive Council at the 2013 CSIM Annual Meeting in Toronto, Canada. CSIM members who attended the Council meeting and the Choosing Wisely Update session were also given an opportunity to provide feedback. Minor refinements to the list were made and subsequently approved by the Committee. The CSIM Executive Council provides full endorsement and support for the final list of CSIM *Choosing Wisely Canada* recommendations.

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About Choosing Wisely Canada

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About The Canadian Society of Internal Medicine

The Canadian Society of Internal Medicine (CSIM) is a proud partner of the *Choosing Wisely Canada* campaign. The CSIM is a national medical society of physicians who are specialists in the broad discipline of general internal medicine. CSIM members provide expert medical care for adults with complex multi-system diseases at community and academic hospitals across Canada. CSIM members are teachers of medical students and residents and are leaders in health research and quality improvement. The CSIM has over 1,100 members and associates.

Six Things Physicians and Patients Should Question

1 Don't send the frail resident of a nursing home to the hospital, unless their urgent comfort and medical needs cannot be met in their care home.

Transfers to hospital for assessment and treatment of a change in condition have become customary. However, they are often of uncertain benefit, and may result in increased morbidity. In one Canadian study, 47% of hospitalizations were considered avoidable, while a recent US study found 39% to be 'potentially avoidable'. Transfer often results in long periods in an unfamiliar and stressful environment for the patient. Other hazards include delirium, hospital acquired infections, medication side effects, lack of sleep, and rapid loss of muscle strength while bedridden. Harms often outweigh benefits. Residents assessed and treated at their care home will receive more individualized care, better comfort and end of life care. If a transfer is unavoidable, give clear prior instructions to the hospital of the patient's needs. Respect for patient choice is a fundamental consideration in all decisions to transfer to a hospital. A clear understanding of the patient's goals must be established taking into account current health status, values and preferences. This will reduce the likelihood of inappropriate transfer. These goals should be discussed earlier and often with the patient and family, including whether comfort, function and quality of life are their most important goals.

2 Don't use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia.

People with dementia can sometimes be disruptive, behaving aggressively and resisting personal care. There is often a reason for the behaviour (pain, for example) and identifying and addressing the causes can make drug treatment unnecessary. When drug treatment is chosen, antipsychotic medicines are often prescribed, but they provide limited benefit and can cause serious harm, including premature death. These medications should be limited to cases where non-drug measures have already been tried and failed and the patients are a threat to themselves or others. When an antipsychotic has been prescribed, frequent review and attempts at reduction or discontinuation must be done to reduce harm.

3 Don't do a urine dip or urine culture unless there are clear signs and symptoms of a urinary tract infection (UTI).

Unless there are UTI symptoms such as urinary discomfort, abdominal/back pain, frequency, urgency or fever, testing should not be done. Testing often shows bacteria in the urine, with as many as 50% of those tested showing bacteria present in the absence of localizing symptoms to the genitourinary tract. Over-testing and treating asymptomatic bacteriuria with antibiotics leads to increased risk of diarrhea and infection with *Clostridium difficile*. Overuse of antibiotics contributes to increasing antibiotic-resistant organisms.

4 Don't insert a feeding tube in individuals with advanced dementia. Instead, assist the resident to eat.

Inserting a feeding tube does not prolong or improve quality of life in patients with advanced dementia. If the resident has been declining in health with recurrent and progressive illnesses, they may be nearing the end of their life and will not benefit from feeding tube placement. Feeding tubes are often placed because of fears that patients may aspirate food or become malnourished. Studies show that tube feeding does not make the patient more comfortable or reduce suffering. Tube feeding may cause fluid overload, diarrhea, abdominal pain and discomfort/injury (from the tube itself). A tube can actually increase the risk of aspiration and aspiration pneumonia. Helping people eat, rather than tube feeding, is a better way to feed patients who have advanced dementia and feeding difficulties.

5 Don't continue or add long-term medications unless there is an appropriate indication and a reasonable expectation of benefit in the individual patient.

Long-term medications should be discontinued if they are no longer needed (e.g., heartburn drugs, antihypertensives) as they can reduce the resident's quality of life while having little value for a frail elder with limited life expectancy (e.g., statins, osteoporosis drugs). Prescribing medications to meet lab test "targets" that apply to adults living in the community (e.g., blood sugar, blood pressure) may instead have dangerous effects on mobility, function, mortality and quality of life when applied to a frail elder in care.

6 Don't order screening or routine chronic disease testing just because a blood draw is being done.

Unless you are sure treatment can be given that would add to quality of life, don't do these tests. "Routine" testing may lead to harmful over-treatment in frail residents nearing the end of their life and lead to misusing healthcare resources that would do more good used wisely.

How the list was created

The Long Term Care Medical Directors Association of Canada (LTCMDAC) established its Top 6 recommendations under the leadership of their Director. LTCMDAC members were invited to participate in the list development by email. Two physician volunteers came forward to join the Director and form the Choosing Wisely Canada working group. To represent the patient voice, an articulate patient leader and Patients for Patient Safety Canada “champion” joined the working group. The American Medical Directors Association and Canadian Geriatric Society lists were reviewed as a starting point. None of these lists was specific to the frail elderly in residential care. The process aimed for recommendations that were valid and relevant for Canadian patients and our health care system. By small group discussion amongst the working group, the 6 recommendations were proposed. The document was then circulated to the members of the Board of the LTCMDAC for feedback and approval.

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About The Long Term Care Medical Directors Association of Canada

The Long Term Care Medical Directors Association of Canada (LTCMDAC) is a proud partner of the Choosing Wisely Canada campaign. LTCMDAC's vision is to increase physician leadership capacity in the nursing home to improve the quality of care and more importantly the quality of life for patients.

Five Things Residents and Patients Should Question

1 Don't order investigations that will not change your patient's management plan.

Investigations may not change your patient's management plan for several reasons. In some cases, the patient's pre-test probability for a condition is low, and further testing is not necessary (e.g., screening for breast cancer in younger women with low risk of breast cancer). Another example is unnecessary preoperative testing before a low-risk surgical procedure where the risk of complications is low. On the other hand, high-risk patients may warrant treatment irrespective of the test result; thus, testing in these patients would not influence the ultimate decision to treat (e.g., thrombophilia testing in patients with an unprovoked pulmonary embolism at high risk for recurrence is not helpful, since these patients should receive indefinite anticoagulation). Where possible, residents can refer to evidence-based clinical decision rules to guide appropriate testing or treatment – examples include the Well's criteria or pulmonary embolism rule-out criteria (PERC) for pulmonary embolism, the Canadian CT Head Rule for CT scan of the head in a trauma patient, or the Centor criteria for likelihood of bacterial infection in adult patients with a sore throat.

2 Don't order repeat laboratory investigations on inpatients who are clinically stable.

Daily laboratory investigations can persist despite clinical stability for a variety of reasons (e.g., daily order without a stop date, not reassessing whether investigations are still needed). Observational studies suggest that resident physicians order routine daily CBC (complete blood count) and electrolyte panels more frequently than attending physicians. Daily phlebotomy contributes to patient discomfort and iatrogenic anemia. Studies support the safe reduction of repetitive laboratory investigations when patients are clinically stable without a negative impact on patient outcomes, including readmission rates, critical care utilization, adverse events, or mortality. Laboratory investigations should be ordered with a specific purpose which directly links to a specific management plan for patients.

3 Don't order intravenous (IV) when an oral (PO) option is appropriate and tolerated.

Patients are often ordered intravenous (IV) medications when oral (PO) options are available, appropriate, and equally bioavailable. Common examples include antibiotics that are highly orally bioavailable (e.g., fluoroquinolones), oral potassium replacement (which is more effective than IV replacement), proton pump inhibitors (PPI) including in the setting of many cases of acute gastrointestinal bleeding, and oral vitamin B12 replacement (as opposed to intramuscular injections, including in the context of pernicious anemia). Peripheral catheters increase the risk of complications, including extravasation, infections, and thrombophlebitis. Furthermore, IV medication administration is often significantly costlier, decreases patient mobility, and increases length of hospital stay and pharmacist and nursing workload.

4 Don't order non-urgent investigations or procedures that will delay discharge of hospital inpatients.

Discharges are commonly delayed for investigations that will not change acute management. Examples include biopsies, imaging to further investigate incidental findings, assessment by a specialist that is non-urgent, waiting for bloodwork results as part of a non-urgent diagnostic work-up, or echocardiography for patients with mild heart failure. Delayed discharges contribute to hospital over-crowding and negatively impact care efficiency. Crucially, longer lengths of stay is a risk factor for nosocomial infections, venous thromboembolism, pressure injuries, immobility, malnutrition, and deconditioning. Consider outpatient investigations when possible, if good follow-up can be assured.

5 Don't order invasive studies if less invasive options are available and as effective.

When considering diagnosis or screening investigations, consider all available tests. It is prudent to consider the least invasive option that will have similar sensitivity and specificity to guide clinical decision making to minimize the potential for harm to the patient. For example, when diagnosing acute appendicitis in children, ultrasound should be considered before computed tomography (CT) scanning. Not only is ultrasound radiation- and contrast-free, but it has been shown to be equivalent to CT scanning in the diagnosis and management of acute appendicitis across several clinically-relevant endpoints, including time to antibiotic delivery, time to appendectomy, negative appendectomy rate, perforation rate, or length of stay. Another example is conducting a non-invasive urea breath test rather than invasive endoscopy to prove *H. pylori* eradication. The sensitivity and specificity of the urea breath test are superior compared to other diagnostic tests and the risk of patient harm is minimal compared to endoscopy.

How the list was created

Resident Doctors of Canada (RDoC) established its Choosing Wisely Canada Top 5 recommendations by forming a resident taskforce comprised of 5 residents representing geographic and specialty diversity. The taskforce established six principles of development: 1) arise frequently in residency training, 2) have relevance to residents, 3) play a role in shaping future behaviours, 4) be one that residents may feasibly address during their training, 5) focus on residents' use of tests, treatments, or procedures, and 6) contribute to building a more economically sustainable, cost-conscious healthcare system. The task force generated a list of 20 candidate recommendations along with supporting evidence that were reviewed by the RDoC Practice Committee, and then narrowed the list to 12 recommendations to move forward for national consultation. The candidate recommendations were distributed to residents across Canada through an online questionnaire. Residents were asked to rank the recommendations keeping in mind the above principles for development. Over 750 residents from all provincial housestaff organizations provided feedback and weighted aggregate scores for each recommendation were calculated. The taskforce discussed the results and used the information to inform the final list of five recommendations. The RDoC Board approved and officially endorses the list of resident recommendations.

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About Resident Doctors of Canada

Resident Doctors of Canada (RDoC) is a proud partner of the Choosing Wisely Canada campaign. RDoc represents over 9,000 resident doctors across Canada. Established in 1972, it is a not-for-profit organization providing a unified, national voice for our members. RDoC collaborates with other national health organizations to foster excellence in training, wellness, and patient care.

Six Things Medical Students and Trainees Should Question

1 Don't suggest ordering the most invasive test or treatment before considering other less invasive options.

There are often diagnostic approaches and treatment options that result in the same clinical outcome but are less invasive. Examples include the use of ultrasound instead of computed tomography (CT) scanning to diagnose acute appendicitis in children, or the use of an oral antibiotic that has similar oral bioavailability as its intravenous counterpart. Taking time to consider the diagnostic sensitivity and specificity of less invasive tests or the therapeutic effectiveness of less invasive treatments can minimize unnecessary patient exposure to harmful side effects of more invasive tests or treatments.

2 Don't suggest a test, treatment, or procedure that will not change the patient's clinical course.

When ordering tests, it is important to always consider the diagnostic characteristics such as sensitivity, specificity and predictive value in light of the patient's pre-test probability. Patients who are at very low baseline risk often do not require an additional test to rule out the diagnosis. Furthermore, evidence suggests that in such low-risk patients, diagnostic tests do not reassure patients, decrease their anxiety, or resolve their symptoms. Examples include the use of computed tomography (CT) scanning in low-risk patients to rule out pulmonary embolism, or pre-operative cardiac testing for patients prior to low risk surgery. Evaluation of baseline risk and the use of decision tools wherever possible, along with a 'how will this change my management' approach, can help to avoid unnecessary 'rule out' testing in patients.

3 Don't miss the opportunity to initiate conversations with patients about whether a test, treatment or procedure is necessary.

Patient requests sometimes drive overuse. For example, a parent might request antibiotics for his or her child who likely has viral sinusitis, or a patient might request magnetic resonance imaging (MRI) for low-back pain. Often patients are unaware of the benefits, side-effects and risks of tests and treatments. Taking time to explore a patient's concerns, and counseling them about the relative benefits and risks of tests or treatments represents a patient-centered approach to ensuring the appropriate use of resources.

4 Don't hesitate to ask for clarification on tests, treatments, or procedures that you believe are unnecessary.

Unfortunately, in some learning environments, a hierarchy exists between supervisors and students that makes it difficult for students to feel comfortable speaking up. As a result, students might observe unnecessary care, but avoid saying anything for fear of potential consequences. Supervisors need to encourage students to feel free to question whether tests or treatments are truly necessary without fear of repercussion. The clinical training environment should be one where students feel safe to ask questions.

5 Don't suggest ordering tests or performing procedures for the sole purpose of gaining personal clinical experience.

The clinical training years in medical school represent an important opportunity for students to translate what was learned in the classroom to the bedside. This can be a challenging time of great uncertainty for students. Students may order tests excessively due to a lack of clinical experience, or recommend investigations in order to build upon their personal experience.

6 Don't suggest ordering tests or treatments pre-emptively for the sole purpose of anticipating what your supervisor would want.

A "hidden curriculum" pervasive in the academic environment encourages medical students to search for zebras through extensive (and often unnecessary) diagnostic workups. Because restraint is often discouraged, students adopt the belief that faculty expect an exhaustive diagnostic approach, and feel that they need to demonstrate their knowledge, thoroughness and curiosity through test ordering. Students can overcome this practice by articulating why they chose not to order a specific test. This, combined with a shift towards 'celebrating restraint' by faculty can help to combat this pervasive practice in medical training.

How the list was created

The list of “Six Things Medical Students and Trainees Should Question” was developed in partnership with the Canadian Federation of Medical Students (CFMS), and the Fédération médicale étudiante du Québec (FMEQ), which together represent all medical students in Canada. A student-led taskforce, including 3 medical students and 3 Choosing Wisely Canada leads, convened to develop recommendations that target behaviors medical students should question during their training. The task force generated a list of 10 candidate recommendations with input from a key informant group that included student, resident, and faculty representatives. The candidate recommendations were distributed to medical students across Canada through an online questionnaire. Students were asked to rate recommendations while keeping the following criteria in mind: the issue should (i) arise frequently in medical school training, (ii) have relevance to medical students, (iii) play a role in shaping future behaviors, and (iv) be one that medical students could feasibly address during their training. Nearly 2,000 students from all 17 Canadian medical schools provided feedback, which the taskforce used to inform the final list of six recommendations. Both the CFMS and the FMEQ executives approved and officially endorse the list of medical student recommendations.

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About Choosing Wisely Canada: *Choosing Wisely Canada* is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care. For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Federation of Medical Students: The Canadian Federation of Medical Students (CFMS) is a proud partner of the *Choosing Wisely Canada* campaign. The CFMS is the organization representing over 8,000 medical students from 14 Canadian medical student societies from coast to coast. The CFMS represents medical students to the public, to the federal government, and to national and international medical organizations.

About The Fédération médicale étudiante du Québec: The Fédération médicale étudiante du Québec (FMEQ) is a proud partner of the *Choosing Wisely Canada* campaign. The FMEQ is the body that represents the voice of the four Quebec medical associations and promotes their interests, serving more than 3900 medical students in Quebec.

Five Things Physicians and Patients Should Question

1 **Don't use non-invasive prenatal detection of fetal aneuploidies by cell-free DNA as a diagnostic test.**

Non-invasive prenatal detection of fetal aneuploidies by cell-free DNA, also called non-invasive prenatal testing (NIPT) and non-invasive prenatal screening (NIPS), is a method of non-invasive fetal DNA testing done through a maternal blood sample. NIPT testing for common aneuploidies, microdeletions and sex chromosome disorders is clinically available to patients in Canada. NIPT is a highly sensitive and specific screening test, but is not diagnostic. Even in high-risk populations, there can be false positive NIPT results. Genetic counselling, along with confirmatory testing via amniocentesis or chorionic villus sampling, should be done prior to using the result to impact management of a pregnancy.

2 **Don't make medical decisions based on results of direct to consumer genetic testing (DTC-GT) without a clear understanding of the limitations and validity of the test.**

Three types of potentially medically-relevant DTC-GT are available: (1) assessment of risk for common multifactorial diseases (e.g., diabetes, etc.); (2) targeted mutation analysis for single gene disorders; and, (3) sequencing. Some DTC-GT companies state that they do not guarantee the accuracy or reliability of their tests. Many of the significant genetic risk and protective factors for multifactorial conditions have not been identified. This leads to greatly divergent risk interpretations between companies, even when performed on the same individual. For targeted mutation analysis and sequencing, the specific test may not include all clinically relevant genes or mutations; resulting in false reassurance. Genetic changes that are only weakly associated with disease may be reported, leading to anxiety or inappropriate additional testing. When making medical decisions based on results of genetic testing, the test should meet the recommendations made by the Canadian College of Medical Geneticists in 2012. Not all DTC-GT meet these recommendations.

3 **Don't order a chromosome analysis by doing a karyotype for individuals with intellectual disability/developmental delay of unknown etiology.**

Microarray is the first line test for individuals with intellectual disability/developmental delay without a recognizable syndrome. Indeed, a microarray has a much higher detection rate (15 - 20%) compared to a karyotype (3 - 4%) in individuals presenting for this clinical indication. A karyotype remains important in limited clinical situations where a specific numerical or structural chromosomal syndrome, such as Down syndrome, is suspected.

4 **Don't order whole exome sequencing prior to genetic counselling.**

Whole exome sequencing (WES) is a powerful test for individuals suspected of having an underlying genetic diagnosis. However, WES increases the likelihood of unexpected findings, which may or may not be clinically significant. Further, due to methodological limitations, WES may not always be the correct test to order as WES will not detect all genetic causes of disease (for example, it will not detect chromosomal structural differences). Both informative and uninformative results can lead to complex patient and family psychosocial repercussions, and could impair future insurability. Genetic counselling facilitates informed decision-making. Given complexity of results, WES should only be ordered after counselling by a qualified health care provider.

5 **Don't order carrier testing in children.**

Carrier testing is primarily useful in the reproductive period to determine the risk of an individual having a child affected by the condition for which testing is being considered. Knowing that a child is a carrier of an X-linked or autosomal recessive condition usually does not alter medical care in the pediatric years since most carriers are unaffected. Thus, in most situations, there is not a medical indication for carrier testing in a child. Undertaking carrier testing of a child violates the right of the child to make his or her own decision about testing and could potentially impair future insurability. An exception could be made for a mature adolescent who may be able to understand the reproductive implications of carrier testing after appropriate genetic counselling.

How the list was created

The medical genetics Choosing Wisely Canada recommendations were generated by the Ethics, Education and Public Policy (E2P2) committee of the Canadian College of Medical Geneticists (CCMG) in consultation with the entire membership of the CCMG. In the summer of 2015, the E2P2 committee generated a first list of potential statements and a pilot survey was distributed during the CCMG annual conference in September 2015. Based on the feedback received, the E2P2 committee modified the statements and generated new ones. An electronic survey (via Survey Monkey) was distributed to the entire CCMG membership in March 2016; members were asked to rank their 5 favourite statements. The answers were weighted and the 5 top statements were selected. Members of the E2P2 committee reviewed the literature and generated a rationale for each of the 5 statements. The 5 statements and their rationale were orally presented during the general assembly of the CCMG annual meeting in June 2016. Comments received at that time led to a slight revision of the wording of the rationale of some statements by the members of the E2P2 committee. The statements and their rationale were then posted online for comments in the members-only section of the CCMG website for one month during the summer of 2016. Members of the CCMG all received an email prompting them to review these statements. The E2P2 committee reviewed all comments received and slightly altered the wording of some statements. The list was then circulated to all medical professional society leads engaged in Choosing Wisely Canada for review. Comments received were considered by the E2P2 committee and the list was finalized.

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About The Canadian College of Medical Geneticists

The Canadian College of Medical Geneticists (CCMG) is a proud partner of the Choosing Wisely Canada campaign. Medical genetics is the branch of medicine concerned with the effect of genetic variation on human development and health and also with the study, diagnosis, management, and prevention of genetic and related disorders in individuals, families, and communities. The Canadian College of Medical Geneticists is the national specialty society that represents genetic specialists (MDs and PhDs) who see patients with genetic conditions and/or direct laboratories that perform diagnostic testing for genetic conditions.

Five Things Physicians and Patients Should Question

1 **Don't collect urine specimens for culture from adults who lack symptoms localizing to the urinary tract or fever unless they are pregnant or undergoing genitourinary instrumentation where mucosal bleeding is expected.**

Urine cultures are the most frequently ordered microbiologic test, with the majority of specimens submitted from asymptomatic patients. Urine cultures should only be ordered if patients have symptoms localizing to the urinary tract such as acute dysuria, urgency, frequency, suprapubic or flank pain or fever without an obvious alternate source. Outside of these specific symptoms, positive cultures indicate asymptomatic bacteriuria and frequently result in antimicrobial therapy that is of no benefit and is potentially harmful. Cloudy or malodorous urine are not specific findings of urinary tract infection and should not prompt culture unless acute urinary tract symptoms are present. Delirium is not considered a symptom of cystitis in non-catheterized patients. In catheterized patients with fever or delirium, a positive urine culture may still represent asymptomatic bacteriuria unless alternate sources have been excluded. Laboratories should consider supplementing educational efforts to reduce collection of urine cultures from asymptomatic patients with analytical interventions that reduce processing of low-value specimens.

2 **Don't routinely collect or process specimens for *Clostridium difficile* testing when stool is non-liquid (i.e., does not take the shape of the specimen container) or when the patient has had a prior nucleic acid amplification test result within the past 7 days.**

Only liquid stool specimens should be collected or processed for *C. difficile* detection, as a positive test in the absence of diarrhea likely represents *C. difficile* colonization. Diagnostic gains are minimal with repeat *C. difficile* nucleic acid amplification testing within 7 days of a negative test. Repeat *C. difficile* toxin testing by enzyme immunoassay within 7 days of a prior negative test is also of little incremental diagnostic yield but may be warranted in select cases. Test of cure in patients with recent *C. difficile* infection is also not recommended. Prior investigations have shown that the use of hospital information systems to restrict ordering of repeat tests for these reasons resulted in a 91% reduction in repeat testing.

3 **Don't obtain swabs from superficial ulcers for culture as they are prone to both false positive and false negative results with respect to the cause of the infection.**

All wounds are colonized with microorganisms. Cultures should not be obtained from wounds that are not clinically infected (i.e., absence of classical signs of inflammation or purulence or increasing pain). For wounds that are clinically infected, the ideal specimens for culture are deep specimens that are obtained through biopsy or deep curettage following cleansing/debridement of the wound. Laboratories should consider use of screening criteria to reject such swabs without proceeding to culture. For superficial swab specimens that are processed/cultured, interpretation of the results should be correlated with the Gram stain.

4 **Don't routinely order nucleic acid amplification testing on cerebrospinal fluid (e.g., herpes simplex virus, varicella zoster virus, enteroviruses) in patients without a compatible clinical syndrome.**

Although nucleic acid amplification testing is the modality of choice for determining the viral etiology of meningitis/encephalitis, it should not be requested routinely on all cerebrospinal fluid specimens. The routine use of these tests in patients without compatible clinical syndromes can result in unnecessary empiric antiviral treatment, additional care, and prolonged length of hospitalization for patients awaiting testing results. Additionally, routine testing may result in depletion of cerebrospinal fluid needed for other diagnostic purposes. In cases where nucleic acid testing is requested for adults, laboratories should have policies for when testing will be performed if the cerebrospinal fluid cell count and protein are normal.

5 **Don't routinely obtain swabs during surgical procedures when fluid and/or tissue samples can be collected.**

Fluids and tissue specimens can usually be obtained in the controlled setting of the operating room and represent higher quality specimens than swabs. Culture of swab specimens is associated with increased false negative results, as they are inferior in recovering anaerobic bacteria, mycobacteria and fungi, and provide inadequate volumes to perform all necessary diagnostic tests. To encourage collection of fluid and/or tissue samples, consideration should be given to making swabs unavailable in the operating room without specific request.

How the list was created

A Choosing Wisely Canada top five list in medical microbiology was developed by the Association of Medical Microbiology and Infectious Diseases Canada (AMMI Canada) through broad consultation of its members. Following an electronic survey requesting members to identify low-value practices within microbiology, AMMI Canada convened a Working Group which developed a list of draft recommendations that were discussed and ranked during a national open forum using the modified Delphi method. The top five list was revised based on feedback received from AMMI Canada members through an online forum. The AMMI Canada Executive Council and Guidelines Committee endorsed the final list, which was disseminated online.

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About The Association of Medical Microbiology and Infectious Disease Canada

The Association of Medical Microbiology and Infectious Disease Canada (AMMI) is a proud partner of the Choosing Wisely Canada campaign. AMMI Canada is the national association that represents physicians, clinical microbiologists and researchers specializing in the fields of medical microbiology and infectious diseases. Through promotion of the diagnosis, prevention and treatment of human infectious diseases and by our involvement in education, research, clinical practice and advocacy, AMMI Canada aims to serve and educate the public and also to enhance the career opportunities of its members through professional development and advocacy initiatives.

Five Things Physicians and Patients Should Question

1 Don't initiate erythropoiesis-stimulating agents (ESAs) in chronic kidney disease (CKD) patients with hemoglobin levels greater than or equal to 100 g/L without symptoms of anemia.

Administering ESAs to CKD patients with the goal of normalizing hemoglobin levels has not demonstrated survival or cardiovascular disease benefit, and may be harmful in comparison to a treatment regimen that delays ESA administration or sets relatively conservative targets (90–110 g/L).

2 Don't prescribe nonsteroidal anti-inflammatory drugs (NSAIDs) in individuals with hypertension or heart failure or CKD of all causes, including diabetes.

The use of NSAIDs, including cyclo-oxygenase type 2 (COX-2) inhibitors, for the pharmacological treatment of musculoskeletal pain can elevate blood pressure, make antihypertensive drugs less effective, cause fluid retention and worsen kidney function in these individuals. Other medication prescribed by a healthcare professional may be safer than and as effective as NSAIDs.

3 Don't prescribe angiotensin converting enzyme (ACE) inhibitors in combination with angiotensin II receptor blockers (ARBs) for the treatment of hypertension, diabetic nephropathy and heart failure.

When used in combination ACE inhibitors and ARBs are associated with an increased risk of symptomatic hypotension, acute renal failure and hyperkalemia and may increase mortality.

4 Don't initiate chronic dialysis without ensuring a shared decision-making process between patients, their families, and their nephrology health care team.

The decision to initiate chronic dialysis should be part of an individualized, shared decision-making process between patients, their families, and their nephrology health care team. This process includes eliciting individual patient goals and preferences and providing information on prognosis and expected benefits and harms of dialysis within the context of these goals and preferences. Limited observational data suggest that survival may not differ substantially for older adults with a high burden of comorbidity who initiate chronic dialysis versus those managed conservatively.

5 Don't initiate dialysis in outpatients with Stage 5 CKD in the absence of clinical indications.

Initiating chronic dialysis before the appearance of uremic symptoms or other clinical indication is associated with significant burden and inconvenience for the patient without any clinical benefit. Recent guidelines from the Canadian Society of Nephrology recommend that patients with an estimated glomerular filtration rate (eGFR) less than 15 mL/min should be closely followed by their nephrologist and dialysis deferred until symptoms of uremia, volume overload, hyperkalemia or acidosis become an issue or the eGFR drops below 6 mL/min.

How the list was created

The Canadian Society of Nephrology (CSN) established its *Choosing Wisely Canada* recommendations by striking a Choosing Wisely Working Group from its Clinical Practice Guidelines Committee. The working group created a survey to poll the members of the society, who were asked to vote for 5 tests, 5 investigations and 5 treatments that they felt were overused, misused or had potential to cause harm. Over 400 members were surveyed with a 22% response rate. These responses were collated into themes, and ordered by their frequency of occurrence. Three members of the working group reviewed the list independently; each of whom proposed a top 10 list of recommendations derived from the survey responses. These 3 lists were then reviewed by the working group and a draft top ten list was generated based on the following criteria: strength of evidence; potential for harm; cost saving; frequency of occurrence in clinical practice and pertinence to nephrology. The draft list of ten items was presented at the CSN annual general meeting and members were asked to vote electronically on their agreement with each recommendation. In addition to the membership votes, the working group then considered the strength of evidence and potential for meaningful impact of the recommendations, and a final list of five items was agreed upon. Recommendations 1, 2, and 4 were adapted with permission from the Five Things Physicians and Patients Should Question. © 2012 American Society of Nephrology.

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About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care.

For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Society of Nephrology

The Canadian Society of Nephrology (CSN) is a proud partner of the *Choosing Wisely Canada* campaign. CSN is a society of physicians and scientists specializing in the care of people with kidney disease, and in research related to the kidney and kidney disease. The mission of CSN is focused on setting high standards for medical training and education; encouraging research related to the kidney, kidney disorders and renal replacement therapies; improving the delivery of health care related to nephrology; and, promoting the continuing professional competence of nephrologists.

Five Things Physicians and Patients Should Question

1 Don't perform stress cardiac imaging or coronary angiography in patients without cardiac symptoms unless high-risk markers are present.

Asymptomatic, low-risk patients account for up to 45% of inappropriate stress testing. Testing in these asymptomatic patients should be performed only when the following findings are present: diabetes in patients older than 40 years of age, peripheral arterial disease, and greater than 2% yearly coronary heart disease event rate.

2 Don't use nuclear medicine thyroid scans to evaluate thyroid nodules in patients with normal thyroid gland function.

Nuclear medicine thyroid scanning does not conclusively determine whether thyroid nodules are benign or malignant; cold nodules on thyroid scans will still require biopsy. Nuclear medicine thyroid scans are useful to evaluate the functional status of thyroid nodules in patients who are hyperthyroid.

3 Don't use a computed tomography angiogram (CTA) to diagnose pulmonary embolism in young patients, particularly women, with a normal chest radiograph; consider a radionuclide lung study ('V/Q study') instead.

When the clinical question is whether or not pulmonary emboli are present, a V/Q study can provide the answer with lower overall radiation dose than can CTA. The dose to the breast in women from a nuclear medicine lung scan is much less than the dose from CT performed with a breast shield. Imaging may not be required in patients with a low clinical likelihood of pulmonary emboli and a negative high-sensitivity D-Dimer.

4 Don't do routine bone scans in men with low-risk prostate cancer.

Patients who are at low risk of metastatic disease, defined by criteria based on prostate-specific antigen (PSA) and Gleason score, do not need a bone scan for staging. Bone scans may be useful if there are findings in the patient's history or physical examination, which raise the suspicion of bony involvement.

5 Don't repeat DEXA scans more often than every two years in the absence of high risk or new risk factors.

Various factors limit the utility of repeat DEXA scans more often than every two years, particularly in stable patients. These include the expected rate of bone loss, which is unlikely to be detected at smaller intervals, and measurement error, which may make repeat measures unreliable. This may be compounded if different DEXA machines are used. In stable patients, the interval between scans may be prolonged, or a repeat may not be necessary.

How the list was created

The Canadian Association of Nuclear Medicine (CANM) established its *Choosing Wisely Canada* Top 5 recommendations by first having its newly created Choosing Wisely Campaign Working Group review the Society of Nuclear Medicine and Molecular Imaging (SNMMI) and the American Society of Nuclear Cardiology (ASNC) Choosing Wisely® lists. As the American lists reflected the same issues encountered in Canada, the CANM Working Group approved the lists in principle, selected the most appropriate procedures to be questioned and added two recommendations of its own. The list created was then circulated to the CANM Board of Directors and to the general membership for feedback. Item 1 was adopted with permission from the Five Things Physicians and Patients Should Question, ©2012 American Society of Nuclear Cardiology. Items 2 and 4 were adopted with permission from the Five Things Physicians and Patients Should Question, ©2013 Society of Nuclear Medicine and Molecular Imaging.

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About Choosing Wisely Canada

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About The Canadian Association of Nuclear Medicine

The Canadian Association of Nuclear Medicine (CANM) is a proud partner of the *Choosing Wisely Canada* campaign. The CANM strives for excellence in the practice of diagnostic and therapeutic nuclear medicine by promoting the continued professional competence of nuclear medicine specialists, establishing guidelines of clinical practice, and encouraging biomedical research. We work with all professionals in nuclear medicine to ensure that Canadians have access to the highest quality nuclear medicine services.

Nurse Practitioner

Nine Things Nurse Practitioners and Patients Should Question

by

Nurse Practitioner Association of Canada

Last updated: September 2017



1 **Don't prescribe any medication to patients over the age of 65 without conducting a thorough medication review.**

Patients over the age of 65 have an increased risk of drug interactions, adverse drug reactions and falls. Although it can sometimes be appropriate to prescribe new medications, a thorough medication review should be done concurrently. The review should ensure that the medications are having the desired effect, that the lowest effective doses are being used, that the patient has been involved in the decision to use them and that they align with the patient's goals of care. There is a paucity of research on clinical outcomes associated with medication review tools however, the STOPP/START, Beers criteria and the McLeod criteria have been reviewed in a Cochrane analysis. Another useful resource is www.Medstopper.com.

2 **Don't prescribe vitamin B12 injections to clients with low vitamin B12 levels as first line therapy.**

Vitamin B12 deficiency affects approximately 5% of Canadian adults. Deficiencies are primarily the result of a lack of intrinsic factor (pernicious anemia). Vitamin B12 absorption can also be affected by the regular use of proton pump inhibitors. There is a large body of evidence supporting the efficacy of oral B12 administration in most cases related to pernicious anemia, malabsorption or malnutrition. The use of oral vitamin B12 is cost effective. Furthermore, using the oral formulation will decrease the need for unnecessary clinic visits for vitamin B12 injection, improve efficiency and decrease costs without compromising patient care. After the initiation of therapy, serum vitamin B12 concentrations should be monitored to assess for efficacy. Given the lack of conclusive evidence, vitamin B12 injections should still be considered for patients with severe neurological involvement, ileectomy and significant malabsorption syndromes.

3 **Don't routinely measure Vitamin D levels in low risk adults.**

Clinical evidence shows that screening for vitamin D deficiency in healthy individuals is generally not necessary. Vitamin D deficiency is common in many populations, particularly in patients at higher latitudes, during winter months and in those with limited sun exposure. Therefore, Canadians have inadequate exposure to sunlight, which puts them at risk for vitamin D deficiency. Over the counter vitamin D supplements and increased summer sun exposure are sufficient interventions for most otherwise healthy patients. Laboratory testing is appropriate in higher risk patients when results will be used to institute more aggressive therapy (e.g., osteoporosis, chronic kidney disease, malabsorption, some infections, obese individuals).

4 **Don't do annual complete physical examinations on asymptomatic adults with no significant risk factors.**

Instead, nurse practitioners should counsel their well, asymptomatic patients regarding the importance of screening and focused health assessments performed according to their risk factors. These visits may include specific physical examination maneuvers and screening tests that should occur at intervals informed by the available evidence such as the Canadian Task Force on Preventive Health Care and provincial cancer care organizations. Following evidence based recommendations, including relevant physical examination and screening test guidelines (pap smears, colorectal cancer screening, etc.) has been shown to be effective at helping nurse practitioners and their patients to find disease before symptoms arise.

5 **Don't order screening chest X-rays in asymptomatic patients.**

This includes periodic health exams, pre-employment health assessments, tuberculosis screening, preoperative and pre-admission screening and cancer screening. There is little evidence to indicate that patient outcomes are improved with screening in these populations. Furthermore, exposure to unnecessary radiation may exceed any potential benefits. Chest X-rays on asymptomatic patients may also result in false positive reporting, which may cause undue stress. The decision to order a chest X-ray should be considered on careful evaluation of any patient presentation indicative of respiratory disease or illness.

6 Don't order chest X-rays in patients with acute upper respiratory tract infections.

There is no evidence that a chest X-ray improves patient outcomes or decreases recovery time for those with upper respiratory infections. Chest X-rays should be reserved for those patients with clinical suspicion of pneumonia, acute upper airway infection with comorbid conditions and those with symptoms persisting beyond three weeks. Pneumonia presents with at least two of: fever, rigors, new cough with or without sputum production or chronic cough with change in colour of sputum, pleuritic chest pain, shortness of breath and localized crackles. Nurse practitioners should be mindful of the risks associated with cumulative radiation exposure such as that from chest X-rays.

7 Don't order thyroid function tests as screening for asymptomatic, low risk patients.

The primary rationale for screening asymptomatic patients is that the resulting treatment leads to improved health outcomes when compared with patients who are not screened. There is insufficient evidence available indicating that screening for thyroid diseases will have these results.

8 Don't prescribe prophylactic antibiotics to prevent travellers' diarrhea.

Travellers' diarrhea is the most predictable travel related illness affecting up to 70% of travellers to developing countries. The vast majority of cases clear on their own in a few days without treatment. Antibiotic prophylaxis for travellers' diarrhea is not recommended as these treatments disrupt the normal gut flora and allow resistant bacteria such as extended-spectrum beta lactamase (ESBL) producing bacteria to flourish. Those taking antibiotics are more likely to become colonized with ESBL producing bacteria. These individuals can shed the bacteria upon return home for several months and close contacts and family members may become colonized with the organism. As a safer alternative, travellers should consider prophylaxis with bismuth salicylate given the good evidence for its use. Clinicians may consider prescribing a three-day supply of antibiotics to carry with patients with clear instructions to only take them for severe diarrhea, given the benefit of reduced symptom duration.

9 Don't screen women with Pap smears if under 21 years of age or over 69 years of age.

Screening pap tests should not be done on asymptomatic patients outside of screening intervals and age groups specified in relevant provincial and national guidelines. Cervical cancer is very rare in women younger than 21 years of age even if they are sexually active. Abnormal cells in young women usually go back to normal with no treatment. Cervical cancer is very rare in women over 65 years of age who have had normal pap smears at regular recommended screening intervals. Screening pap smears done outside of recommended populations could result in false positive findings and lead to unnecessary follow up and treatment. This could result in stress for the patient and expose them to the risks associated with additional investigations and treatments. Monitor for cervical screening guideline changes based on the most up to date evidence.

How the list was created

The Nurse Practitioner Association of Canada's (NPAC) Executive Board approved the development of Choosing Wisely Canada's NP recommendations. NPAC created a small working group to review existing Choosing Wisely Canada recommendations and develop potential ideas for an NP list. The working group created a list of suggested recommendations based on existing research, experience and common practice patterns. The Choosing Wisely Canada NP list was posted on the NPAC website discussion board for review and comments by NPAC members. The nine recommendations selected to be part of the Choosing Wisely Canada NP campaign were presented to the NPAC executive board for review and final approval prior to being submitted to Choosing Wisely Canada.

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About the Nurse Practitioner Association of Canada

NPAC-AIIPC is the national voice for Nurse Practitioners, with the goal of advocating for, and reducing barriers to NP practice. This Canadian organization consists of over 1300 members, encompassing a number of nurse practitioner specialties.



Nurse Practitioner
Association of Canada

About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care.

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Nine Things Nurses and Patients Should Question

1 Don't insert an indwelling urinary catheter or leave it in place without daily assessment.

The use of indwelling urinary catheters among hospital patients is common. Yet it can also lead to preventable harms such as urinary tract infection, sepsis and delirium. Guidelines support routine assessment of appropriate urinary catheter indications—including acute urinary obstruction, critical illness and end-of-life care—and minimizing their duration of use. Strategies consistent with CAUTI (catheter-associated urinary tract infection) guidelines regarding inappropriate urinary catheter use have been shown to reduce health care-associated infections.

2 Don't advise routine self-monitoring of blood glucose between appointments for clients with type 2 diabetes who are not taking insulin or other medications that could increase risk for hypoglycemia.

Many studies show that, once target control is achieved, routine self-monitoring of blood glucose (SMBG) does little to control blood sugar for most adults with type 2 diabetes who don't use insulin or other medications that could increase risk for hypoglycemia. It should be noted that SMBG may be indicated during acute illness, medication change or pregnancy; when a history or risk of hypoglycemia exists (e.g., if using a sulfonylurea), and when individuals need monitoring to maintain targets—considerations that should be part of assessment and client education.

3 Don't add extra layers of bedding (sheets, pads) beneath patients on therapeutic surfaces.

Additional layers of bedding can limit the pressure-dispersing capacities of therapeutic surfaces (such as therapeutic mattresses or cushions). As a result, extra sheets and pads can contribute to skin breakdown and impede the healing of existing pressure wounds.

4 Don't use oxygen therapy to treat non-hypoxic dyspnea.

Oxygen is frequently used to relieve shortness of breath. However, supplemental oxygen does not benefit patients who are short of breath but not hypoxic. Supplemental flow of air is as effective as oxygen for non-hypoxic dyspnea.

5 Don't routinely use incontinence containment products (including briefs or pads) for older adults.

Adult incontinence containment products are frequently used for continent patients (especially women) with low mobility. Yet the literature associates their use with multiple adverse outcomes including diminished self-esteem and perceived quality of life, and higher incidence rates of dermatitis, pressure wounds and urinary tract infections. Among older adults, nurses should conduct a thorough assessment to determine the risk of such outcomes before initiating or continuing the use of incontinence containment products. The development of a continence care plan should be a shared decision-making process that includes the known wishes of clients regarding care needs and the perspectives of carers and the health care team.

6 Don't recommend tube feeding for clients with advanced dementia without ensuring a shared decision-making process that includes the known wishes of clients regarding future care needs and the perspectives of carers and the health care team.

Tube feeding for older adults with advanced dementia offers no benefit over careful feeding assistance related to the outcomes of aspiration pneumonia and the extension of life. While food is the preferred form of obtaining nutrition, oral supplements may be beneficial if this intervention meets the person's known goals of care. Tube feeding may contribute to client discomfort and result in agitation, the use of physical and/or chemical restraint and worsening pressure wounds.

7 Don't recommend antipsychotic medicines as the first choice to treat symptoms of dementia.

People with dementia frequently exhibit responsive behaviors, which are often misinterpreted as aggression, resistance to care and challenging or disruptive behaviours. In such instances antipsychotic medicines are regularly prescribed. The benefit of these drugs is limited, however, and they can also cause serious harm including premature death. Their use should be limited to cases where non-pharmacologic measures have failed and where patients pose an imminent threat to themselves or others. Identifying and addressing the causes of behaviour change can render drug treatment unnecessary. If a nurse caring for a patient feels that medication is not the appropriate intervention, the nurse has a responsibility to discuss these concerns with the prescriber.

8 Don't recommend antimicrobials to treat bacteriuria in older adults unless specific urinary tract symptoms are present.

Signs and symptoms suggestive of urinary tract infection (UTI) are increased frequency, urgency, pain or burning on urination, supra-pubic pain, flank pain and fever. Dark, cloudy and/or foul-smelling urine may not be suggestive of UTI but rather of inadequate fluid intake. Cohort studies have found no adverse outcomes associated with asymptomatic bacteriuria for older adults. Not only does antimicrobial treatment for such bacteriuria in older adults show no benefits, it increases adverse antimicrobial effects. Consensus criteria have been developed for the specific clinical symptoms that (when associated with bacteriuria) define UTI. Exceptions to these criteria include recommended screening for and treatment of asymptomatic bacteriuria before urologic procedures where mucosal bleeding is anticipated. If a nurse caring for a patient feels that medication is not the appropriate intervention, the nurse has a responsibility to discuss these concerns with the prescribers.

9 Don't routinely recommend antidepressants as a first-line treatment for mild depressive symptoms in adults.

Antidepressant response rates are higher for moderate or severe adult depression. For mild depressive symptoms a complete assessment, ongoing support and monitoring, psychosocial interventions and lifestyle modifications should be the first lines of treatment. This approach can avoid the side-effects of medication and establish etiological factors important to future assessment and management. Antidepressants are appropriate in cases of persistent mild depression where a past history of more severe depression exists or where other interventions have failed. If a nurse caring for a patient feels that medication is not the appropriate intervention, the nurse has a responsibility to discuss these concerns with the prescriber.

How the list was created

The Canadian Nurses Association (CNA) established its Choosing Wisely Canada nursing list by convening a 12-member nursing working group (NWG) of diverse nurse experts from across Canada representing a broad range of geographical regions, practice settings and experience. The NWG began considering its potential list by reviewing existing recommendations, including items from Choosing Wisely Canada's specialty societies and the American Academy of Nursing (AAN) Choosing Wisely® list, which had already undergone rigorous evidence reviews. In addition, members brought forward recommendations on new evidence-based items. The NWG appraised 195 items for relevance to nursing using a structured process developed for this work. Each of these (171 Choosing Wisely Canada physician-related items, 15 AAN Choosing Wisely items and nine independently submitted items) was appraised by two independent reviewers. Using a modified Delphi process for the next two rounds of revision, the group then refined and adapted 36 items until reaching consensus on a final nine-item list. A literature review was conducted to confirm the evidence for these items, and supporting nursing research was added where appropriate. Subsequently, the final list underwent extensive consultation, in which further input was obtained from nursing experts in patient safety, various members of the Canadian Network of Nursing Specialties, CNA, its jurisdictional members and patient advocates. In November 2016, the Choosing Wisely Canada nursing list was presented to CNA's board of directors, who gave it their full endorsement and support.

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About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help clinicians and patients engage in conversations about unnecessary tests and treatments and help physicians and patients make smart and effective choices to ensure high-quality care.

For more information on Choosing Wisely Canada or to see other lists of Things Clinicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Nurses Association

The Canadian Nurses Association (CNA) is a proud partner of the Choosing Wisely Canada campaign. CNA is a powerful, unified voice for Canada's registered nurses. It represents registered nurses from 11 provincial and territorial nursing associations and colleges, independent registered nurse members from Ontario and Quebec and retired registered nurses from across the country. CNA advances the practice and profession of nursing to improve health outcomes and strengthen Canada's publicly funded, not-for-profit health system.

Ten Things Physicians and Patients Should Question

1 **Avoid the use of routine episiotomy in spontaneous vaginal births.**

Routine episiotomy has been shown to cause more harm than good. Studies demonstrate that restrictive episiotomy policies are associated with less posterior perineal trauma, less suturing, and fewer complications, with no difference for most pain measures or severe vaginal and/or perineal trauma. When the perineum is preventing delivery, particularly if the fetal heart rate is abnormal, an episiotomy may expedite a vaginal birth.

2 **Don't do electronic fetal monitoring for low risk women in labour; use intermittent auscultation.**

Continuous electronic fetal monitoring (EFM) leads to significantly greater rates of caesareans and operative vaginal deliveries in low risk patients compared to those monitored with intermittent auscultation. Intermittent auscultation results in no significant difference in the number of infant deaths during and shortly after labour, cerebral palsy rates, use of drugs for pain relief, and cord blood acidosis in low risk patients. Further, EFM restricts movement and positioning, excludes the option of using a birthing pool, and requires greater resource use to continuously interpret fetal heart rate tracings. EFM therefore increases risk of intervention and decreases choice without providing meaningful benefit to patient or neonatal outcomes in low risk patients.

3 **Don't perform routine urinalysis (protein, glucose) at every antenatal visit (in low risk normotensive women).**

Routine urinalysis (for glucose and protein) in low-risk pregnancies is not recommended. For screening of healthy pregnant women, urinalysis for glucose to assess the risk of developing gestational diabetes is not recommended due to low sensitivity. For assessing the potential development of preeclampsia in pregnant women, routine urine dipstick or urinalysis are not recommended as the test for albumin levels is unreliable. Do not rely on proteinuria to screen for gestational hypertension; periodically check the blood pressure.

4 **Don't perform umbilical artery Doppler studies as a routine screening test in uncomplicated pregnancies with normal fetal growth.**

Placental integrity, specifically vascular resistance, may be assessed by evaluating flow in the umbilical arteries using Doppler ultrasound. When this is done with high risk pregnancies the perinatal death rate is reduced and interventions may be appropriately timed or withheld. "High risk" in these investigations were principally intrauterine growth restriction and maternal hypertension. When Doppler studies were extended to low-risk pregnancies however there was no improvement in outcome and abnormal results were more likely to be false positives.

5 **Don't use meperidine for labour analgesia due to its long-acting active metabolites and negative effects on neonatal behaviours.**

Meperidine (Demerol) as an opioid analgesic relieves pain of labour but there are superior agents. Furthermore it passes to the fetus and has a particularly long time before elimination. It persists in the neonate and thus interferes with adaptation to extrauterine life and adversely affects breast feeding. Because there are superior choices for analgesia without these adverse effects, meperidine should not be used if alternatives are available.

6 **Don't routinely screen women with Pap smears if under 21 years of age or over 69 years of age.**

Screening should be initiated at 21 years of age in asymptomatic, immunocompetent women. Studies have shown the largest number of false positive test results occurring in adolescents younger than 21 years and have the lowest incidence of cervical cancer. There is no protective effect in screening women younger than 21 years. There are few studies that address the age of cessation. Modelling studies have not shown increase in protective effect when screening women greater than 70 years who have had prior routine screening.

7 Don't routinely order hormone levels including estradiol, progesterone, follicle-stimulating hormone and luteinizing hormone in postmenopausal women or after a hysterectomy, either to diagnose menopause or to manage hormone therapy.

The frequency and severity of menopausal symptoms do not correlate to the levels of either follicle-stimulating hormone (FSH) or serum estradiol. Reproductive estrogen levels are typically much higher than required to reduce symptoms. Management with hormone therapy is based on using the lowest effective dose to reduce symptoms to an acceptable level. Relying on elevated FSH to make a diagnosis may result in women being denied effective therapy for disruptive symptoms; use of an unreliable test may in this way contribute to less than optimal care. Using blood levels to adjust hormone therapy may result in higher doses of hormone therapy than are needed to reduce and manage symptoms.

8 Don't screen for ovarian cancer in asymptomatic women at average risk.

Screening for ovarian cancer does not improve clinical outcomes in asymptomatic women without a family history of the disease. Screening did not decrease all-cause mortality, ovarian cancer mortality or the risk of diagnoses of advanced stage ovarian cancer. There is no demonstrable benefit on mortality following transvaginal ultrasonography or routine pelvic screening examinations and the use of CA125 or other biomarkers for ovarian cancer but such screening resulted in false-positive tests, overdiagnosis, and overtreatment with inevitable complications.

9 Don't offer hysterectomy to women with asymptomatic fibroids on the basis of risk malignancy.

Rapid growth of a fibroid is not a predictor of leiomyosarcoma. In women undergoing surgery for fibroids approximately 1 in 400 (0.25%) is at risk of having a leiomyosarcoma. However, growth and/or new onset of symptoms post-menopause should carry a higher index of suspicion for malignancy. Incidental uterine leiomyosarcomas have been encountered during routine resectoscopic myomectomy, though their incidence appears to be lower than that reported following hysterectomy (0.13%). Leiomyomas and leiomyosarcomas cannot reliably be distinguished clinically or by any imaging technique.

10 Don't do any surgical intervention, including ablation, for abnormal uterine bleeding until medical management (including the progesterone intra-uterine system) has been offered and either declined or found unsuccessful.

There are several non-hormonal and hormonal agents that have proven to be effective in the treatment of abnormal uterine bleeding. Some of these may have the added benefit of providing symptom relief for dysmenorrhoea and offer contraceptive coverage. These agents may help stabilize anaemia and provide symptom relief alone, or may be utilized prior to surgical management of heavy menstrual bleeding. Medical management allows for early initiation of treatment in a primary care setting whereas surgical intervention may be limited by access to specialist consultation and operating facilities. All potential treatment options for abnormal uterine bleeding should be discussed with the patient and their side-effects, relative effectiveness, risks, costs and impact on fertility outlined so that an informed shared treatment decision can be made and a treatment plan instituted.

How the list was created

The Society of Obstetricians and Gynaecologists of Canada (SOGC) struck a small working group to oversee the Choosing Wisely Canada list development process. An initial list of recommendations was compiled from all published SOGC guidelines. The list was reviewed by the Choosing Wisely committee, who provided input and guidance. A long list was then created from four sources: SOGC guidelines, Choosing Wisely recommendations published by American societies (notably the American College of Obstetricians and Gynaecologists), Canadian Choosing Wisely recommendations relevant to Ob/Gyn, and other proposals from SOGC members. The refined list was circulated to all members of the Clinical Practice – Obstetrics and Gynaecology committees then further refined by the Board of Directors. A list consisting of 24 recommendations (sorted based on specialty: obstetrics; gynaecology and generalist) was generated and circulated to the wider SOGC membership to obtain the final list.

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About Choosing Wisely Canada

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For more information on Choosing Wisely Canada or to see other lists of Things Clinicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Society of Obstetricians and Gynaecologists of Canada

The Society of Obstetricians and Gynaecologists of Canada (SOGC) is a proud partner of the Choosing Wisely Canada campaign. The SOGC promotes excellence in the practice of obstetrics and gynaecology and to advance the health of women through leadership, advocacy, collaboration, and education. It has over 3,500 members, comprised of obstetricians, gynaecologists, family physicians, nurses, midwives, and allied health professionals working in the field of sexual reproductive health.

Five Things Physicians and Patients Should Question

1 **Don't endorse clinically unnecessary absence from work.**

There is substantial evidence to support the positive link between work and health (physical, mental and social health). Both employment and income are separate determinants of health and are used as health status indicators. Absence from work contributes to declining health, slower recovery times, and longer duration of disability. Maintaining and restoring working capacity is an important function of health services which improves function and can also impact upon recovery and prognosis. Supporting unnecessary restrictions or total disability (absence from work) creates disability which in turn negatively impacts upon health. When asked to provide an opinion on functional abilities to employers or insurers, the focus should be on abilities; restrictions should be objective, specific, and listed only when absolutely medically indicated.

2 **Don't prescribe opiates for the treatment of acute or chronic non-cancer pain without first assessing side effects, work status, and capacity to drive a motor vehicle.**

Increases in opioid prescribing have been accompanied by simultaneous increases in abuse, serious injuries, and deaths from overdose. Compared to those on no, or lower opiate doses, those prescribed higher opiate doses have increased disability risk and duration. The use of opiates can result in effects such as euphoria, drowsiness or inability to concentrate. Cognitive and psychomotor ability are essential functions for driving a motor vehicle and other complex work tasks. Those who prescribe opiates may be obligated to report a patient's inability to drive safely.

3 **Don't order X-rays for acute low back pain in the absence of red flags.**

Acute low back pain is a common health problem affecting between 50-90% of people over the course of a lifetime with less than 2% of cases representing potentially serious conditions requiring surgical or medical intervention. Red flags suggesting additional testing include such things as a history of significant trauma, cauda equina syndrome, symptoms suggestive of tumour or infection (fever, weight loss, history of cancer), steroid use, etc. However, the majority of acute low back pain episodes are benign, self-limited cases that do not warrant any imaging studies. Unnecessary imaging can be harmful due to the potential adverse health effects associated with radiation exposure and due to attribution of symptoms to unrelated incidental findings leading to prolonged disability.

4 **Don't order blood mercury levels unless: dietary history suggests risk; the patient is pregnant or planning to become pregnant; and/or the patient is occupationally exposed to organomercury compounds.**

Although clinically significant exposures may still occur in Canada, less than 1% of Canadian adults have total blood mercury concentrations above Health Canada's guidance value. As such, the large majority of individuals who present with concerns of metal toxicity do not actually have toxicity, and testing results in false positives (values above the reference range but not in the range of toxicity). Occupationally exposed workers and childbearing women are susceptible subgroups therefore testing in these populations is warranted in cases where a careful occupational and/or environmental history suggests a significant exposure. In the absence of clinical presentation and history indicating toxicity risk, testing should be avoided because it may lead to misinterpretation and unnecessary concern or interventions (dietary restriction, chelation) that may cause harm.

5 **Don't repeat chest X-rays when screening exposed workers for asbestosis unless clinical indications are present.**

Asbestosis generally becomes manifest clinically 15-20 years after the onset of exposure. High resolution CT (HRCT) is more sensitive than both chest radiography and conventional CT for detecting parenchymal fibrosis (asbestosis) but a normal HRCT scan cannot completely exclude asbestosis. Given the long latency between asbestos exposure and asbestosis and given that no effective treatment is available to improve the outcome, screening and early detection of asbestosis is unlikely to allow any remedial action to be taken in the workplace or to confer any health advantage on asbestos-exposed individuals. Repeated imaging exposes the patient to radiation, which is not without risk. Therefore, while it is appropriate to obtain a baseline X-ray at the time of first assessment, for screening purposes, radiation risk outweighs the benefit of frequent chest X-rays. Radiation exposure would also be a concern for repeated CT scans.

How the list was created

The Occupational Medicine Specialist of Canada (OMSOC) established its *Choosing Wisely Canada* Top 5 recommendations by consensus and literature review methods. The first step was to examine the list and references developed and provided to us by The American College of Occupational and Environmental Medicine (ACOEM). This list was used as a starting point for extensive survey consultation with the membership of OMSOC and also with the membership of The Occupational and Environmental Medicine Association of Canada (OEMAC). This process enabled input from a breadth of health care providers working in the field of occupational medicine, including both occupational medicine specialists as well as family medicine practitioners with a special interest in the field. The comments and topic suggestions that emerged from this consultation were qualitatively categorized by an OMSOC member with expertise in qualitative research. There was high initial agreement; the emergent topics fit into 6 categories overall, 5 of which are represented on the list. The excluded item was least consistent with a campaign to help physicians and patients engage in conversations about the overuse of tests and procedures because of its administrative nature. With the assistance of Health Quality Ontario, a small committee reviewed literature, identified clinical practice guideline repositories, and organizational and government statements to identify the supporting references. Draft list items, rationale statements, and references were provided to members of OMSOC and also made available to OEMAC for feedback. This resulted in minor modifications to specific wording but no changes to topics. The Board of Directors of OMSOC reviewed and approved the *Choosing Wisely Canada* list.

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About Occupational Medicine Specialists of Canada

Occupational Medicine Specialists of Canada (OMSOC) is a proud partner of the Choosing Wisely Canada campaign. OMSOC's membership comprises occupational physicians certified as specialists by The Royal College of Physicians and Surgeons of Canada or le Collège des Médecins du Québec as well as specialists from other medical and surgical specialties with an interest in occupational medicine. OMSOC provides a forum for advancing the practice of occupational medicine by facilitating dialogue amongst physician specialists and between occupational medicine practitioners and members of allied fields, notably government, industry, management, and the law.

Ten Things Physicians and Patients Should Question

1 **Don't order tests to detect recurrent cancer in asymptomatic patients if there is not a realistic expectation that early detection of recurrence can improve survival or quality of life.**

In some specific situations, the early detection of cancer recurrence (local and/or distant) may increase the likelihood of successful subsequent curative treatment. However, in many circumstances, earlier knowledge of recurrence does not improve outcome. As such, it is important to balance the information that can come from advanced testing with what is best for the individual patient. Specifically, the need for patient reassurance should be balanced against the anxiety and uncertainty provoked by extensive follow-up testing when there is not a realistic expectation that the early identification of recurrence may improve survival or quality of life.

2 **Don't perform routine cancer screening, or surveillance for a new primary cancer, in the majority of patients with metastatic disease.**

Screening for cancer can be lifesaving in otherwise healthy at-risk patients. While screening tests lead to a mortality benefit which emerges years after the test is performed, they expose patients to immediate potential harms. In general, patients with metastatic cancer have competing mortality risks that would outweigh the mortality benefits of screening as demonstrated in healthy patients. In fact, patients with metastatic disease may be more likely to experience harm since patients with limited life expectancy are more likely to be frail and more susceptible to complications of testing and treatments. Therefore, the balance of potential benefits and harms does not favor recommending screening for a new asymptomatic primary malignancy in most patients with metastatic disease. Screening may be considered in a very small subgroup of patients where metastatic disease is relatively indolent, or its treatment is expected to result in prolonged survival.

3 **Avoid chemotherapy and instead focus on symptom relief and palliative care in patients with advanced cancer unlikely to benefit from chemotherapy (e.g., performance status 3 or 4).**

Studies show that, in general, cancer directed treatments are likely to be ineffective for patients with solid organ tumours who are markedly debilitated by their cancer (i.e., performance status 3 or 4). Exceptions may include patients with functional limitations due to other conditions resulting in a low performance status, or selected patients with specific disease types (e.g., germ cell cancer) or characteristics (e.g., mutations) that suggest a high likelihood of response to therapy. It has also been shown that appropriate symptom control and palliative care can significantly improve quality of life.

4 **Don't perform routine colonoscopic surveillance every year in patients following their colon cancer surgery; instead, frequency should be based on the findings of the prior colonoscopy and corresponding guidelines.**

Studies have shown clearly that, in the absence of heredity syndromes, the progression from polyp to cancer (adenoma carcinoma sequence) occurs over many years. Thus, the timing of a follow-up surveillance colonoscopy should be determined based on the results of a previous high-quality colonoscopy. Typical colonoscopic surveillance following colon cancer surgery consists of a colonoscopy at one year; thereafter it should not typically exceed every 3 years following detection of an advanced polyp, or every 5 years following a normal exam or one showing small polyps. In Canada, there is both evidence of overuse of surveillance colonoscopy following colon cancer resection and, in areas, a limited availability of endoscopy resources.

5 **Don't delay or avoid palliative care for a patient with metastatic cancer because they are pursuing disease-directed treatment.**

Numerous studies—including randomized trials—show that palliative care improves pain and symptom control, improves family satisfaction with care, and reduces costs. Palliative care does not accelerate death, and may prolong life in selected populations. The benefits of disease-directed treatment (e.g., chemotherapy or radiation) can be enhanced by early consideration of palliative care.

6 Don't recommend more than a single fraction of palliative radiation for an uncomplicated painful bone metastasis.

Randomized trials have established that single-fraction radiation to a previously unirradiated, uncomplicated peripheral bone or vertebral metastasis provides comparable pain relief and morbidity compared to multiple-fraction regimens, while optimizing patient and caregiver convenience. Although it results in a higher incidence of retreatment at a later date (20% vs. 8 % for multi-fraction regimens), the decreased patient burden usually outweighs any considerations of long-term effectiveness for those with a limited life expectancy.

7 Don't initiate management in patients with low-risk prostate cancer (T1/T2, PSA < 10 ng/ml, and Gleason score < 7) without first discussing active surveillance.

Patients with localized prostate cancer have a number of reasonable management options. These include surgery, radiation, as well as conservative monitoring without therapy in appropriate patients. Shared decision-making between the patient and the physician can lead to better alignment of patient goals with treatment and more efficient care delivery. The use of patient-directed written decision aids concerning prostate cancer can give patients confidence about their choices, and improve compliance with therapy. Discussion regarding active surveillance should include both the elements and timing of such surveillance, and emphasize the need for compliance.

8 Don't initiate whole breast radiotherapy in 25 fractions as a part of breast conservation therapy in women age ≥50 with early stage invasive breast cancer without considering shorter treatment schedules.

Whole breast radiotherapy is beneficial for most women with invasive breast cancer treated with breast conservation therapy. Many studies have utilized "conventionally fractionated" schedules that deliver therapy over 5 to 6 weeks, often followed by 1 to 2 weeks of boost therapy. However, more recent evidence (including a major study from Canada) has demonstrated equivalent tumour control and cosmetic outcome in specific patient populations with shorter courses of therapy (approximately 3 to 4 weeks). Patients and their physicians should review these options to determine the most appropriate course of therapy.

9 Don't deliver care (e.g., follow-up) in a high-cost setting (e.g., inpatient, cancer center) that could be delivered just as effectively in a lower-cost setting (e.g., primary care).

Several studies (including randomized clinical trials) have demonstrated that surveillance following definitive cancer therapy can be performed equally well, and in a more patient-centered fashion, within a primary care setting. With the substantial increase in cancer survivors, the traditional practice of providing routine follow-up care through specialist cancer centres is placing rising demands and competing with other care delivery functions of such centres. Primary care providers are both willing to provide follow-up cancer care and have repeatedly assumed such responsibility. Despite this, the transition to primary care in Canada has been both variable and incomplete.

10 Don't routinely use extensive locoregional therapy in most cancer situations where there is metastatic disease and minimal symptoms attributable to the primary tumour (e.g., colorectal cancer).

In the past, extensive local regional therapies (e.g., surgery) were often provided in patients with metastatic disease, regardless of the symptomatology of the primary tumour. However, recent evidence has suggested that in many cases these therapies do not improve outcome and, at times, delay the more important treatment of metastatic disease (e.g., chemotherapy). In general, patients with metastatic disease from solid organ malignancies and a relatively asymptomatic primary tumour should be considered for systemic therapy as a priority; the delay in systemic therapy and potential additional morbidity arising from extensive locoregional therapies should be avoided in these patients.

How the list was created

To help create the cancer specific list for *Choosing Wisely Canada*, a Tri-Society Task Force was convened by the Canadian Partnership Against Cancer in late 2013. The Task Force included representatives from the Canadian Association of Radiation Oncology (CARO), Canadian Association of Medical Oncologists (CAMO) and Canadian Society of Surgical Oncology (CSSO). Through a multipronged consensus process of the Task Force, along with broader society member engagement, an initial list of 66 practices was generated. In addition, a framework for subsequent selection of low value/harmful practices was established and included the following elements: (1) the size of population to which practice is relevant; (2) the frequency of use of the practice in Canada; (3) the cost of the practice; (4) the evidence/degree of harm of practice; and (5) the potential for change in use of the practice. Based on this framework, and after an iterative adjudication and voting process, this list was first reduced to a long list of 41 practices, then to a short list of 19 practices, and subsequently to a final list of 10 low value, unnecessary, or harmful practices. Many practices were considered, including cancer-related practices previously identified in the U.S. Choosing Wisely® campaign. Recommendation 3 was adapted with permission from the Five Things Physicians and Patients Should Question. © 2014 American Society of Clinical Oncology. All rights reserved. Recommendations 5 and 6 were adapted with permission from the Five Things Physicians and Patients Should Question. © 2013 American Academy of Hospice and Palliative Medicine. Recommendations 7 and 8 were adapted with permission from the Five Things Physicians and Patients Should Question. © 2013 American Society for Radiation Oncology.

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About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care. For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Partnership Against Cancer

The Canadian Partnership Against Cancer (CPAC) is a proud partner of the *Choosing Wisely Canada* campaign. CPAC is an independent organization funded by the federal government to accelerate action on cancer control for all Canadians. CPAC works with cancer experts, charitable organizations, governments, cancer agencies, national health organizations, patients, survivors and others to implement Canada's cancer control strategy.

About Canadian Association of Radiation Oncology

The Canadian Association of Radiation Oncology (CARO) is a proud partner of the *Choosing Wisely Canada* campaign. CARO is a national professional association representing the official voice of radiation oncology in Canada in relation to the public interest and professional interest in the provision of radiation oncology consultative and treatment services. The association's regionally representative board structure and national membership facilitate the execution of its mission.

About The Canadian Society of Surgical Oncology

The Canadian Society of Surgical Oncology (CSSO) is a proud partner of the *Choosing Wisely Canada* campaign. The CSSO is a national association of surgical oncologists that promotes the optimum treatment of the patient with cancer through a multi-disciplinary treatment approach. The association fosters the development of education in cancer for both graduate, undergraduate and continuing medical education and encourages the development of research in oncologic surgery. The CSSO believes in facilitating communication between surgeons whose primary interest lies in the field of oncology and encourages the formation of surgical oncology training programs among Canadian Universities.

About The Canadian Association of Medical Oncologists

The Canadian Association of Medical Oncologists (CAMO) is a proud partner of the *Choosing Wisely Canada* campaign. CAMO, a national specialty society of the Royal College of Physicians and Surgeons of Canada, will contribute to cancer control, through research, education, and clinical practice in prevention, screening, diagnosis, treatment, supportive care, palliative care and rehabilitation. CAMO is committed to achieving and maintaining, among its members, excellence in clinical and scholarly activity, within a culture of compassion and respect for human dignity.

Five Things Physicians and Patients Should Question

1 Avoid performing routine post-operative deep vein thrombosis ultrasonography screening in patients who undergo elective hip or knee arthroplasty.

Since ultrasound is not effective at diagnosing unsuspected deep vein thrombosis (DVT) and appropriate alternative screening tests do not exist, if there is no change in the patient's clinical status, routine post-operative screening for DVT after hip or knee arthroplasty does not change outcomes or clinical management.

2 Don't use needle lavage to treat patients with symptomatic osteoarthritis of the knee for long-term relief.

The use of needle lavage in patients with symptomatic osteoarthritis of the knee does not lead to measurable improvements in pain, function, 50-foot walking time, stiffness, tenderness or swelling.

3 Don't use glucosamine and chondroitin to treat patients with symptomatic osteoarthritis of the knee.

Both glucosamine and chondroitin sulfate do not provide relief for patients with symptomatic osteoarthritis of the knee.

4 Don't use lateral wedge insoles to treat patients with symptomatic medial compartment osteoarthritis of the knee.

In patients with symptomatic osteoarthritis of the knee, the use of lateral wedge or neutral insoles does not improve pain or functional outcomes. Comparisons between lateral and neutral heel wedges were investigated, as were comparisons between lateral wedged insoles and lateral wedged insoles with subtalar strapping. The systematic review concludes that there is only limited evidence for the effectiveness of lateral heel wedges and related orthoses. In addition, the possibility exists that those who do not use them may experience fewer symptoms from osteoarthritis of the knee.

5 Don't use post-operative splinting of the wrist after carpal tunnel release for long-term relief.

Routine post-operative splinting of the wrist after the carpal tunnel release procedure showed no benefit in grip or lateral pinch strength or bowstringing. In addition, the research showed no effect in complication rates, subjective outcomes or patient satisfaction. Clinicians may wish to provide protection for the wrist in a working environment or for temporary protection. However, objective criteria for their appropriate use do not exist. Clinicians should be aware of the detrimental effects including adhesion formation, stiffness and prevention of nerve and tendon movement.

How the list was created

The Canadian Orthopaedic Association (COA) established its *Choosing Wisely Canada* Top 5 recommendations by asking its National Standards Committee to review the evidence base associated with the five treatments and procedures chosen by the American Academy of Orthopaedic Surgeons for the Choosing Wisely® campaign in the United States. Satisfied that the list was relevant to the Canadian clinical context, the Committee recommended its adoption to the COA's Executive Committee, and the motion was then unanimously approved by the Board of Directors. Therefore, all five items were adopted with permission from the *Five Things Physicians and Patients Should Question*. © 2013 American Academy of Orthopaedic Surgeons

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About Choosing Wisely Canada

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About The Canadian Orthopaedic Association

The Canadian Orthopaedic Association (COA) is a proud partner of the *Choosing Wisely Canada* campaign. With some 1,300 members, the COA is the national professional association that represents Canada's orthopaedic surgeons. Its mandate is to promote excellence in bone and joint care through continuing professional development, models of care, practice-management strategies, government relations and a code of ethics. The COA has met annually since 1945, providing a venue for Canada's orthopaedic surgeons to update and refine their skills, as well as discuss and respond to professional and patient issues. Faced with increasing subspecialization, the COA has avoided fragmentation by forming subspecialty societies within the parent organization. Thus, the COA continues to speak with a united voice on behalf of the orthopaedic community in Canada.



Five Things Physicians and Patients Should Question

1 **Don't order specialized audiometric and vestibular neurodiagnostic tests in an attempt to screen for peripheral vestibular disease.**

The diagnosis of the dizzy patient should be guided by the presenting symptoms and office examination. Tests such as ABR (auditory brainstem response), ECOG (electrocochleography), ENG/VNG (electronystagmography/ videonystagmography), VEMP (vestibular evoked myogenic potential), vHIT (video head impulse test), CDP (computerized dynamic posturography) and RCT (rotational chair testing) should only be ordered if clinically indicated. In general, advanced balance tests should be ordered and interpreted by otolaryngologists with specialized training in the diagnosis and treatment of vestibular disorders (otologists/neurotologists). Clinical indications for testing can include: side localization and stage of progression for Meniere's disease, assessment of central compensation for acute vestibular loss and confirmation of superior semicircular canal dehiscence syndrome. Specialized tests are rarely indicated in the management of benign paroxysmal positional vertigo.

2 **Don't perform computed tomography or blood work in the evaluation of a patient with sudden sensorineural hearing loss (SSNHL) given its presumed viral etiology.**

Blood work which typically would consist of a CBC, differential and electrolytes along with an autoimmune panel are often normal and would not change initial clinical management if abnormal. The CT scan which is done to rule out central causes is not sensitive enough to pick up most cases of retrocochlear pathology. MRI scans should be considered instead. If verified to be sensorineural with audiometric testing, urgent treatment with steroid therapy can be initiated. There is no role for antiviral treatment, thrombolytics or vasoactive substances.

3 **Don't perform auditory brainstem responses (ABR) in patients with asymmetrical hearing loss. Asymmetrical hearing loss is defined as bone conduction threshold difference of:**

- 20 dB threshold difference at a single frequency
- 15 dB threshold difference at 2 frequencies
- 10 dB threshold difference at 3 frequencies

If there is no obvious cause of the asymmetry such as unilateral trauma or unilateral noise exposure like gun blasts, a MRI should be ordered. MRI scans are superior in sensitivity for detecting retrocochlear pathologies such as vestibular schwannoma when compared to ABR testing.

4 **Don't use oral antibiotics as a first line treatment for patients with painless ear drainage associated with a tympanic membrane perforation or tympanostomy tube unless there is evidence of developing cellulitis in the external ear canal skin and pinna.**

First line therapy constitutes a short course of topical antibiotic/steroid drops. The potential ototoxicity of any topical medication entering the middle ear space should be considered in selecting an appropriate agent. Where available, fluoroquinolone combination preparations (e.g., ciprofloxacin and dexamethasone) should be used as a first choice and caution should be exercised in using topical aminoglycosides. Microdebridement and further assessment should be considered in the following circumstances: (a) failure to respond after a 7 day course, or (b) where follow up does not permit a clear view of a normal tympanic membrane allowing the exclusion of more sinister middle ear disease such as cholesteatoma.

5 **Don't perform particle repositioning maneuvers (Epley or Semont) without a clinical diagnosis of posterior semicircular canal benign paroxysmal positional vertigo in the affected ear.**

Posterior semicircular canal benign paroxysmal positional vertigo should be diagnosed and confirmed with a positive Dix-Hallpike test, and only then should a particle repositioning maneuver be performed. If a patient with positional vertigo has a Dix-Hallpike test that is repeatedly negative or results in atypical nystagmus, less common BPPV variants or central positional vertigo should be considered.

How the list was created

This list was created by the Otology & Neurotology subspecialty group of the Canadian Society of Otolaryngology – Head & Neck Surgery. Members of the group, representing the national leaders within the subspecialty were asked to create a list of recommendations for unnecessary tests that were seen to be commonly ordered or unnecessary interventions that were commonly performed. These unnecessary tests and interventions are often invasive and incur risk to patients and unwarranted costs to our public health care system. The evidence was then reviewed to further refine the recommendations. The final version of the list was then circulated and approved by the members of the group.

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About The Canadian Society of Otolaryngology-Head & Neck Surgery

The Canadian Society of Otolaryngology-Head & Neck Surgery (CSOHNS) is a proud partner of the Choosing Wisely Canada campaign. CSOHNS is an association that helps to serve the Canadian Otolaryngology-Head & Neck Surgery community. It is composed exclusively of otolaryngologists-head & neck surgeons and those training in the specialty. CSOHNS is dedicated to improving patient care through the support of education, the promotion of research, the dissemination of information, the scientific advancement of the Society, and the maintenance of high professional and ethical standards.

Six Things Physicians and Patients Should Question

1 Don't order a routine ultrasound for umbilical and/or inguinal hernia.

Umbilical and inguinal hernias are one of the most common reasons a primary care patient may need referral for surgical intervention. The history and physical examination are usually sufficient to make the diagnosis. The routine use of ultrasound for these two conditions is not necessary and will not help the pediatric surgeon to reach a diagnosis.

2 Don't order C-reactive protein (CRP) levels in children with suspected appendicitis.

Appendectomy is one of the most common surgical conditions in children. The diagnosis of appendicitis should be based on clinical findings coupled, where necessary, with imaging. Evidence shows that the routine measurement of CRP levels in patients with suspected appendicitis is not necessary and will not affect the physician's diagnosis.

3 Don't do computed tomography (CT) for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option.

Although CT is accurate in the evaluation of suspected appendicitis in the pediatric population, ultrasound is nearly as good in experienced hands. Appendicitis may be diagnosed based on physical examination. If imaging is needed, ultrasound (including serial ultrasounds) are the preferred initial modality in children. If the results of the ultrasound exams are equivocal, it may be followed by CT. This approach reduces potential radiation risks and has excellent accuracy, with reported sensitivity and specificity of 94 percent.

4 Don't order a routine ultrasound for children with undescended testes.

Undescended testes is the most common congenital genitourinary anomaly in boys. Diagnosis is made on physical examination and if necessary, imaging. The evidence shows that it is not necessary to order a routine ultrasound in children with suspected undescended testes before referring to a pediatric surgeon.

5 Don't delay referral for undescended testes beyond 6 months of age.

The ideal timing for surgical correction of undescended testes is 6 months – 1 year of age. Orchiopexy should not be performed before 6 months of age, as testes may descend spontaneously during the first few months of life. The highest quality evidence recommends orchiopexy between 6 and 12 months of age. Surgery during this time frame may optimize spermatogenic functions.

6 Don't delay testing for total and conjugated (direct) bilirubin in any newborn with persistent jaundice beyond 2 weeks of age.

Biliary atresia clinically manifests by 2 weeks of age with jaundice due to a conjugated hyperbilirubinemia and pale acholic stools. All babies with jaundice persisting beyond 2 weeks should have a blood test for total and conjugated (direct) bilirubin. If the conjugated (direct) bilirubin fraction is >20% of the total bilirubin, prompt referral to assess for biliary atresia is necessary. Timely diagnosis and early surgical intervention before 30 days of age offers the best outcomes for patient survival with their own liver without the need for liver transplantation. For more information please see www.cbar.ca.

How the list was created

The Canadian Association of Pediatric Surgeons (CAPS) established its Choosing Wisely Canada Top 6 recommendations by consensus among CAPS members during the winter CAPS meeting in Calgary (March 2015).

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About The Canadian Association of Paediatric Surgery

The Canadian Association of Paediatric Surgery (CAPS) is a proud partner of the *Choosing Wisely Canada* campaign. The CAPS is dedicated to improving the health of children and committed to making a difference in the lives of children, youth and families by improving quality of health care through education and research. The three main areas of diagnosis, treatment and research which are of special concern to Pediatric Surgeons include Infants Born With Congenital Anomalies, Malignancy In Childhood and Trauma.

Five Things Physicians and Patients Should Question

1 Don't routinely use acid blockers or motility agents for the treatment of gastroesophageal reflux in infants.

Medications that decrease acidity in the stomach do not improve infants' crying or spitting up. These symptoms are common and usually improve on their own, as the child grows up. Studies show that infants who take medications that block stomach acid secretion have more respiratory and gastrointestinal infections. Motility agents do not improve symptoms of reflux in infants but they can have side effects on the heart and nervous system, as well as dangerous interactions with other medications. For example, domperidone can increase the QTc interval on the EKG, particularly when used with other medications that affect liver metabolism, and metaclopramide can cause tardive dyskinesia. Infants with gastroesophageal reflux and poor growth, who have recurrent respiratory problems or who bleed from their gastrointestinal tract, need further evaluation and may need medication. However, most infants will not need them.

2 Don't perform screening panels (IgE tests) for food allergies without previous consideration of the pertinent medical history.

Allergy tests for food may be falsely positive when they are performed in children who don't have a history suggesting a serious (IgE mediated) allergy to that food. These results can lead to avoidance of foods to which a true allergy has not been validly documented. When symptoms suggest a food allergy, a careful history should be completed before ordering specific tests, and these should be selected based on the history. A history that suggests serious allergy to a food may include: (1) combinations of the skin, ocular, respiratory, gastrointestinal and cardiovascular symptoms of anaphylaxis that occur within minutes to hours of eating the specific food, or (2) moderate to severe atopic dermatitis. Testing should be selected based on the history and should not include large screening panels.

3 Don't administer psychostimulant medications to preschool children with Attention Deficit Disorder (ADD), but offer parent-administered behavioural therapy.

The treatment of preschool-aged children with ADD should involve evidence-based behavioural therapy first, as it is more effective than psychostimulants in this age group. Preschool-aged children are more sensitive to all psychostimulant side effects, including those associated with growth velocity. Behavioural therapy requires more time and resources, but the benefits are more sustained with minimal adverse events.

4 Don't routinely do a throat swab when children present with a sore throat if they have a cough, rhinitis, or hoarseness as they almost certainly have viral pharyngitis.

When children with a sore throat present symptoms strongly suggestive of viral illness, such as a runny nose (rhinorrhea), cough or a hoarse voice, a throat swab is unlikely to change management, as these children seldom have 'Strep Throat' as the cause of their sore throat.

5 Don't recommend the use of cough and cold remedies in children under six years of age.

Cough and cold remedies sold over the counter often contain combinations of several medications. Research shows that they are not effective when given to children. They can, however, cause serious harmful effects, including accidental overdose, particularly when combined with other medications. For these reasons, since 2008, Health Canada has advised against their use in children less than six years of age.

How the list was created

The Canadian Paediatric Society (CPS) established its Choosing Wisely Canada list through the leadership of a 7-member task force. CPS Committee Chairs and Section Presidents were consulted and sought input from committee and section executive members about items they felt should be included in the campaign. They were made aware of the American Academy of Pediatrics' list as well as the Society of Hospital Medicine's Pediatric Hospital Medicine list, published through the American Choosing Wisely® campaign. Current CPS statements were also considered during list development. Committees' and sections' submissions were reviewed by the task force. Using Delphi methodology, the task force established a list of 7 topics that were submitted to the CPS Board, including some recommendations that were previously made by other medical associations or societies. Principles used to inform decision-making were the following: a) is lack of effectiveness of the test, intervention or treatment well supported by evidence; b) is there evidence of harm resulting from unnecessary use of the test, intervention or treatment; c) is the test, intervention or treatment used commonly by physicians and health care workers treating children across Canada. The list was reviewed by the CPS Board and Executive and was narrowed down to five items.

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Five Things Physicians and Patients Should Question

1 Don't delay palliative care for a patient with serious illness who has physical, psychological, social or spiritual distress because they are pursuing disease-directed treatment.

Palliative care provides an added layer of support to patients with life-limiting disease and their families. Symptomatic patients can benefit regardless of their diagnosis, prognosis or disease treatment regimen. Studies show that integrating palliative care with disease-modifying therapies improves pain and symptom control, as well as patient quality of life and family satisfaction. Early access to palliative care has been shown to reduce aggressive therapies at the end of life, prolong life in certain patient populations, and significantly reduce hospital costs.

2 Don't delay advance care planning conversations.

Advance care planning is a process, which includes choosing a surrogate or alternate decision-maker and communicating values or wishes for medical care. This helps prepare a person for in-the-moment medical decision-making, as well as guiding their surrogate or alternate decision-maker should the person lose capacity for decision-making. Advance care planning is appropriate for healthy adults and patients with their family and healthcare providers, early, recurrently, and as circumstances change. Evidence shows that advance care planning conversations improve patient and family satisfaction with care and concordance between patients' and families' wishes, increase the completion of advance care planning documents, reduce the likelihood of patients receiving hospital care and the number of days spent in hospital, and increase the likelihood of receiving hospice care.

3 Don't use oxygen therapy to treat non-hypoxic dyspnea.

Oxygen is frequently used to relieve shortness of breath in patients with advanced illness; however, supplemental oxygen does not benefit patients who are breathless but not hypoxic. Supplemental flow of air has been found equally effective to oxygen in this context.

4 Don't use stool softeners alone to prevent opioid induced constipation.

Docusate is a widely used stool softener. A review of the evidence found that docusate is no more effective than placebo in the prevention or management of constipation and suggests that the drug has very little utility when given alone for opioid-induced constipation. Compared with placebo, docusate did not increase stool frequency or soften the stool. Docusate also failed to alleviate the common symptoms of opioid-induced constipation such as difficulty passing stools, hard stools, abdominal cramping, and incomplete stool passage.

5 Don't transfuse red blood cells for arbitrary hemoglobin or hematocrit thresholds in the absence of symptoms, or if no benefit was perceived from previous transfusions.

Indications for blood transfusion depend on clinical assessment and are also guided by the etiology of the anemia. No single laboratory measurement or physiologic parameter can predict the need for blood transfusion. Transfusions are associated with increased morbidity and mortality in high-risk hospitalized inpatients. Adverse events range from mild to severe, including allergic reactions, acute hemolytic reactions, anaphylaxis, transfusion related acute lung injury, transfusion associated circulatory overload, and sepsis.

How the list was created

The Canadian Society of Palliative Care Physicians (CSPCP) established its *Choosing Wisely Canada* Top 5 recommendations by first establishing a small group of its members to compile a short list of 10 suggestions. Recommendations were based on experience and relevance to palliative care practice in Canada. The short list was circulated to the CSPCP board members and to all relevant national and provincial palliative care bodies representing a broad range of geographical regions, practice settings, institution types and experience for feedback. Following this review, members of the CSPCP were asked to participate in an online survey and rank the 10 suggestions in order of importance and relevance. The online survey was launched at the Annual International CSPCP conference. From the feedback of the survey the top 5 suggestions were chosen and refined. The recommendations were discussed and revised with the Choosing Wisely Canada campaign team to ensure the recommendations were in keeping with the overall campaign objectives. A literature search to support the recommendations was completed with the assistance of the independent Canadian Agency for Drugs and Technologies in Health (CADTH) and Health Quality Ontario (HQP). Item 1 was adapted with permission from the Five Things Physicians and Patients Should Question in Hospice and Palliative Medicine. © 2013 American Academy of Hospice and Palliative Medicine. Item 5 was adopted with permission from the Five Things Physicians and Patients Should Question. © 2014 Canadian Society of Internal Medicine.

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About The Canadian Society of Palliative Care Physicians

The Canadian Society of Palliative Care Physicians (CSPCP) is a proud partner of the *Choosing Wisely Canada* campaign. CSPCP is a membership organization composed of clinicians, educators, academics, researchers and specialists dedicated to the improvement of palliative care for patients and their families, through the advancement and improvement of palliative medicine and training.

Five Things Physicians and Patients Should Question

1 Don't perform population based screening for 25-OH-Vitamin D deficiency.

Vitamin D deficiency is common in many populations, particularly in patients at higher latitudes, during winter months and in those with limited sun exposure. Over the counter Vitamin D supplements and increased summer sun exposure are sufficient for most otherwise healthy patients. Laboratory testing is appropriate in higher risk patients when results will be used to institute more aggressive therapy (e.g., osteoporosis, chronic kidney disease, malabsorption, some infections).

2 Don't screen women with Pap smears if under 21 years of age or over 69 years of age.

Follow provincial guidelines for cervical cancer screening. Screening before the recommended age of initiation (age 21 in most provinces), screening women over the age of 69, or annual screening is not recommended.

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

Most preoperative laboratory tests (typically a complete blood count, prothrombin time and partial thromboplastin time, basic metabolic panel and urinalysis) performed on elective surgical patients are normal. Findings influence management in under 3% of patients tested. In almost all cases, no adverse outcomes are observed when clinically stable patients undergo elective surgery, irrespective of whether an abnormal test is identified. Preoperative laboratory testing is appropriate in symptomatic patients and those with risks factors for which diagnostic testing can provide clarification of patient surgical risk.

4 Avoid standing orders for repeat complete blood count (CBC) on inpatients who are clinically/laboratorily stable.

Standing orders for inpatients for CBC testing should be avoided as this can lead to over-testing in relatively stable patients. Particularly in patients with longer term hospital stays, there is some evidence that repeated blood testing can have a negative effect on patients including some increase in anemia. Trauma patients often have blood draws repeated frequently even in the absence of indications of hematologic instability on admission.

5 Don't send urine specimens for culture on asymptomatic patients including the elderly, diabetics, or as a follow up to confirm effective treatment.

There is no evidence that antibiotic treatment is indicated in any of these patients. Thus sending urine specimens in asymptomatic patients will only result in inappropriate antibiotic use and increased risk of resistance. The only exceptions are screening of pregnant women early in pregnancy for whom there are clear guidelines for screening/management; and screening for asymptomatic bacteriuria before urologic procedures for which mucosal bleeding is anticipated.

How the list was created

The Canadian Association of Pathologists (CAP-ACP) list of recommendations was developed in conjunction with the Canadian Leadership Council on Laboratory Medicine Laboratory (CLCLM) Utilization Subcommittee, under the joint leadership of the President of CAP-ACP and the President of the Canadian Society of Clinical Chemists (CSCC). The joint committee reviewed the recommendations made by the American Society for Clinical Pathology (ASCP) to the Choosing Wisely US campaign and modified two of those to reflect Canadian practice. Additional recommendations, dealing with cervical cancer screening, standing orders for hematology testing and urine cultures on asymptomatic patients, were added to make up the set of recommendations. The joint committee solicited review and input on these recommendations from the various subspecialty groups in laboratory medicine. Recommendations 1 and 3 were adopted with permission from the Five Things Physicians and Patients Should Question. © 2013 American Society for Clinical Pathology.

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About The Canadian Association of Pathologists

The Canadian Association of Pathologists (CAP-ACP), is a proud partner of the *Choosing Wisely Canada* campaign. The CAP-ACP was founded in 1949 and has in the years since then played a role in promoting pathology to the national and international health care communities and to Canadian society. CAP-ACP, a voluntary professional organization, advances the interests of our profession and promotes high quality standards for patient care by providing national leadership and promoting excellence in pathology and laboratory medicine practice, education and research.

Five Things Physicians and Patients Should Question

1 Don't order a CT to initially investigate macrocephaly (order an ultrasound or MRI).

A common pediatric neurosurgery referral is a young child with a rapidly increasing head circumference crossing percentiles. The differential diagnosis is broad and includes benign expansion of the subarachnoid spaces (BESS), subdural collections, hydrocephalus, and neoplasm. When the fontanelle is open, the etiology can usually be diagnosed on head ultrasound, and this should therefore be the initial screening test of choice. In the absence of an open fontanelle, or if there are other signs and symptoms of acute raised intracranial pressure (vomiting, headache, irritability, drowsiness, full fontanelle, sun setting eyes), the etiology should be diagnosed with MRI, if available, in order to limit radiation exposure. There is growing evidence that exposure to radiation through CT imaging increases a child's life long risk of cancer, and so all care should be taken to minimize this exposure as much as possible. Ultrasound (when fontanelle open), and/or MRI (when fontanelle closed), are therefore the screening tests of choice to investigate macrocephaly.

2 Don't image a midline dimple related to the coccyx in an asymptomatic infant or child.

Sacroccocygeal dimples (also called simple sacral dimples or sacroccocygeal pits) are common findings in newborns, with a prevalence of approximately 2 to 5%. They are not associated with any increased risk of occult spinal dysraphism (e.g., low lying conus, fatty filum, lipomyelomeningocele, split cord malformation, dermal sinus tract, etc.) compared with the general population of infants without sacroccocygeal dimples. There is therefore no need to investigate infants with this finding, with either ultrasound or MRI. Red flags for which investigating would be indicated include the presence of midline tuft of hair, sacral dimple or sinus tract above the gluteal cleft, hemangioma, dermal appendage, and/or a subcutaneous lump. The ideal choice for initial investigation (ultrasound or MRI) would depend on the specific cutaneous findings and clinical symptoms present.

3 Don't use CT scans for routine imaging of children with hydrocephalus. Fast sequence non-sedated MRIs or ultrasounds provide adequate information to assess patients without exposing them to radiation or an anesthetic.

Children with hydrocephalus, on average, obtain two head imaging assessments annually until the age of 20. Their lifetime increase risk of fatal cancer is estimated to be 1 excess case of fatal cancer per 97 patients if standard head CT is used, or 1 excess case of fatal cancer per 230 patients if low-dose head CT is used. Head ultrasound (in infants with open fontanelles), and rapid sequence MRI (in all other children) do not require ionizing radiation and adequately assess for radiographic change in ventricle size. A rapid sequence MRI can be obtained without sedation and in under 3 minutes. It is therefore recommended that ultrasound (in infants with open fontanelles), or rapid sequence MRI (in all other children) be used for surveillance imaging in hydrocephalus at minimum, and ideally in emergency assessments as well when available. In the emergent setting, or when MRI is not available, low-dose non-contrast CT is appropriate.

4 Don't recommend helmets for mild to severe positional flattening.

Positional flattening is very common, affecting up to 40% of infants since the Back to Sleep campaign began in 1992. There is now prospective, randomized control trial evidence that helmeting is no better at improving head shape in mild to severe positional flattening compared with physical therapy and providing general positioning recommendations such as maximizing tummy time while awake, and limiting time in swings and car seats. New guidelines from the Congress of Neurological Surgeons, following a systematic literature review including a review of the randomized trial mentioned above, consider helmeting as an option for severe cases of positional flattening. The prevalence of positional flattening in teens from the era following the Back to Sleep campaign but before helmets were widely used was less than 2%, suggesting that regardless of both the intervention used and the severity of the flattening, the vast majority of cases of positional flattening will cosmetically normalise. The cost of helmeting is also significant; a helmet costs thousands of dollars, and requires frequent adjustments over several months to adjust to an infant's growing head. There are also risks associated with helmeting, including pressure sores and interference with parental attachment. With its associated high cost and only very weak evidence of benefit in treating positional flattening, there is no clear additional value in recommending helmets for infants with mild to severe positional flattening in addition to traditional positioning recommendations and physiotherapy.

5 Don't do routine surveillance imaging for incidentally discovered Chiari I malformation.

Chiari I malformation, defined as cerebellar tonsillar herniation greater than or equal to 5mm below the foramen magnum on MRI brain, is a frequent incidental finding in children, with an estimated prevalence of 1 to 3%. The vast majority of children with incidentally discovered, asymptomatic Chiari I malformations have no clinically significant progression of tonsillar descent on routine follow-up, and symptom development is often unassociated with radiographic change. Radiographic follow-up in the absence of new symptomatology is therefore unnecessary.

How the list was created

The Canadian Pediatric Neurosurgery Study Group (CPNSG)'s membership is composed of pediatric neurosurgeons practicing in Canada. Contact information for the group's members was used to invite pediatric neurosurgeons practicing in Canada to complete two anonymized emailed questionnaires, first to brainstorm recommendations, and then to rate them. Recommendations that had overall support were presented for discussion at the CPNSG annual meeting in 2016. From this list, suggested recommendations were eliminated if they were felt by the study group to not be adequately evidence-based, or if they were felt to not be significantly impactful on a pediatric neurosurgical patient population. A final questionnaire was then sent out to Canadian pediatric neurosurgeons, asking each participant to rank each of the final suggested recommendations. The top five suggested recommendations with the strongest support were then selected as the Choosing Wisely Canada recommendations for pediatric neurosurgery and presented to Choosing Wisely Canada for final approval and endorsement.

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About The Canadian Pediatric Neurosurgery Study Group

The Canadian Pediatric Neurosurgery Study Group (CPNSG) is a proud partner of the Choosing Wisely Canada campaign. The CPNSG is a national collaborative representing all provincial pediatric neurosurgery centres across Canada and is dedicated to optimizing Canadian pediatric neurosurgical patient care through collaborative data collection, clinical research and innovation.

Six Things Physicians and Patients Should Question

1 Don't treat asymptomatic urinary tract infections in catheterized patients.

Urinary tract infections (UTIs) in catheterized patients are considered “complicated UTIs”. However, this term can be misleading and prompt clinicians to over treat infections in this population. It is generally recommended that persons with spinal cord injury (SCI) be treated for bacteriuria only if they have symptoms. Specifically, the 2006 Consortium for Spinal Cord Medicine Guidelines for Healthcare Providers require that the following three criteria be met before an individual with SCI is diagnosed with a UTI: (1) significant bacteriuria, (2) pyuria, and (3) signs and symptoms of a UTI.

2 Don't regularly prescribe bed rest and inactivity following injury and/or illness unless there is scientific evidence that harm will result from activity.

Bed rest is often used to treat a variety of medical conditions. Prolonged bed rest causes major cardiovascular, respiratory, musculoskeletal and neuropsychological changes. Negative effects include thromboembolism, pneumonia, muscle wasting and physical deconditioning. Many of the negative effects begin within days of confinement, but consequences can last much longer. Specifically, in acute DVT/PE, bed rest has no impact on the risk of developing new PE. Furthermore, in acute low back pain, advice to stay active compared to rest in bed showed benefits in pain relief and functional improvement. Therefore, it is important to limit bed rest as much as possible.

3 Don't order prescription drugs for pain without considering functional improvement.

Prescription pain medications have been shown to be effective for pain relief. However, a number of adverse events have been established. While pain reduction is an important outcome measure for patients, they also highly value improved function and quality of life. The addition of prescription pain medications does not always improve functional outcomes, or even pain. There is also a significant risk of long-term addiction. It is imperative that providers work with patients to establish treatment goals, regularly reassess pain and function, and taper or discontinue medications as able or if patients experience harm.

4 Don't order CT scans for low back pain unless red flags are present.

Low back pain is one of the leading causes of disability, with a lifetime prevalence of 40%. Routine imaging for low back pain in the absence of red flag symptoms does not change clinical outcomes including pain, function, quality of life and mental health. Red flags include, but are not limited to, severe or progressive neurological deficits or when serious underlying conditions such as osteomyelitis are suspected. In comparing early versus late imaging for non-specific low back pain, there is no difference between groups in terms of overall treatment plan. Imaging can result in “labeling” of patients, exposure to radiation, and unnecessary invasive procedures.

5 Don't use benzodiazepines for the treatment of agitation in the acute phase of traumatic brain injury after initial stabilization.

After initial stabilization and when intracranial pressure is controlled, the use of benzodiazepines in the acute phase of traumatic brain injury should be limited to specific medical indications, such as alcohol withdrawal. In animal models of acute TBI, benzodiazepines have been associated with slowed or halted recovery. Moreover, benzodiazepines have adverse effects on cognition, and can cause respiratory depression, paradoxical agitation, and anterograde amnesia. Non-pharmacologic interventions are essential components of the management of agitation after TBI. Beta blockers, such as propranolol, are first line pharmacotherapeutic agents, and anticonvulsants can also be used to decrease agitated behaviours.

6 Don't recommend carpal tunnel release without electrodiagnostic studies to confirm the diagnosis and severity of nerve entrapment.

Carpal tunnel release is a highly effective treatment for Carpal Tunnel Syndrome. Clinicians considering referral for surgical management should be aware that good surgical outcome is best correlated with a combination of positive clinical and positive electrodiagnostic studies (EDX). Clinical tests together with EDX have a better association with surgical outcome than either alone. Pre-op nerve conduction study severity can also better predict time to resolution and degree of resolution of symptoms.

How the list was created

The Canadian Association of Physical Medicine and Rehabilitation (CAPM&R) established its Choosing Wisely Canada Top 6 recommendations as a result of a one-year long process. Special Interest Groups (SIGs) were asked to propose relevant items to be considered for Choosing Wisely Canada. As a result, 23 items were refined and distributed to all 385 CAPM&R members for ranking. The CAPM&R executive committee chose a final list of six items from the most highly ranked items on the national survey. At the May 2016 annual CAPM&R meeting, the six items with summary statements and literature reviews were presented to the CAPM&R membership and ultimately approved.

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About The Canadian Association of Physical Medicine and Rehabilitation

The Canadian Association of Physical Medicine and Rehabilitation (CAPM&R) is a proud partner of the Choosing Wisely Canada campaign. The CAPM&R is a member service organization that represents Canadian physiatrists and promotes their pursuit of excellence in the field of physical medicine and rehabilitation. The CAPM&R was founded in 1952 and has over 380 members today.

Thirteen Things Physicians and Patients Should Question

1 **Don't use atypical antipsychotics as a first-line intervention for insomnia in children and youth.**

Recent research confirms a dramatic increase in the use of atypical antipsychotics with subsequent side-effects including obesity, which is already a major health issue. It is prudent to pursue nonpharmacological measures first, such as behavioural modifications and ensuring good sleep hygiene (such as eliminating daytime napping and shutting off electronics an hour before bedtime). If these interventions are not successful, then consider short-term use of melatonin.

2 **Don't use SSRIs as the first-line intervention for mild to moderately depressed teens.**

Evidence clearly indicates that antidepressant medication is less effective in children and adolescents up to the age of 17 years and first-line treatment for this group should include cognitive behavioural therapy or interpersonal psychotherapy. Attention should always be focused on children's and teens' environmental safety and adequate parental support to avoid missing cases of neglect or abuse. Following this, a first-line intervention should be psychoeducation on the importance of regular sleep, diet and exercise to ensure healthy, age-appropriate developmental support.

3 **Don't use atypical antipsychotics as a first-line intervention for Attention Deficit Hyperactivity Disorder (ADHD) with disruptive behaviour disorders.**

Treatment of ADHD should include adequate education of patients and their families, behavioural interventions, psychological treatments and educational accommodations first. If this approach is not sufficient, stimulant medication and a behavioural analysis to ensure appropriate support from the parent and classroom is indicated. The use of alpha 2 agonists (such as guanfacine) and atomoxetine should be considered before using atypical antipsychotics (such as risperidone) in children with disruptive behaviour disorders (oppositional defiant disorder, conduct disorder).

4 **Don't use psychostimulants as a first-line intervention in preschool children with ADHD.**

Preschool children with ADHD need to be assessed for other neurodevelopmental disorders and consideration given to environmental stressors such as neglect, abuse or exposure to domestic violence. Treatment also includes adequate education and support of parents followed by advice on behavioural management and community placement.

5 **Don't routinely use antipsychotics to treat primary insomnia in any age group.**

Second-generation antipsychotics (SGAPs), such as olanzapine and quetiapine, have sedative properties, and are often prescribed off-label for complaints of insomnia. These drugs carry significant risk of potential side-effects including weight gain and metabolic complications, even at low doses used to treat insomnia. In patients with dementia, they can also potentially cause serious side-effects of increased risk of cerebrovascular event and increased risk of death.

6 **Don't routinely order qualitative toxicology (urine drug screen) testing on all psychiatric patients presenting to emergency rooms.**

Qualitative urine toxicology testing has not been shown to improve the routine management of psychiatric patients in emergency rooms because of the potential for false positives, false negatives, true positives which are unrelated or minimally relevant to the clinical presentation, and finally the delay in psychiatric assessment and management as a result of testing.

7 **Don't routinely use antidepressants as first-line treatment for mild or subsyndromal depressive symptoms in adults.**

Antidepressant response rates are higher for depression of a moderate to severe nature. For mild or subsyndromal depressive symptoms a complete assessment, ongoing support and monitoring, psychosocial interventions and lifestyle modifications should be the first lines of treatment. This may avoid the side-effects of medication and establish etiological factors important to future assessment and management. Antidepressants are appropriate in cases of persistent mild depression, where there is a past history of more severe depression, or where other interventions have failed.

8 Don't routinely order brain neuroimaging (CT or MRI) in first episode psychoses in the absence of signs or symptoms suggestive of intracranial pathology.

Signs and symptoms suggestive of intracranial pathology include headaches, nausea and vomiting, seizure-like activity, and later-age of onset of symptoms. Multiple studies have found that routine neuroimaging in first episode psychoses does not yield findings which alter clinical management in a meaningful way. The risks of radiation exposure and delay in treatment also argue against routine neuroimaging.

9 Don't routinely continue benzodiazepines initiated during an acute care hospital admission without a careful review and plan of tapering and discontinuing, ideally prior to hospital discharge.

Benzodiazepines, while helpful for short-term relief of anxiety and insomnia, are associated with a variety of side-effects and long-term problems including cognitive and psychomotor impairment as well as abuse and dependence. Benzodiazepines are commonly used in hospital to treat anxiety or insomnia in association with either the presenting condition or the hospital environment. Once the presenting condition is treated, benzodiazepines should be tapered and discontinued. For patients who are still on benzodiazepines at the time of discharge, a plan for tapering and discontinuing them after discharge should be completed and specified in the discharge summary and prescription.

10 Don't routinely prescribe antidepressants as first-line treatment for depression comorbid with an active alcohol use disorder without first considering the possibility of a period of sobriety and subsequent reassessment for the persistence of depressive symptoms.

The concurrent management of psychiatric illness and alcohol use disorders requires evaluation of the role alcohol plays as a causative factor for depressive symptoms. Studies have found that response rates to antidepressants are higher when antidepressants are reserved for persistence of symptoms after a period of sobriety lasting from two to four weeks. Additionally, studies have demonstrated remission from depressive symptoms with sobriety in the absence of antidepressant treatment in a significant percentage of cases. Management of comorbid psychiatric illness and substance use disorders including alcohol dependence involves assessment and treatment delivered in a concurrent manner.

11 Don't routinely prescribe high-dose or combination antipsychotic treatment strategies in the treatment of schizophrenia.

High-dose and combination strategies involving atypical antipsychotics (AAPs) are used in clinical practice for patients with schizophrenia who are inadequately controlled with one or more AAPs used at standard doses. A recent meta-analysis found no clinically significant improvements in patients with schizophrenia who were inadequately controlled on standard-dose antipsychotics when treated with combination or high-dose AAPs. In terms of safety, no clinically significant differences were evident between combination or high-dose therapy in comparison with standard-dose monotherapy.

12 Don't use antipsychotics as first choice to treat behavioural and psychological symptoms of dementia.

People with dementia often exhibit challenging behavioural symptoms such as aggression and psychosis. In such instances, antipsychotic medicines may be necessary, but should be prescribed cautiously as they provide limited benefit and can cause serious harm, including premature death. Use of these drugs should be limited in dementia to cases where nonpharmacologic measures have failed, and where the symptoms either cause significant suffering, distress, and/or pose an imminent threat to the patient or others. A thorough assessment that includes identifying and addressing causes of behaviour change can make use of these medications unnecessary. Epidemiological studies suggest that typical (i.e., first generation) antipsychotics (i.e., haloperidol) are associated with at least the same risk of adverse events. This recommendation does not apply to the treatment of delirium or major mental illnesses such as mood disorders or schizophrenia.

13 Don't use benzodiazepines or other sedative-hypnotics in older adults as first choice for insomnia.

Nonpharmacological interventions such as cognitive behavioural therapy and brief behavioural interventions have proven benefit in the management of insomnia in older adults. Epidemiological studies have shown that the risk of motor vehicle accidents, falls and hip fractures leading to hospitalization and death can more than double in older adults taking benzodiazepines and other sedative-hypnotics. Prescribing or discontinuing sedative-hypnotics in hospital can have substantial impact on long-term use. These potential harms and others such as impaired cognition need to be recognized when considering treatment strategies for insomnia. Use of benzodiazepines should be limited to as short a period as possible, in cases where nonpharmacological therapies have failed, and the symptoms of sleep disturbance cause significant suffering or distress.

How the list was created

The Canadian Psychiatric Association (CPA) determined its *Choosing Wisely Canada* recommendations by establishing a working group that included representatives from the CPA's Professional Standards and Practice Committee, Research Committee, and Member-in-Training Section, as well as the Canadian Academy of Geriatric Psychiatry (CAGP) and the Canadian Academy of Child and Adolescent Psychiatry (CACAP). A person with lived experience from the Canadian Mental Health Association was also a member of the working group. CPA members were invited to provide suggestions for potential list items, as were the provincial psychiatric associations, the Canadian Academy of Psychiatry and the Law (CAPL) and the Canadian Academy of Psychosomatic Medicine (CAPM). The working group considered suggestions received, and assistance was obtained from the Addiction and Mental Health Strategic Clinical Network for Alberta Health Services in conducting rapid literature reviews on a number of potential CPA list items. List items were further refined in subsequent working group teleconferences, and a next-to-final draft was recirculated to the provincial psychiatric associations, CAPL and CAPM for final comments, which were considered by the working group in preparing its final list.

A small subcommittee of the CAGP was organized, with input from representatives from the CAPM and the Canadian Geriatrics Society (CGS). The group reviewed the recommendations made by members of a CPA membership survey, as well as the CGS, AGS and the American Psychiatric Association's (APA) recommendations for *Choosing Wisely*. Two recommendations were selected and discussed, and minor revisions were made to the paragraphs underneath the recommendations. The CAGP also focused the recommendation about benzodiazepines and other hypnotics on insomnia, rather than on a variety of conditions.

The Executive Committee of the Canadian Academy of Child and Adolescent Psychiatry (CACAP) developed a draft list of items after reviewing recommendations made by members of a CPA membership survey, as well as the American Psychiatric Association's (APA) recommendations for *Choosing Wisely*. The list was further discussed and refined and additional feedback was obtained from the CACAP Board of Directors, as well as the Section of Child and Adolescent Psychiatry of the Alberta Psychiatric Association and colleagues elsewhere in the country.

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The Canadian Psychiatric Association (CPA) is a proud partner of the *Choosing Wisely Canada* campaign. CPA is the national voluntary professional association for Canada's 4,700 psychiatrists and 900 residents. As the national voice of Canada's psychiatrists, the CPA advocates for the professional needs of its members in meeting the mental health needs of Canadians, and promotes excellence in education, research and clinical practice. Its mission is to provide a strong, collective voice for psychiatrists across the country and to foster a community dedicated to ensuring the highest possible standards of professional practice in providing psychiatric services to Canadians.

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The Canadian Academy of Child Psychiatry (CACAP) is a proud partner of the *Choosing Wisely Canada* campaign. CACAP promotes quality care and service to the children, youth and families of Canadians within an approach that includes the biological, the psychological and the social; that works with other professional disciplines; and across many sectors of health and other related service organizations.

About The Canadian Academy of Geriatric Psychiatry

The Canadian Academy of Geriatric Psychiatry (CAGP) is a proud partner of the *Choosing Wisely Canada* campaign. CAGP is a national organization of psychiatrists dedicated to promoting mental health in the Canadian elderly population through the clinical, educational, research and advocacy activities of its membership. It was founded in 1991, and is recognized as the voice of Geriatric Psychiatry in Canada. The CAGP is a member of the Council of Academies of the Canadian Psychiatric Association. There are over 300 current members.



Five Things Physicians and Patients Should Question

1 Don't do imaging for lower-back pain unless red flags are present.

Red flags include suspected epidural abscess or hematoma presenting with acute pain, but no neurological symptoms (urgent imaging is required); suspected cancer; suspected infection; cauda equina syndrome; severe or progressive neurologic deficit; and suspected compression fracture. In patients with suspected uncomplicated herniated disc or spinal stenosis, imaging is only indicated after at least a six-week trial of conservative management and if symptoms are severe enough that surgery is being considered.

2 Don't do imaging for minor head trauma unless red flags are present.

Red flags include Glasgow Coma Scale (GCS) less than 13; GCS less than 15 at 2 hours post-injury; a patient aged 65 years or older; obvious open skull fracture; suspected open or depressed skull fracture; any sign of basilar skull fracture (e.g., hemotympanum, raccoon eyes, Battle's Sign, CSF otorrhorrhea); retrograde amnesia to the event lasting 30 minutes or longer after the event; "dangerous" mechanism (e.g., pedestrian struck by motor vehicle, occupant ejected from motor vehicle, or fall from higher than 3 feet or down more than 5 stairs); and coumadin-use or bleeding disorder.

3 Don't do imaging for uncomplicated headache unless red flags are present.

Red flags include recent onset, rapidly increasing frequency and severity of headache; headache causing the patient to wake from sleep; associated dizziness, lack of coordination, tingling or numbness, new neurologic deficit; and new onset of a headache in a patient with a history of cancer or immunodeficiency.

4 Don't do computed tomography (CT) for the evaluation of suspected appendicitis in children until after ultrasound has been considered as an option.

Although CT is accurate in the evaluation of suspected appendicitis in the pediatric population, ultrasound is nearly as good in experienced hands. Since ultrasound will reduce radiation exposure, ultrasound is the preferred initial imaging examination in children. If the results of the ultrasound exam are equivocal, it may be followed by CT. This approach is cost-effective, reduces potential radiation risks and has excellent accuracy, with reported sensitivity and specificity of 94 percent.

5 Don't do an ankle X-ray series in adults for minor injuries.

X-rays are only indicated if there is pain in the malleolar zone, bone tenderness at the posterior edge or tip of either malleolus, or inability to bear weight for four steps immediately after the trauma and in the emergency department.

How the list was created

The Canadian Association of Radiologists (CAR) established its *Choosing Wisely Canada* Top 5 recommendations by initially soliciting expert opinion from physician leaders within its Board of Directors. A working group was then formed to further identify common clinical scenarios in which imaging may be misused and should be reconsidered. The working group included CAR leaders in the areas of medical imaging appropriateness and access. The list was narrowed down based on the highest potential for improvement, representing a broad range of tests and the availability of strong guidelines. The first three recommendations had previously been researched, submitted and adopted for another appropriateness initiative underway in Canada in 2013. That process included obtaining stakeholder support from a range of colleagues including technologists, sonographers, nuclear medicine physicians, family physicians and physicists. Two additional recommendations were added using similar criteria, including a comprehensive literature search undertaken through the Canadian Agency for Drugs and Technologies in Health. The full list of proposed recommendations was then vetted by stakeholder organizations, such as provincial radiology organizations and the full CAR membership. Item 4 was adapted with permission from the *Five Things Physicians and Patients Should Question*. © 2012 American College of Radiology

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About Choosing Wisely Canada

Choosing Wisely Canada is a campaign to help physicians and patients engage in conversations about unnecessary tests, treatments and procedures, and to help physicians and patients make smart and effective choices to ensure high-quality care.

For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Association of Radiologists

The Canadian Association of Radiologists (CAR) is a proud partner of the *Choosing Wisely Canada* campaign. The CAR is the national specialty society for radiologists in Canada, committed to promoting the highest standards in patient-centered imaging, lifelong learning and research. As the national voice of radiology, the CAR works on behalf of the more than 2,500 radiologists and radiologists in training in Canada.



Six Things Physicians and Patients Should Question

1 Don't initiate long-term maintenance inhalers in stable patients with suspected COPD if they have not had confirmation of post-bronchodilator airflow obstruction with spirometry.

A diagnosis of COPD should be considered in any patient who has dyspnea, chronic cough, and/or sputum production and an appropriate history of exposure to noxious stimuli. However, not all patients with these symptoms have COPD, and a spirometry demonstrating a post-bronchodilator forced expiratory volume in one second to forced vital capacity (FEV1/FVC) ratio < 70% (or less than the lower limit of normal, if available) is required to make a definitive diagnosis. Starting maintenance inhalers without first objectively diagnosing COPD results in unnecessary treatment in those patients who do not actually have the disease. In turn, this exposes these patients to both the side-effects and the cost of these medications, and might delay the appropriate diagnosis.

2 Don't perform CT screening for lung cancer among patients at low risk for lung cancer.

CT scan screening has no proven benefit in patients who are not at high risk for lung cancer, regardless of age, smoking history or other risk factors. Low dose chest CT screening has been found to reduce lung cancer mortality in a well-defined population of patients at high risk for lung cancer, defined by age 55-74, at least a 30-pack year history of tobacco use, and smoking within the last 15 years. However, screening is also associated with several harms, including false-negative and false-positive results, incidental findings, overdiagnosis (detecting indolent and clinically insignificant tumors that would not have been detected in the patient's lifetime without screening), and cumulative exposure to radiation (which can cause cancer). Screening also leads to unnecessary anxiety and invasive procedures, which carry their own complications. Accordingly, it should not be used in patients who do not meet these strict criteria, nor in patients with a health problem that substantially limits life expectancy or the ability or willingness to have curative therapy.

3 Don't perform chest computed tomography (CT angiography) or ventilation-perfusion scanning to evaluate for possible pulmonary embolism in patients with a low clinical probability and negative results of a highly sensitive D-dimer assay.

The majority of adults with chest pain and/or dyspnea do not have a pulmonary embolism (PE). There is strong evidence that in patients with low pre-test probability as determined by a clinical prediction rule (e.g., Wells score), a negative highly sensitive D-dimer assay effectively excludes clinically important PE. Furthermore, there are potential harms to performing CT pulmonary angiography (CTPA) or ventilation-perfusion (V/Q) scanning, including exposure to ionizing radiation, adverse events due to the administration of intravenous contrast, and identification of clinically insignificant PE leading to inappropriate anticoagulation. However, physicians should exercise clinical judgement in populations in whom this two-step algorithm has not been validated (e.g., pregnant patients).

4 Don't treat adult cough with antibiotics even if it lasts more than 1 week, unless bacterial pneumonia is suspected (mean viral cough duration is 18 days).

The majority of adults with a short duration of cough from an acute respiratory tract infection have a viral rather than a bacterial infection. Patients often underestimate the typical cough duration from an infectious illness, and when cough does not resolve within their expected time frame, may request antibiotics. The average duration of cough (not treated with antibiotics) is around 18 days, though patients only expect to cough for 5 to 7 days. Use of immediate or delayed antibiotics does not change clinical outcomes compared to no antibiotics in these situations. On the other hand, the harms of over-prescribing antibiotics include medication costs, adverse reactions, and the possibility of inducing bacterial resistance to antibiotics. Physicians should educate patients about the expected duration of cough and the consequences of inappropriate antibiotic use in acute respiratory tract infections.

5 Don't initiate medications for asthma (e.g., inhalers, leukotriene receptor antagonists, or other) in patients ≥ 6 years old who have not had confirmation of reversible airflow limitation with spirometry, and in its absence, a positive methacholine or exercise challenge test, or sufficient peak expiratory flow variability.

Although international guidelines uniformly recommend objective testing to establish an asthma diagnosis, this diagnosis is often made clinically and asthma medications are often initiated on that clinical basis. However, physical exam findings and symptoms such as cough, wheeze, and/or dyspnea can be caused by other conditions. As a result, up to one third of patients who have been diagnosed with asthma do not have evidence of asthma when objectively tested with pulmonary function tests. A false clinical diagnosis of asthma may delay diagnosis of the actual underlying condition, which may include serious cardiorespiratory conditions. Furthermore, patients with a false diagnosis of asthma who are started on asthma medications are unnecessarily exposed to both the side-effects and the costs of these medications. It should be noted, however, that this recommendation may not be applicable in patients who cannot reproducibly undergo objective testing for asthma (including children less than 6 years old), and in settings where such testing is not available.

6 Don't use antibiotics for acute asthma exacerbations without clear signs of bacterial infection.

Asthma exacerbations are characterized by decreased expiratory airflow as well as increased shortness of breath, cough, wheezing, chest tightness, or a combination of these symptoms. When such an attack is precipitated by an infection, it is much more likely to be viral than bacterial. The role of bacterial infection is often overestimated; however antibiotics should be reserved for relatively rare cases in which there is strong evidence of a bacterial infection, such as pneumonia or bacterial sinusitis. Potential harms of unnecessary antibiotic treatment include medication costs, side-effects (including a risk of allergy), and emergence of bacterial resistance.

How the list was created

The Choosing Wisely Canada top six list in respiratory medicine was developed by the Canadian Thoracic Society (CTS) through an iterative consultation process with CTS content experts and its members. A list of candidate recommendations was developed through: 1) consultation with the CTS Choosing Wisely Core Task Force (5 members), all CTS guideline writers, and the CTS Executive Committee; 2) retrieving respiratory-related choosing wisely recommendations in existing US and Canadian lists; and 3) selecting all Canadian Medical Association (CMA) POEMs™ (Patient-Oriented Evidence that Matters) between 2012-2015 that were considered to “help to avoid unnecessary or inappropriate treatment, diagnostic procedures, preventative interventions or a referral” by $\geq 10\%$ of readers [in the Information Assessment Method (IAM) rating tool]. The CTS Choosing Wisely Task Force (comprised of the CTS Choosing Wisely Core Task Force and the CTS Canadian Respiratory Guidelines Committee; 19 members) then selected and prioritized 20 of these recommendations based on pre-established criteria, through an electronic Delphi process. These 20 recommendations were then sent to the entire CTS membership for selection and prioritization of the top 10 recommendations, along with a solicitation for new ideas. A second electronic Delphi process with the CTS Choosing Wisely Task Force narrowed this list to a final top 10. The CTS Choosing Wisely Core Task Force then performed a narrative literature review for each of these recommendations, focusing on similar prior Choosing Wisely recommendations, guideline recommendations, systematic reviews, and individual studies. The results of this review were presented to the CTS Choosing Wisely Task Force in a 3rd electronic Delphi process, in which they were asked to select and prioritize the top 5 recommendations. Given that scores between the 5th and 6th rated recommendations were close, 6 recommendations were adopted. These recommendations were approved by the CTS Executive Committee and will be broadly disseminated to our membership, other professional groups, and the general public.

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About Choosing Wisely Canada

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About the Canadian Thoracic Society

The Canadian Thoracic Society (CTS) is a proud partner of the Choosing Wisely Canada campaign. CTS is Canada's national specialty society for respirology bringing together over 1,000 members representing specialists, physicians and researchers as well as healthcare professionals from a variety of disciplines working in respiratory health.

Five Things Physicians and Patients Should Question

1 Don't order ANA as a screening test in patients without specific signs or symptoms of systemic lupus erythematosus (SLE) or another connective tissue disease (CTD).

ANA testing should not be used to screen subjects without specific symptoms (e.g., photosensitivity, malar rash, symmetrical polyarthritis, etc.) or without a clinical evaluation that may lead to a presumptive diagnosis of SLE or other CTD, since ANA reactivity is present in many non-rheumatic conditions and even in "healthy" control subjects (up to 20%). In a patient with low pre-test probability for ANA-associated rheumatic disease, positive ANA results can be misleading and may precipitate further unnecessary testing, erroneous diagnosis or even inappropriate therapy.

2 Don't order an HLA-B27 unless spondyloarthritis is suspected based on specific signs or symptoms.

HLA-B27 testing is not useful as a single diagnostic test in a patient with low back pain without further spondyloarthropathy (SpA) signs or symptoms (e.g., inflammatory back pain ≥ 3 months duration with age of onset < 45 years, peripheral synovitis, enthesitis, dactylitis, psoriasis or uveitis) because the diagnosis of spondyloarthropathy in these patients is of low probability. If HLA-B27 is used, at least two SpA signs or symptoms, or the presence of positive imaging findings, need to be present to classify a patient as having axial SpA. There is no clinical utility to ordering an HLA-B27 in the absence of positive imaging or the minimally required SpA signs or symptoms.

3 Don't repeat dual energy X-ray absorptiometry (DEXA) scans more often than every 2 years.

The use of repeat DEXA scans at intervals of every 2 years is appropriate in most clinical settings, and is supported by several current osteoporosis guidelines. Because of limitations in the precision of testing, a minimum of 2 years may be needed to reliably measure a change in BMD. If bone mineral densities are stable and/or individuals are at low risk of fracture, then less frequent monitoring up to an interval of 5-10 years can be considered. Shorter or longer intervals between repeat DEXA scans may be appropriate based on expected rate of change in bone mineral density and fracture risk.

4 Don't prescribe bisphosphonates for patients at low risk of fracture.

There is no convincing evidence that anti-osteoporotic therapy in patients with osteopenia alone reduces fracture risk. The 2008 Cochrane Reviews for three bisphosphonates (Alendronate, Etidronate, Risedronate) found no statistically significant reductions for primary prevention of fracture in postmenopausal women. Fracture risk is determined using either the Canadian Association of Radiologists and Osteoporosis Canada risk assessment tool (CAROC) or FRAX®, a World Health Organization fracture risk assessment tool. Both are available as online calculators of fracture risk. Given the lack of proven efficacy, widespread use of bisphosphonates in patients at low risk of fracture is not currently recommended.

5 Don't perform whole body bone scans (e.g., scintigraphy) for diagnostic screening for peripheral and axial arthritis in adults.

The diagnosis of peripheral and axial inflammatory arthritis can usually be made on the basis of an appropriate history, physical exam and basic investigations. Whole body bone scans, such as the Tc-99m MDP scintigraphy, lack specificity to diagnose inflammatory polyarthritis or spondyloarthritis and have limited clinical utility. This approach is cost-effective and reduces radiation exposure.

How the list was created

The Canadian Rheumatology Association (CRA) established its *Choosing Wisely Canada* Top 5 recommendations using a multistage process combining consensus methodology and literature reviews. A steering committee solicited a group of practicing rheumatologists from across the country from diverse clinical settings and an allied health professional to form the CRA *Choosing Wisely Canada* committee. This group generated candidate recommendations using the Delphi method. Recommendations with high content agreement and perceived prevalence advanced to a survey of CRA members. CRA members ranked these top items based on content agreement, impact and item ranking. A methodology subcommittee discussed the items in light of their relevance to rheumatology, potential impact on patients and the member survey results. The Top 5 candidate items were selected to advance for literature review. The list was approved by the CRA Board of Directors and has been reviewed by a group of patient collaborators with rheumatic diseases. Patient collaborators also worked with the CRA to ensure the CRA *Choosing Wisely Canada* statements were translated into lay-language and made accessible to patients and the public.

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About The Canadian Rheumatology Association

The Canadian Rheumatology Association (CRA) is a proud partner of the *Choosing Wisely Canada* campaign. Made up of over 500 members, including just over 400 rheumatologists, the mission of the CRA is to promote the pursuit of excellence in arthritis care, education and research. The CRA strives to provide the best services and support to its membership to provide the best quality of care possible to patients. This includes an amazing lineup of topics and speakers for the Annual Scientific Meeting, a website full of information, programs to attract more medical students into rheumatology, awards to recognize its members, guidelines development, research funding opportunities and excellent working partnerships with other organizations.

Five Things Physicians and Patients Should Question

1 **Don't perform fusion surgery to treat patients with mechanical axial low back pain from multilevel spine degeneration in the absence of:**

- **leg pain with or without neurologic symptoms and/or signs of concordant neurologic compression**
- **structural pathology such as spondylolisthesis or deformity.**

For over half a century back pain has been the most common reason for spinal fusion. Yet there is no unequivocal evidence that fusion is superior to comprehensive conservative treatment for treating back pain without focal structural pathology and concordant mechanical or neurological symptoms. It is often impossible to locate the precise source of the pain; in many cases the symptoms are multifactorial and can encompass elements such as centralized pain that exist outside the spine. The extreme heterogeneity of the low back pain population leads to unpredictable surgical results and consistently poor outcomes in those with pain from multilevel spine degeneration.

2 **Don't routinely image patients with low back pain regardless of the duration of symptoms unless:**

- **there are clinical reasons to suspect serious underlying pathology (i.e., red flags)**
- **imaging is necessary for the planning and/or execution of a particular evidenced-based therapeutic intervention on a specific spinal condition.**

Unless the image has a direct bearing on the treatment decision it is not required. Spinal "abnormalities" in asymptomatic individuals are common and increase with age. For those with back dominant symptoms (i.e., axial back pain) there is an extremely high false positive rate; most of the findings have no correlation with the clinical picture. For the majority of low back complaints obtaining spinal imaging does not improve patient care but can lead to inappropriate interventions and does have a detrimental impact on patient outcomes. Red flags include cauda equina syndrome; severe or progressive neurologic deficits; suspected cancer; suspected infection; suspected fracture and suspected epidural abscess or hematoma.

3 **Don't use epidural steroid injections (ESI) for patients with axial low back pain who do not have leg dominant symptoms originating in the nerve roots.**

Steroids are potent anti-inflammatory agents, but axial low back pain is not primarily an inflammatory condition and any inflammation that does exist generally cannot be accessed via the spinal canal. The outcomes of ESI for axial low back pain are poor compared to its use in radiculopathy due to disc herniation. Although serious adverse events are rare, catastrophic events can occur and any symptom relief from the injection typically lasts only for a matter of weeks. The inconsequential benefits of ESI for axial low back pain do not outweigh its risks, no matter how small they may be.

4 **Don't miss the opportunity to brace the skeletally immature patient with adolescent idiopathic scoliosis (AIS) who has more than one year of growth remaining and a curve magnitude greater than 20 degrees.**

Significant controversy still exists regarding the use of bracing in AIS patients at risk for curve progression and eventual surgery. A recent high-level study has convincingly shown that bracing impacts the natural history of AIS and, in those properly braced, significantly reduces the need for a subsequent operation. In light of the resulting decrease in the indications for surgical intervention, the bias against bracing should be reevaluated.

5 **Don't order peri-operative antibiotics beyond a 24-hour post-operative period for non-complicated instrumented cases in patients who are not at high risk for infection or wound contamination. Administration of a single pre-operative dose for spine cases without instrumentation is adequate.**

Although a deep surgical site infection associated with spinal implants can be a devastating adverse event, the prolonged use of peri-operative antibiotics has not been shown to reduce the incidence. Their extended use in routine low risk cases has no proven evidence of benefit but increases the chance of creating resistant bacterial strains. A rational, evidence-based approach is required.

How the list was created

The Canadian Spine Society (CSS) established its *Choosing Wisely Canada* Top 5 recommendations by compiling a committee of experts who took suggestions from the general membership and created a seven item preliminary statement. This was circulated to all the CSS members by email and they were asked to vote their order of preference and suggestions for wording as well as to add any topic they believed should be included. The amended list was recirculated, revised and sent to the membership for a third time. This list is the final agreed result.

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About The Canadian Spine Society

The Canadian Spine Society (CSS) is a proud partner of the *Choosing Wisely Canada* campaign. The CSS is a collaborative body of Canadian Neurosurgical and orthopaedic spine surgeons and other spine care professionals with a primary interest in advancing excellence in spine patient care, research and education. The CSS serves as the umbrella group for the leading spine-related organizations across Canada and maintains strong partnerships with The Rick Hansen Institute and major Canadian universities.

Five Things Physicians and Patients Should Question

1 **Don't order an MRI for suspected degenerative meniscal tears or osteoarthritis (OA).**

Degenerate meniscal tears and osteoarthritis (OA) are extremely common in the general population. Early degenerative changes in the meniscus can be found in many subjects under the age of 30. By 50 to 60 years of age, full degenerative meniscal tears are commonly found in 33-50% of subjects. Unless associated with the presence of osteoarthritis (OA), these degenerative meniscal tears are most often asymptomatic. Magnetic resonance imaging (MRI) is not recommended for degenerative meniscal tears unless there are mechanical symptoms (e.g., locking) or lack of improvement with conservative treatment (exercise/therapy, weight loss, bracing, topical or oral analgesia, intra-articular injections). MRI is not recommended for the diagnosis or management of OA. Weight-bearing X-rays should be ordered instead.

2 **Don't prescribe opiates as first line treatment for tendinopathies.**

Tendinopathy is a broad term encompassing painful conditions occurring in and around tendons in response to overuse. Although acute inflammatory tendinopathies (i.e., tendinitis) exist, most patients seen in primary care will have chronic symptoms (tendinosis). Multimodality options (e.g., relative rest, activity modifications, physical or athletic therapy, etc.) should be considered as the first line treatment of tendinopathies. Opiates should not be used in the initial phase of treatment.

3 **Don't order orthotics for asymptomatic children with pes planus (flat feet).**

Pes planus is common in children. Although it rarely leads to disability, it is still a major concern for parents and is a common cause of clinic visits for pediatric foot problems. Most pediatric pes planus cases are characterized by a normal arch during non-weight bearing, and a flattening of the arch on standing. They are often painless, non-problematic, and resolve by adolescence. The current evidence suggests that it is safe and appropriate to simply observe an asymptomatic child with flexible pes planus.

4 **Don't order an MRI as an initial investigation for suspected rotator cuff tendinopathy.**

Initial management of rotator cuff tendinopathy includes relative rest, modification of painful activities, and an exercise program guided by a physical therapist or athletic therapist to regain motion and strength. The addition of subacromial cortisone/local anesthetic injections may be helpful. Should conservative management fail to relieve pain and restore function of the shoulder, consider plain radiographs to rule out bony or joint pathology, and ultrasound to assess for rotator cuff and bursal pathology. MRI or MRA (MR arthrogram) should be considered if symptoms don't resolve with conservative therapy and there is a concern of labral pathology.

5 **Don't immobilize ankle inversion sprains with no evidence of bony or syndesmotic injury.**

Ankle sprains are among the most common injuries seen in the ER or physician clinics. Ankle sprains cause a high incidence of absenteeism in professional and physical activities with important economic consequences. There is good evidence to show that functional bracing of the ankle instead of rigid immobilization is associated with improved and earlier functional improvement and an overall shorter recovery period. For ankle inversion sprains with no associated bony or syndesmotic injury, early mobilization using a functional ankle brace and physiotherapy/athletic therapy should be considered instead of rigid immobilization.

How the list was created

The Canadian Academy of Sport and Exercise Medicine (CASEM) Board approved the development of Choosing Wisely Canada's recommendations. A small working group was created to review existing Choosing Wisely Canada recommendations. The CASEM Board then created a list of suggested recommendations based on existing research, experience and common practice patterns. A national survey was conducted with CASEM's membership, soliciting members' feedback for each recommendation. The five recommendations with near unanimous support were selected to be included in CASEM's Choosing Wisely Canada's Top 5 List. Each recommendation was further developed by the small working group, and submitted to CASEM's publication's committee for review and feedback. Final edits were made and approved for submission to Choosing Wisely Canada by the CASEM Board.

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About The Canadian Academy of Sport and Exercise Medicine

The Canadian Academy of Sport and Exercise Medicine (CASEM) is a proud partner of the Choosing Wisely Canada campaign. CASEM is an organization of physicians committed to excellence in the practice of medicine as it applies to all aspects of physical activity. CASEM's mission is to forge a strong, collective voice for sport and exercise medicine; to be a leader in advancing the art and science of sport and exercise medicine, including health promotion and disease prevention, for the benefit of all Canadians.

Ten Things Physicians and Patients Should Question

1 Don't transfuse blood if other non-transfusion therapies or observation would be just as effective.

Blood transfusion should not be given if other safer non-transfusion alternatives are available. For example, patients with iron deficiency without hemodynamic instability should be given iron therapy.

2 Don't transfuse more than one Red cell unit at a time when transfusion is required in stable, non-bleeding patients.

Indications for red blood transfusion depend on clinical assessment and the cause of the anemia. In a stable, non-bleeding patient, often a single unit of blood is adequate to relieve patient symptoms or to raise the hemoglobin to an acceptable level. Transfusions are associated with increased morbidity and mortality in high-risk hospitalized inpatients. Transfusion decisions should be influenced by symptoms and hemoglobin concentration. Single unit red cell transfusions should be the standard for non-bleeding, hospitalized patients. Additional units should only be prescribed after re-assessment of the patient and their hemoglobin value.

3 Don't transfuse plasma to correct a mildly elevated (<1.8) international normalized ratio (INR) or activated partial thromboplastin time (aPTT) before a procedure.

A mildly elevated INR is not predictive of an increased risk of bleeding. Furthermore, transfusion of plasma has not been demonstrated to significantly change the INR value when the INR was only minimally elevated (<1.8).

4 Don't routinely transfuse platelets for patients with chemotherapy-induced thrombocytopenia if the platelet count is greater than $10 \times 10^9/L$ in the absence of bleeding.

A platelet count of $10 \times 10^9/L$ or greater usually provides adequate hemostasis. Platelet transfusions are associated with adverse events and risks. Considerations in the decision to transfuse platelets include the cause of the thrombocytopenia, comorbid conditions, symptoms of bleeding, risk factors for bleeding, and the need to perform an invasive procedure.

5 Don't routinely use plasma or prothrombin complex concentrates for non-emergent reversal of vitamin K antagonists.

Patients requiring non-emergent reversal of warfarin can often be treated with vitamin K or by discontinuing the warfarin therapy. Prothrombin complex concentrates should only be used for patients with serious bleeding or for those who need urgent surgery. Plasma should only be used in this setting if prothrombin complex concentrates are not available or are contraindicated.

6 Don't use immunoglobulin therapy for recurrent infections unless impaired antibody responses to vaccines are demonstrated.

Immunoglobulin (gammaglobulin) replacement does not improve outcomes unless there is impairment of antigen-specific IgG antibody responses to vaccine immunizations or natural infections. Isolated decreases in immunoglobulins (isotypes or subclasses), alone, do not indicate a need for immunoglobulin replacement therapy. Exceptions include genetically defined/suspected disorders. Measurement of IgG subclasses is not routinely useful in determining the need for immunoglobulin therapy. Selective IgA deficiency is not an indication for administration of immunoglobulin.

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

Pre-operative transfusion testing is not necessary for the vast majority of surgical patients (e.g., appendectomy, cholecystectomy, hysterectomy and hernia repair) as those patients usually do not require transfusion. Ordering pre-transfusion testing for patients who will likely not require transfusion will lead to unnecessary blood drawn from a patient and unnecessary testing performed. It may also lead to unnecessary delay in the surgical procedure waiting for the results. To guide you whether pre-transfusion testing is required for a certain surgical procedure, your hospital may have a maximum surgical blood ordering schedule or specific testing guidelines based on current surgical practices.

8 Don't routinely order perioperative autologous and directed blood collection.

There is no role for routine perioperative autologous donation or directed donation except for selected patients (for example, patients with rare red blood cell antigen types). Medical evidence does not support the concept that autologous (blood donated by one's self) or directed blood (blood donated by a friend/family member) is safer than allogeneic blood. In fact, there is concern that the risks of directed donation may be greater (higher rates of positive test results for infectious diseases). Autologous transfusion has risks of bacterial contamination and clerical errors (wrong unit/patient transfused). As well, autologous blood donation before surgery can contribute to perioperative anemia and a greater need for transfusion.

9 Don't transfuse O negative blood except to O negative patients and in emergencies for female patients of child-bearing potential of unknown blood group.

Males and females without childbearing potential can receive O Rh-positive red cells. O-negative red cell units are in chronic short supply, in some part due to over utilization for patients who are not O-negative. To ensure O-negative red cells are available for patients who truly need them, their use should be restricted to: (1) patients who are O-Rh-negative; (2) patients with unknown blood group requiring emergent transfusion who are female and of child-bearing age. Type specific red cells should be administered as soon as possible in all emergency situations.

10 Don't transfuse group AB plasma to non-group AB patients unless in emergency situations where the ABO group is unknown.

The demand for AB plasma has increased. Group AB individuals comprise only 3% of Canadian blood donors. Those donors who are group AB are universal donors for plasma, thus are the most in-demand type for plasma transfusion. Type-specific plasma should be issued as soon as possible in emergency situations to preserve the AB plasma inventory for those patients where the blood group is unknown.

How the list was created

The Canadian Society for Transfusion Medicine (CSTM) compiled its *Choosing Wisely Canada* list of recommendations by putting out a call to its membership for suggested list items. Members were asked to provide suggestions, rationale and references. Once all suggestions for list items had been received and the deadline for submissions had passed, the CSTM board voted on the accumulated list and ranked the items according to our assessment of what was most important. We met by conference call to discuss the outcome of the voting and worked together to refine the wording and the order of the list items and to find additional references as required.

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About Choosing Wisely Canada

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For more information on *Choosing Wisely Canada* or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwiselycanada.org. Join the conversation on Twitter @ChooseWiselyCA.

About The Canadian Society for Transfusion Medicine

The Canadian Society for Transfusion Medicine (CSTM) is a proud partner of the *Choosing Wisely Canada* campaign. The CSTM is a multidisciplinary society which promotes and supports best practice in Transfusion Medicine in Canada through education, communication and partnerships.



Five Things Physicians and Patients Should Question

1 Don't order a routine bone scan and CT scan of the pelvis in men with low-risk prostate cancer.

Low-risk patients (defined by D'Amico criteria and National Comprehensive Cancer Network guidelines) are unlikely to have metastatic disease. Accordingly, imaging is generally unnecessary in patients with newly diagnosed prostate cancer who have a PSA <20.0 ng/mL and a Gleason score 6 or less unless the patient's history or clinical examination suggests distant disease. Metastases are much more likely in high-grade disease that is characterized by fast and aggressive growth into surrounding areas such as bones or lymph nodes.

2 Don't order serum testosterone in men without symptoms of hypogonadism.

In the evaluation of men with erectile dysfunction, testosterone should only be ordered if there are signs and/or symptoms of hypogonadism.

3 Don't prescribe testosterone to men with erectile dysfunction who have normal testosterone levels.

While testosterone treatment may increase sexual interest, there appears to be no significant influence on erectile function in men with normal testosterone levels.

4 Don't use antimicrobials to treat asymptomatic bacteriuria in the elderly.

Studies suggest that asymptomatic bacteriuria in the elderly does not carry significant risk of morbidity if left untreated. Antimicrobial treatment studies for asymptomatic bacteriuria in older adults demonstrate no benefits and show increased adverse antimicrobial effects. Consensus criteria has been developed to characterize the specific clinical symptoms that, when associated with bacteriuria, define urinary tract infection. Screening for and treatment of asymptomatic bacteriuria is recommended before urologic procedures for which mucosal bleeding is anticipated.

5 Don't perform ultrasound on boys with cryptorchidism.

Ultrasound is of minimal value in localizing the position or existence of testes that cannot be felt through physical examination. Studies have shown that there remained a significant chance that testes were present even after a negative ultrasound result. The likelihood of locating testes is low when using ultrasound.

How the list was created

The Canadian Urological Association (CUA) utilized its guidelines committee to review evidence from the association's guidelines and the suggestions put forward by the American Urological Association (AUA) to identify potential topics for nomination to the CUA's *Choosing Wisely Canada* list. The general membership had the opportunity to put forward suggestions after being notified of the process via email. The committee reviewed a number of recommendations and through a consensus process identified the five tests or procedures that should be questioned. These recommendations were reviewed and approved by the CUA guidelines committee. Recommendations 1, 3 and 5 were adopted with permission from the Five Things Physicians and Patients Should Question. © 2013 American Urological Association. Recommendation 4 was adopted with permission from the American Geriatrics Society's, "Ten Things Physicians and Patients Should Question"©; The American Geriatrics Society, New York, New York. Reprinted with permission. www.americangeriatrics.org.

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About The Canadian Urological Association

The Canadian Urological Association (CUA) is a proud partner of the *Choosing Wisely Canada* campaign. CUA represents and provides a voice for all Canadian urologists and fosters dedication of all members of the profession toward ensuring the highest possible standard of urologic care of Canadians.

Five Things Physicians and Patients Should Question

1 Don't perform percutaneous interventions or bypass surgery as first line therapy in patients with asymptomatic peripheral arterial disease (PAD) and in most patients with claudication.

PAD is a marker of a systemic disease and patients with PAD may have atherosclerotic disease in other vascular beds, including the carotid and coronary circulation. Patients with mild to moderate PAD have a higher 5 year risk of stroke, myocardial infarction or cardiovascular death than amputation. Initial therapy should include smoking cessation and risk factor modification, medical therapy and a walking program. Lower extremity bypass surgery and endovascular therapy should be reserved for patients with limb threatening ischemia or truly disabling claudication.

2 Don't perform carotid endarterectomies or stenting in most asymptomatic high risk patients with limited life expectancy.

The purpose of carotid artery surgery and stenting is to prevent stroke and, when combined with appropriate medical therapy, is a successful strategy in selected, mainly symptomatic, patients. Medical therapy alone is an effective alternative in many asymptomatic patients and safer in those who are elderly or at high risk for surgery and stenting and don't have the life expectancy to benefit from such a prophylactic procedure.

3 Don't perform open or endovascular repair in most asymptomatic patients with small abdominal aortic aneurysms (<5cm in women, <5.5cm in men).

Repair of asymptomatic abdominal aortic aneurysms is recommended when the risk of rupture exceeds the risk of repair. Randomized controlled trials have failed to show a survival benefit for open or endovascular repair of most small aneurysms. Repair may be considered with specific growth patterns and aneurysm morphology.

4 Don't perform endovascular repair of abdominal aortic aneurysms in most asymptomatic high-risk patients with limited life expectancy.

Repair of asymptomatic abdominal aortic aneurysms is recommended when the risk of rupture exceeds the risk of repair and is performed in patients with sufficient life expectancy to allow them to benefit from such a prophylactic procedure. Most elderly, or medically high risk patients, have insufficient life expectancy and are at higher risk of complications following endovascular repair to warrant intervention.

5 Don't perform unnecessarily frequent ultrasound examinations in asymptomatic patients with small abdominal aortic aneurysms. Aneurysms smaller than 4.5cm in diameter should undergo ultrasound surveillance every 12 months.

Regular ultrasound examination of asymptomatic patients with small abdominal aortic aneurysms is essential to document aneurysm growth and decide when intervention is warranted. The interval between examinations is dictated by the size of the aneurysm and its expected growth rate. Too frequent examinations can cause undue patient anxiety and are not cost effective.

How the list was created

The Canadian Society for Vascular Surgery (CSVS) established its *Choosing Wisely Canada* Top 5 recommendations by canvassing its members for suggestions for investigations or procedures that should not be performed, should be performed rarely or should only be performed under certain circumstances. A subgroup of the CSVS Executive Committee reviewed the membership's suggestions and made a list of five draft recommendations. The CSVS Executive Committee provided feedback and the evidence and literature were reviewed to make sure these recommendations were evidence based. The final list was approved by the CSVS Executive Committee.

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About The Canadian Society for Vascular Surgery

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