

# Emergency Medicine

## Ten Things Physicians and Patients Should Question

by  
Canadian Association of Emergency Physicians  
Last updated: July 2019



### 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, an event that is 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 who lack high-risk features 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 increase the detection of false-positives (incidental, non-clinically relevant findings). There is strong evidence that physicians should not order CT head scans for patients with minor head injury unless validated clinical decision rules are used to make imaging decisions (i.e., Canadian CT head rule for adults, and Canadian Assessment of Tomography for Childhood Head Injury (CATCH) and/or PECARN rules for children). However, CATCH has been shown to be less sensitive than PECARN at detecting any brain injury on CT. While we recommend the use of clinical decision rules (CDRs) for head injuries, these rules are meant to assist and not replace, clinical judgment.

### 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.**

Justification (revised): 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 an acute care setting such as the emergency department, using local anesthesia or procedural sedation, with complete drainage and appropriate follow-up. Antibiotics may be considered when patients are immunocompromised, systemically ill, or exhibit extensive surrounding cellulitis or lymphangitis. In populations with a high [methicillin-resistant *S. aureus*] MRSA prevalence, there is some evidence to suggest that antibiotics in addition to incision and drainage of uncomplicated abscesses may confer some benefit. However, we encourage physicians to discuss the use of antibiotics in uncomplicated abscesses with patients as the benefits conferred by antibiotics may not outweigh the risks associated with their use (i.e. nausea, diarrhea, and allergic reactions).

**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 routinely 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 they are associated with fewer complications and a slightly shorter course of illness. Inappropriate administration of antibiotics can expose patients to unnecessary risks (i.e., allergies, rash, and diarrhea) and increase overall antibiotic resistance in the community. Evidence suggests that antibiotics should only be used in patients with intermediate and high clinical prediction scores for GAS (CENTOR or FeverPAIN score) AND confirmatory testing (throat cultures or rapid testing) that is positive for GAS.

**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.

## Sources

- 1 Babl FE, et al. Accuracy of PECARN, CATCH, and CHALICE head injury decision rules in children: a prospective cohort study. *Lancet*. 2017; 389 (10087):2393-2402. [PMID:28410792](#).  
Osmond MH, et al. CATCH: a clinical decision rule for the use of computed tomography in children with minor head injury. *CMAJ*. 2010; 182(4):341-8. [PMID: 20142371](#).
- 2 Farley R, et al. Antibiotics for bronchiolitis in children under two years of age. *Cochrane Database Syst Rev*. 2014; 10:CD005189. [PMID: 25300167](#).  
Graham V, et al. Antibiotics for acute asthma. *Cochrane Database Syst Rev*. 2001; (3):CD002741. [PMID: 11687022](#).  
Smith SM, et al. Antibiotics for acute bronchitis. *Cochrane Database Syst Rev*. 2014; 3:CD000245. [PMID: 24585130](#).
- 3 Chou R, et al. Imaging strategies for low-back pain: systematic review and meta-analysis. *Lancet*. 2009; 373(9662):463-72. [PMID: 19200918](#).  
Chou R, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. *Ann Intern Med*. 2007; 147(7):478-91. [PMID: 17909209](#).  
Toward Optimized Practice. Guideline for the evidence-informed primary care management of low back pain, 2nd Edition. Edmonton, AB: Toward Optimized Practice; 2011.
- 4 Michaleff ZA, et al. Accuracy of the Canadian C-spine rule and NEXUS to screen for clinically important cervical spine injury in patients following blunt trauma: a systematic review. *CMAJ*. 2012; 184(16):E867-76. [PMID: 23048086](#).  
Stiell IG, et al. Implementation of the Canadian C-Spine Rule: prospective 12 centre cluster randomised trial. *BMJ*. 2009; 339:b4146. [PMID: 19875425](#).  
Stiell IG, et al. The Canadian C-spine rule versus the NEXUS low-risk criteria in patients with trauma. *N Engl J Med*. 2003; 349(26):2510-8. [PMID: 14695411](#).
- 5 Daum RS, et al. A placebo-controlled trial of antibiotics for smaller skin abscesses. *N Engl J of Med*. 2017; 376(26):2545-2555. [PMID:28657870](#).  
Talan DA, et al. Trimethoprim-Sulfamethoxazole versus placebo for uncomplicated skin abscess. *N Engl J Med*. 2016; 374(9):823-32. [PMID: 26962903](#).  
Vermandere, M, et al. Antibiotics after incision and drainage for uncomplicated skin abscesses: a clinical practice guideline. *BMJ*. 2018; 360:k243. [PMID: 29437651](#).
- 6 Goyal N, et al. The utility of head computed tomography in the emergency department evaluation of syncope. *Intern Emerg Med*. 2006;1(2):148-50. [PMID: 17111790](#).  
Grossman SA, et al. The yield of head CT in syncope: a pilot study. *Intern Emerg Med*. 2007 Mar;2(1):46-9. Epub 2007 Mar 31. [PMID: 17551685](#).  
Sheldon RS, et al. Standardized approaches to the investigation of syncope: Canadian Cardiovascular Society position paper. *Can J Cardiol*. 2011 Mar-Apr;27(2):246-53. [PMID: 21459273](#).
- 7 Kline JA, et al. Prospective multicenter evaluation of the pulmonary embolism rule-out criteria. *J Thromb Haemost*. 2008 May;6(5):772-80. [PMID: 18318689](#).  
Singh B, et al. Diagnostic accuracy of pulmonary embolism rule-out criteria: a systematic review and meta-analysis. *Ann Emerg Med*. 2012 Jun;59(6):517-20. [PMID: 22177109](#).  
Wells PS, et al. Excluding pulmonary embolism at the bedside without diagnostic imaging: management of patients with suspected pulmonary embolism presenting to the emergency department by using a simple clinical model and d-dimer. *Ann Intern Med*. 2001 Jul 17;135(2):98-107. [PMID: 11453709](#).
- 8 Centor RM, Witterspoon JM, Dalton HP, Brody CE, Link K. The diagnosis of strep throat in adults in the emergency room. *Med Decis making*. 1981;1:239-46. [PMID: 6763125](#).  
Institut national d'excellence en santé et en services sociaux (INESSS). [Pharyngite-amygdalite chez l'enfant et l'adulte](#) [Internet]. Reviewed 2017 [cited 2018 Feb 14].  
Little P, Moore M, Hobbs FD, Mant D, McNulty C, Williamson I, et al. PRImary care Streptococcal Management (PRISM) study: identifying clinical variables associated with Lancefield group A  $\beta$ -haemolytic streptococci and Lancefield non-Group A streptococcal throat infections from two cohorts of patients presenting with an acute sore throat. *BMJ Open*. 2013;3. [PMID: 24163209](#).
- 9 Plint AC, et al. Validation of the Ottawa Ankle Rules in children with ankle injuries. *Acad Emerg Med*. 1999 Oct;6(10):1005-9. [PMID: 10530658](#).  
Stiell IG. [Ottawa Ankle Rules by Dr. Ian Stiell](#) [Video file]. 2015 Jul 7 [cited 2015 Nov 23].  
Stiell IG, et al. Implementation of the Ottawa ankle rules. *JAMA*. 1994 Mar 16;271(11):827-32. [PMID: 8114236](#).
- 10 Centre for Clinical Practice at NICE (UK). Respiratory Tract Infections - Antibiotic Prescribing: Prescribing of Antibiotics for Self-Limiting Respiratory Tract Infections in Adults and Children in Primary Care. London: National Institute for Health and Clinical Excellence (UK); 2008 Jul. [PMID: 21698847](#).  
Spurling GK, et al. Delayed antibiotics for respiratory infections. *Cochrane Database Syst Rev*. 2013 Apr 30;4:CD004417. [PMID: 23633320](#).  
Venekamp RP, et al. Antibiotics for acute otitis media in children. *Cochrane Database Syst Rev*. 2015 Jun 23;6:CD000219. [PMID: 26099233](#).



---

### **About the Canadian Association of Emergency Physicians**

CAEP is 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.

---

### **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.

🌐 [ChoosingWiselyCanada.org](http://ChoosingWiselyCanada.org) | ✉ [info@ChoosingWiselyCanada.org](mailto:info@ChoosingWiselyCanada.org) | 🐦 [@ChooseWiselyCA](https://twitter.com/ChooseWiselyCA) | 📘 [/ChoosingWiselyCanada](https://www.facebook.com/ChoosingWiselyCanada)