

AUSTRALASIAN COLLEGE FOR EMERGENCY MEDICINE: TESTS, TREATMENTS AND PROCEDURES HEALTH PROFESSIONALS AND CONSUMERS SHOULD QUESTION

ACEM is the not-for-profit organisation responsible for training emergency physicians and advancing professional standards in emergency medicine in Australia and New Zealand.

1. Avoid requesting computed tomography (CT) imaging of kidneys, ureters and bladder (KUB) in otherwise healthy emergency department patients, age <50 years, with a known history of kidney stones, presenting with symptoms and signs consistent with uncomplicated renal colic.

Acute flank pain due to suspected renal colic is a common clinical presentation in the emergency department. While a CT-KUB allows a rapid, contrast-free diagnosis of kidney stones, it is a high ionizing-radiation technique. Younger patients with typical renal colic pain that remits spontaneously, or with analgesia, and have no features on history, examination or laboratory investigations that suggest complicated renal stones or a serious alternate diagnosis can be managed without repeated imaging. Concerning features include fever, features of urinary tract infection, lack of haematuria, ongoing high analgesia requirements, or palpable abdominal mass.

Supporting Evidence

- Moore CL, Bomann S, Daniels B, Luty S, Molinaro A, Singh D, Gross CP. Derivation and validation of a clinical prediction rule for uncomplicated ureteral stone—the STONE score: retrospective and prospective observational cohort studies. *BMJ*. 2014;348:g2191.
- Katz SI, Saluja S, Brink JA, Forman HP. Radiation dose associated with unenhanced CT for suspected renal colic: impact of repetitive studies. *Am J Roentolog*. 2006;186(4):1120-4.
- Patatas K, Panditaratne N, Wah TM, Weston MJ, Irving HC. 2012. Emergency department imaging protocol for suspected acute renal colic: re-evaluating our service. *Emergency*. 2014;85(1016).
- Broder J, Bowen J, Lohr J, Babcock A, Yoon J. Cumulative CT exposures in emergency department patients evaluated for suspected renal colic. *J Emerg Med*. 2007;33(2):161-8.
- Smith-Bindman R, Aubin C, Bailitz J, Bengiamin, RN, Camargo CA Jr, Corbo J, Dean AJ, Goldstein RB, Griffey RT, Jay GD, Kang TL, Kriesel DR, Ma OJ, Mallin M, Manson, W, Melnikow J, Miglioretti DL, Miller, SK, Mills LD, Miner JR, Moghadassi M, Noble VE, Press GM, Stoller ML, Valencia VE, Wang J, Wang RC, Cummings SR. Ultrasonography versus computed tomography for suspected nephrolithiasis. *N Engl J Med*. 2014. 371:12.

Resources

Read about [Guidelines on Diagnostic Imaging](#) on the Australasian College for Emergency Medicine website

2. Avoid coagulation studies in emergency department patients unless there is a clearly defined specific clinical indication, such as for monitoring of anticoagulants, in patients with suspected severe liver disease, coagulopathy, or in the assessment of snakebite envenomation*.

*** Point of care testing (POCT) devices are unreliable in assessment of snakebite envenomation.**

Abnormal coagulation test results in conditions such as acute coronary syndrome can usually be predicted by history, and they rarely affect patient management. Routine coagulation studies in the emergency department therefore represent a substantial added cost, with no benefit to patients. Coagulation studies should be performed based on a history of warfarin or heparin use, or a history of severe liver disease.

Please refer to the joint ACEM/Royal Australian College of Pathologists Guideline on Pathology Testing in the Emergency Department, for further guidance on appropriate pathology test requesting in emergency departments.

** Point of care testing (POCT) devices are unreliable in assessment of snakebite envenomation.*

Supporting Evidence

- Schwartz D. Utility of routine coagulation studies in emergency department patients with suspected acute coronary syndromes. *Isr Med Assoc J.* 2005;7(8):502-6.
- Martin D, Beardsell I. Is routine coagulation testing necessary in patients presenting to the emergency department with chest pain? *Emerg Med J.* 2012;29(3):184-7.
- Hodgson D, Burdett-Smith P. Towards evidence-based emergency medicine: best BETs from the Manchester Royal Infirmary: Routine coagulation testing in adult patients with epistaxis. *Emerg Med J* 2011;28(7):633-4.
- Segall J, Dzik WH. Paucity of studies to support that abnormal coagulation test results predict bleeding in the setting of invasive procedures: an evidence based review. *Transfusion.* 2005; 45(9): 1413-25.
- Darcy MD, Kanterman RY, Kleinhoffer MA, Vesely TM, Picus D, Hicks ME, and Pilgram TK. Evaluation of coagulation tests as predictors of angiographic bleeding complications. *Radiology.* 1996; 198 (3): 741-4.
- Murphy E, MacGlone S, McGroarty. A novel approach to improving sample ordering in an emergency department. *BMJ Qual Improv Report* 2015;4.
- Geoffrey K Isbister, Simon G A Brown, Colin B Page, David L McCoubrie, Shaun L Greene and Nicholas A Buckley. 2013. Snakebite in Australia: a practical approach to diagnosis and treatment. *Med J Aust* 2013; 199 (11): 763-768.
- NSW Ministry of Health. 2014. Snakebite and Spiderbite Clinical Management Guidelines. 3rd edition. www0.health.nsw.gov.au/policies/gl/2014/pdf/GL2014_005.pdf

Resources

Read about [Guideline on Pathology Testing in the Emergency Department](#) on the Australasian College for Emergency Medicine website

3. Avoid blood cultures in patients who are not systemically septic, have a clear source of infection and in whom a direct specimen for culture (e.g. urine, wound swab, sputum, cerebrospinal fluid, or joint aspirate) is possible.

Blood cultures taken in an emergency department do not add more information that would aid clinical management; they also represent a significant cost. The rate of false positives in blood cultures has been reported as approximately 50% and other, more direct, tests have been shown to have a markedly higher yield – i.e. a diagnostic procedure that often results in a definitive diagnosis.

Please refer to the joint ACEM/Royal Australian College of Pathologists Guideline on Pathology Testing in the Emergency Department for further guidance on appropriate pathology test requesting in emergency departments.

Supporting Evidence

- Cham G, Yan S, Heng BH, Seow E. Predicting positive blood cultures in patients presenting with pneumonia at an ED in Singapore. *Ann Acad Med Singapore.* 2009;38(6): 508-17.
- Kennedy M, Bates DW, Wright SB, Ruiz R, Wolfe RE, Shapiro NI. Do emergency department blood cultures change practice in patients with pneumonia? *Ann Emerg Med.* 2005; 46(5):393-400.
- Shah SS, Dugan MH, Bell LM, Grundmeier RW, Florin TA, Hines EM, and Metlay JP. Blood cultures in the Emergency Department Evaluation of Childhood Pneumonia. *Pediatr Inf Dis J.* 2011; 30(6): 475-9.
- Makam AN, Auerbach AD, Steinman MA. Blood culture use in the ED in patients hospitalised for community-acquired pneumonia. *JAMA Intern Med.* 2014; 174(5):803.
- Kelly AM. Clinical impact of blood cultures taken in the emergency department. *J Acc Emerg Med* 1998;

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- Mountain D, Bailey PM, O'Brien D, Jelinek GA. Blood cultures ordered in the adult emergency department are rarely useful. *Eur J Emerg Med.* 2006; 13(2): 76-9.

4. For emergency department patients approaching end-of-life, ensure clinicians, patients and families have a common understanding of the goals of care.

The emergency department is a challenging environment for end-of-life care, presenting ethical and quality of life issues. Research indicates that over 50% of Australians who die an 'anticipated' or 'expected' death, will die in acute hospitals, even though the majority approaching end-of-life wish to die at home. In this context, clinicians, patients and their families should work together to ensure they have a common understanding of the goals of care. Values and wishes around medical treatment should be documented. Monitoring and investigations should be appropriate. Clinicians should advocate for the patient by initiating discussion about end-of-life care with inpatient clinicians and community health professionals. When possible, arrange for end-of-life patients to be transferred to a palliative care facility to avoid admission to acute wards.

Supporting evidence

- Lukin W, Douglas C, O'Connor A. Palliative care in the emergency department: An oxymoron or just good medicine? *Emerg Med Austral* 2012;(24):102-4.
- Forero R, McDonnell G, Gallego B, McCarthy S, Mohsin M, Shanley C, Formby F, Hillman K. A Literature Review on Care at the End-of-Life in the Emergency Department. *Emerg Med Internat* 2012;1-11. Article ID 486516
- Australasian College for Emergency Medicine. 2015. Curriculum Framework.

Resources

- Read about [End of Life Care in the Emergency Department](#) on the Emergency Care Institute website.
- Read about [Guideline on Pathology Testing in the Emergency Department](#) on the Australasian College for Emergency Medicine website.

5. Don't request imaging of the cervical spine in trauma patients, unless indicated by a validated clinical decision rule.

Cervical spine imaging of every trauma patient is costly and results in significant radiation exposure to a large number of patients, very few of whom will have a spinal column injury. Clinical decision rules have been developed that identify patients who can safely be managed without imaging. These rules include the Canadian C-Spine rule or Nexus Low Risk Criteria. The Canadian C-Spine Rule provides higher specificity and lower imaging requirements, and should be used if possible.

This is a joint recommendation with The Royal Australian and New Zealand College of Radiologists (RANZCR).

Supporting evidence

- Stiell IG, Wells GA, Vandemheen KL, Clement CM, Lesiuk H, De Maio VJ, Laupacis A, Schull M, McKnight RD, Verbeek R, Brison R, Cass D, Dreyer J, Esenhauer MA, Greenberg GH, MacPhail I, Morrison L, Reardon M, and Worthington J. The Canadian C-spine rule for radiography in alert and stable trauma patients. *JAMA.* 2001;286(15):1841-1848.
- Stiell IG, Clement CM, McKnight RD, Brison R, Schull MJ, Rowe BH, 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.
- Anderson PA, Muchow RD, Munoz A, Tontz WL, and Resnick DK. Clearance of the asymptomatic cervical spine: a meta-analysis. *J Orthop Trauma.* 2010;24(2):100- 106.

Resources

Read about [Guidelines on Diagnostic Imaging](#) on the Australasian College for Emergency Medicine website.

6. Don't request computed tomography (CT) head scans in patients with a head injury, unless indicated by a validated clinical decision rule.

Most head injuries presenting to emergency departments will be minor and do not require immediate neurosurgical intervention or inpatient care. Mild head injury patients can be risk stratified into 'low' or 'high' risk groups based on the presence or absence of identified clinical risk factors. Current validated clinical decision rules include the Canadian CT Head Rule (for adults) or the PECARN (Paediatric Emergency Care Applied Research Network) Tool (for children). These rules can safely identify patients who can be discharged home, without CT scanning.

This is a joint recommendation with The Royal Australian and New Zealand College of Radiologists (RANZCR).

Supporting evidence

- Harnan SE, Pickering A, Pandor A, Goodacre SW. Clinical decision rules for adults with minor head injury: a systematic review. *J Trauma*. 2011;71(1):245-51.
- Pandor A, Goodacre S, Harnan S, Holmes M, Pickering A, Fitzgerald P et al. Diagnostic management strategies for adults and children with minor head injury: a systematic review and economic evaluation. *Health Technol Assess*. 2011;15(27):1-202.
- Papa L, Stiell IG, Clement CM, Pawlowicz A, Wolfram A, Braga C, Draviam S, and Wells GA. Performance of the Canadian CT Head Rule and the New Orleans Criteria for Predicting Any Traumatic Intracranial Injury on Computed Tomography in a United States Level I Trauma Center. *Acad Emerg Med*. 2012;19:2-10.

Resources

- Read about [Guidelines on Diagnostic Imaging](#) on the Australasian College for Emergency Medicine website.

How was this list created?

A Choosing Wisely Working Group of 9 emergency physicians identified an initial list of 10 potential items. All ACEM members were able to provide feedback on these items and suggest other issues for consideration. This feedback informed Working Group refinement of the initial list into 8 recommendations. Evidence reviews were then completed for each recommendation. These evidence reviews, frequency of use in ED, risks/benefit to patient and cost were used as criteria for Working Group member voting in order to determine the final 6 recommendations. These recommendations have been endorsed by ACEM's Council of Advocacy, Practice and Partnerships.

Following identification of two common recommendations with the Royal Australian and New Zealand College of Radiologists, it was agreed by both Colleges to jointly present these items.

Recommendations from the Australasian College for Emergency Medicine on CT scans for head injury and renal colic, end-of-life care, cervical spine (neck) imaging and coagulation studies.