

THE ROYAL AUSTRALIAN AND NEW ZEALAND COLLEGE OF RADIOLOGISTS: TESTS, TREATMENTS AND PROCEDURES CLINICIANS AND CONSUMERS SHOULD QUESTION

The Royal Australian and New Zealand (RANZCR) is a not-for-profit association of members who deliver skills, knowledge, insight, time and commitments to promote the science and practice of the medical specialties of clinical radiology (diagnostic and interventional) and radiation oncology in Australia and New Zealand.

1. Don't request imaging for acute ankle trauma unless indicated by the Ottawa Ankle Rules (localised bone tenderness or inability to weight-bear as defined in the Rules).

Most clinically significant acute ankle injuries can be diagnosed with history, examination, and selective use of plain radiography.

Extensive validation studies have shown that the Ottawa Ankle Rules can be safely applied to adult and paediatric populations.

Selective use of plain radiography in patients with acute ankle injury is useful in identifying patients who have sustained clinically important fracture, dislocation, and osteochondral injuries. However, acute ligamentous injuries involving the anterior talofibular ligament can be diagnosed clinically and treated symptomatically.

When there are persistent symptoms (such as pain and swelling) after an acute injury, which raise suspicion of either instability or other internal derangement, such as osteochondral injury, MRI can be used if the non-urgent (or delayed or elective or similar) weight bearing x-rays show no abnormality.

Recommendation released April 2015

Supporting Evidence

- Stiell IG, Greenberg GH, McKnight RD, Nair RC, McDowell I, Worthington JR. A study to develop clinical decision rules for the use of radiography in acute ankle injuries. *Ann Emerg Med.* 1992; 21(4): 384-90.

Clinician resources

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- Additional websites that would be useful to include for both health consumers and medical practitioners include:
 - InsideRadiology (for clinical radiology): www.insideradiology.co.nz
 - Targeting Cancer (for radiation oncology): <http://www.targetingcancer.co.nz>

2. Don't request duplex compression ultrasound for suspected lower limb deep venous thrombosis in ambulatory outpatients unless the Wells Score (deep venous thrombosis risk assessment score) is greater than 2, OR if less than 2, D dimer assay is positive.

The potential complications of untreated deep venous thrombosis (DVT) include thrombus propagation, pulmonary embolism (PE) and death from PE. A significant but under-appreciated longer-term complication is post-thrombotic syndrome (PTS) and this can occur in up to 40% of patients with proximal DVT, as a result of venous incompetence and hypertension.

Wells et al. (2003) showed that ambulatory outpatients with suspected lower limb DVT and a DVT risk assessment score (Wells Score) of less than 2, can have DVT excluded by a negative result on D dimer assay, obviating the need to perform duplex compression ultrasound. The lower limit of the negative predictive value of the combination of a score <2 and negative D dimer was found to be 96.7. The Wells Score has been extensively and externally validated since first publication.

Recommendation released April 2015

Supporting Evidence

- Wells PS, Anderson DR, Rodger M, Forgie M, Kearon C, Dreyer J, et al. Evaluation of D-dimer in the diagnosis of suspected deep-vein thrombosis. *N Engl J Med.* 2003; 349(13): 1227-35.
- Oudega R, Moons KG, Hoes AW. Ruling out deep venous thrombosis in primary care. A simple diagnostic algorithm including D-dimer testing. *Thromb Haemost.* 2005; 94(1): 200-5.

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3. Don't request any diagnostic testing for suspected pulmonary embolism (PE) unless indicated by Wells Score (or Charlotte Rule) followed by PE Rule-out Criteria (in patients not pregnant). Low risk patients in whom diagnostic testing is indicated should have PE excluded by a negative D dimer, not imaging.

Pulmonary embolism (PE) affects 2-3 per 1000 adults per year. It can be fatal if untreated, more often in hospitalised people than outpatients. The symptoms and signs of PE (chest pain, cough, dyspnoea, and tachycardia) are non specific and so imaging is required to make the diagnosis.

PE is diagnosed by direct (CT pulmonary angiogram) or indirect (ventilation/perfusion or "V/Q" lung scanning) demonstration of the emboli within the pulmonary arterial tree. PE can be excluded in low risk patients by a negative result on whole blood D dimer. Some low risk patients ("Pulmonary Embolism Rule-out Criteria [PERC] negative") are at such low risk they require no diagnostic testing, including D dimer.

Clinical decision rules (CDRs) are more specific than clinical gestalt in determining which patients are unlikely to have PE, and thus can prevent unnecessary imaging in these groups.

Validated risk assessment strategies are not applicable to pregnant women and D dimer is physiologically elevated early in pregnancy. Ventilation perfusion lung scanning is the test of choice in the presence of a normal chest radiograph in a pregnant woman with suspected PE as the radiation dose to the breast is much

lower than for CT pulmonary angiography and the fetal dose is very small and comparable for both imaging tests.

Recommendation released April 2015

Supporting Evidence

- Lucassen W, Geersing GJ, Erkens PM, Reitsma JB, Moons KG, Buller H, et al. Clinical decision rules for excluding pulmonary embolism: A meta-analysis. *Ann Intern Med.* 2011; 155(7): 448-60.
- Wells PS, Anderson DR, Rodger M, Ginsberg JS, Kearon C, Gent M, et al. Derivation of a Simple Clinical Model to Categorize Patients Probability of Pulmonary Embolism-Increasing the Models Utility with the SimpliRED D-dimer. *Thromb Haemost.* 2000; 83(3): 416-20. Stuttgart.
- Gibson NS, Sohne M, Kruip MJ, Tick LW, Gerdes VE, Bossuyt PM, et al. Further validation and simplification of the Wells clinical decision rule in pulmonary embolism. *Thromb Haemost.* 2008; 99(1): 229-34.
- Le Gal G, Righini M, Roy P, Sanchez O, Aujesky D, Bounameaux H, et al. Prediction of pulmonary embolism in the emergency department: The Revised Geneva Score. *Ann Intern Med.* 2006; 144(3): 165-71.
- Klok FA, Mos IC, Nijkeuter M, Righini M, Perrier A, Le Gal G, et al. Simplification of the Revised Geneva score for assessing clinical probability of pulmonary embolism. *Arch Intern Med.* 2008; 168(19): 2131-6.
- Douma RA, Gibson NS, Gerdes VE, Buller HR, Wells PS, Perrier A, et al. Validity and clinical utility of the Simplified Wells rule for assessing clinical probability for the exclusion of pulmonary embolism. *Thromb Haemost.* 2009; 101(1): 197-200.
- Kline JA, Nelson RD, Jackson RE, Courtney DM. Criteria for the safe use of D-dimer testing in emergency department patients with suspected pulmonary embolism: A multicenter US study. *Ann Emerg Med.* 2002; 39(2): 144-52.
- Kline JA, Mitchell AM, Kabrhel C, Richman PB, Courtney DM. Clinical criteria to prevent unnecessary diagnostic testing in emergency department patients with suspected pulmonary embolism. *J Thromb Haemost.* 2004; 2(8): 1247-55.
- Kline JA, Courtney DM, Kabrhel C, Moore CL, Smithline HA, Plewa MC, et al. Prospective multicenter evaluation of the Pulmonary Embolism Rule-out Criteria. *J Thromb Haemost.* 2008; 6(5): 772-80.
- Singh B, Parsaik AK, Agarwal D, Surana A, Mascarenhas SS, Chandra S. Diagnostic accuracy of Pulmonary Embolism Rule-out Criteria: A systematic review and meta-analysis. *Ann Emerg Med.* 2012; 59(6): 517-20.e4.
- McLintock C, Brighton T, Chunilal S, Dekker G, McDonnell N, McRae S, et al. Recommendations for the diagnosis and treatment of deep venous thrombosis and pulmonary embolism in pregnancy and the postpartum period. *Aust N Z J Obstet Gynaecol.* 2012; 52(1): 14-22.
- Douma RA, Mos IC, Erkens PM, Nizet TAC, Durian MF, Hovens MM, et al. Performance of 4 clinical decision rules in the diagnostic management of acute pulmonary embolism - A prospective cohort study. *Ann Intern Med.* 2011; 154(11): 709-18.
- Wolf SJ, McCubbin TR, Nordenholz KE, Naviaux NW, Haukoos JS. Assessment of the Pulmonary Embolism Rule-out Criteria rule for evaluation of suspected pulmonary embolism in the emergency department. *Am J Emerg Med.* 2008; 26(2): 181-5.
- Kline JA, Peterson CE, Steuerwald MT. Prospective evaluation of real time use of the Pulmonary Embolism Rule-out Criteria in an academic emergency department. *Acad Emerg Med.* 2010; 17(9): 1016-9.
- Penalzoza A, Verschuren F, Dambrine S, Zech F, Thys F, Roy P-M. Performance of the Pulmonary Embolism Rule-out Criteria (the PERC rule) combined with low clinical probability in high prevalence population. *Thromb Res.* 2012; 129(5): e189-93.

Clinician resources

- [Diagnostic imaging respiratory pathways](#) - Read about [Diagnostic imaging respiratory pathways information](#) on the Diagnostic Imaging Pathways website
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4. Don't perform imaging for patients with non-specific acute low back pain and no indicators of a serious cause for low back pain.

Low back pain (LBP) is extremely common, being the third most common health complaint seen by Australian general practitioners.

A simple classification places patients into one of three categories:

- *LBP associated with sciatica or spinal canal stenosis*
- *Serious spinal pathology (such as cancer, infection, fracture, and cauda equina syndrome) comprises 1% of GP presentations with LBP*
- *Non-specific low back pain (90% of presentations)*

When evaluating patients with acute LBP, one of the key issues to be addressed is whether or not the patient should be investigated using imaging to confirm or refute the presence of an underlying/associated condition that would change the subsequent medical treatment or investigation of the patient.

Age over 70 years, trauma, corticosteroid therapy, and female gender are risk factors for fracture and previous or current cancer significantly increases the likelihood of cancer related back pain. At least one of fever, systemic symptoms, recent invasive procedure or sepsis, or elevated CRP are seen in most but not all patients with discitis or epidural abscess. New lower limb or bladder motor dysfunction increase the likelihood of cauda equina syndrome in a patient with LBP and are indications for emergency MRI.

Recommendation released April 2015

Supporting evidence

- Henschke N, Maher CG, Refshauge KM, et al. Prognosis in patients with recent onset low back pain in Australian primary care: inception cohort study. *BMJ (Clinical Research Ed)*. 2008; 337: a171.
- Koes BW, van Tulder M, Lin CW, Macedo LG, McAuley J and Maher C. An updated overview of clinical guidelines for the management of non-specific low back pain in primary care. *Eur Spine J*. 2010.
- Henschke N, Maher C, Refshauge K, et al. Prevalence of and screening for serious spinal pathology in patients presenting to primary care settings with acute low back pain. *Arthritis Rheum*. 2009; 60: 3072-80.
- Chou R, Qaseem A, Owens DK and Shekelle P. Diagnostic Imaging for Low Back Pain: Advice for High-Value Health Care From the American College of Physicians. *Ann Intern Med*. 2011; 154: 181-9.
- Williams CM, Henschke N, Maher CG, et al. Red flags to screen for vertebral fracture in patients presenting with low back pain. *Cochrane Database Syst Rev* 2013. 2013.
- Henschke N, Maher CG, Ostelo RW, de Vet HC, Macaskill P and Irwig L. Red flags to screen for

malignancy in patients with low-back pain. Cochrane Database Syst Rev 2013. 2013; 2.

- Henschke N, Maher C and Refshauge K. Screening for malignancy in low back pain patients: a systematic review. Eur Spine J. 2007; 16: 1673-9.

Clinician resources

- [Back pain symptomatic management pad](#) Download the [Managing your acute low back pain - symptomatic management pad](#). A helpful tool for health professionals to use with their patients available from the NPS MedicineWise website
- [RANZCR Appropriate Use of Medical Imaging Android App](#) Find the [RANZCR Appropriate Use of Medical Imaging App](#) on the GooglePlay Store.
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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, et al. The Canadian C-Spine Rule for radiography in alert and stable trauma patients. JAMA. 2001; 286(15): 1841-8.
- Hoffman JR, Wolfson AB, Todd K, Mower WR. Selective cervical spine radiography in blunt trauma: methodology of the National Emergency X-Radiography Utilization Study (NEXUS). Ann Emerg Med. 1998; 32(4): 461-9.
- 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.
- Miller P, Coffey F, Reid A-M, Stevenson K. Can emergency nurses use the Canadian cervical spine rule to reduce unnecessary patient immobilisation? Accid Emerg Nurs. 2006; 14(3): 133-40.
- Vaillancourt C, Stiell IG, Beaudoin T, Maloney J, Anton AR, Bradford P, et al. The out-of-hospital validation of the Canadian C-Spine Rule by paramedics. Ann Emerg Med. 2009; 54(5): 663-71 e1.
- Hoffman JR, Mower WR, Wolfson AB, Todd KH, Zucker MI. Validity of a set of clinical criteria to rule out injury to the cervical spine in patients with blunt trauma. National Emergency X-Radiography Utilization Study Group. N Engl J Med. 2000; 343(2): 94-9.
- Mahler S, Pattani S, Caldito G. Use of a clinical sobriety assessment tool with the NEXUS low-risk cervical spine criteria to reduce cervical spine imaging in blunt trauma patients with acute alcohol or drug use: A pilot study. Ann Emerg Med. 2009; 54: S26-7.
- Griffith B, Bolton C, Goyal N, Brown ML, Jain R. Screening cervical spine CT in a level I trauma center: Overutilization? AJR Am J Roentgenol. 2011; 197(2): 463-7.
- Migliore S, Strelkauskas A, Matteucci M. The NEXUS criteria: Inter-rater reliability between residents versus attending physicians in the emergency department. Acad Emerg Med. 2011; 18: S139-40.

- Rethnam U, Yesupalan R, Gandham G. Does applying the Canadian Cervical Spine rule reduce cervical spine radiography rates in alert patients with blunt trauma to the neck? A retrospective analysis. BMC Med Imaging. 2008; 8: 12.
- Coffey F, Hewitt S, Stiell I, Howarth N, Miller P, Clement C, et al. Validation of the Canadian C-spine rule in the UK emergency department setting. Emerg Med J. 2011; 28(10): 873-6.
- Duane TM, Wilson SP, Mayglothling J, Wolfe LG, Aboutanos MB, Whelan JF, et al. Canadian Cervical Spine rule compared with computed tomography: A prospective analysis. J Trauma. 2011; 71(2): 352-7.

Paediatric Specific References

- Viccellio P, Simon H, Pressman BD, Shah MN, Mower WR, Hoffman JR. A prospective multicenter study of cervical spine injury in children. Pediatrics. 2001; 108(2): E20.

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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 Australasian College for Emergency Medicine (ACEM).

Recommendation released April 2015

Supporting Evidence

- Finkelstein E, Corso P, Miller T, Associates. The Incidence and Economic Burden of Injuries in the United States. New York: Oxford University Press; 2006.
- Haydel MJ, Preston CA, Mills TJ, Luber S, Blaudeau E, DeBlieux PM. Indications for computed tomography in patients with minor head injury. N Engl J Med. 2000; 343(2): 100-5.
- Mower W, Hoffman J, Herbert M, Wolfson A, Pollack C, Zucker M, et al. Developing a clinical decision instrument to rule out intracranial injuries in patients with minor head trauma: methodology of the NEXUS II investigation. Ann Emerg Med. 2002; 40(5): 505-14.
- Mower WR, Hoffman JR, Herbert M, Wolfson AB, Pollack CV, Jr., Zucker MI. Developing a decision instrument to guide computed tomographic imaging of blunt head injury patients. J Trauma. 2005; 59(4): 954-9.
- Stiell IG, Lesiuk H, Wells G, McKnight R, Brison R, Clement C, et al. The Canadian CT Head Rule Study for patients with minor head injury: Rationale, objectives, and methodology for phase I (derivation). Ann

Emerg Med. 2001; 38(2): 160-9.

- Stiell IG, Wells GA, Vandemheen K, Clement C, Lesiuk H, Laupacis A, et al. The Canadian CT Head Rule for patients with minor head injury. Lancet. 2001; 357(9266): 1391-6.
- Stiell IG, Lesiuk H, Wells GA, Coyle D, McKnight RD, Brison R, et al. Canadian CT head rule study for patients with minor head injury: methodology for phase II (validation and economic analysis). Annals of emergency medicine. 2001; 38(3): 317-22.
- Ro Y, Shin S, Holmes J, Song K, Park J, Cho J, et al. Comparison of clinical performance of cranial computed tomography rules in patients with minor head injury: a multicenter prospective study. Academic emergency medicine. 2011; 18(6): 597-604.
- Boudia W, Marghli S, Souissi S, Ksibi H, Methammem M, Haguiga H, et al. Prediction Value of the Canadian CT Head Rule and the New Orleans Criteria for Positive Head CT Scan and Acute Neurosurgical Procedures in Minor Head Trauma: A Multicenter External Validation Study. Annals of emergency medicine. 2012; 61(5): 521-7.

Paediatric Specific References

- Kuppermann N, Holmes JF, Dayan PS, Hoyle JD, Jr., Atabaki SM, Holubkov R, et al. Identification of children at very low risk of clinically-important brain injuries after head trauma: a prospective cohort study. Lancet. 2009; 374(9696): 1160-70.
- Dunning J, Daly JP, Lomas JP, Lecky F, Batchelor J, Mackway-Jones K. Derivation of the children's head injury algorithm for the prediction of important clinical events decision rule for head injury in children. Arch Dis Child. 2006; 91(11): 885-91.
- Osmond M, Klassen T, Wells G, Correll R, Jarvis A, Joubert G, 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.

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

Whole-breast radiation therapy decreases local recurrence and improves survival of women with invasive breast cancer treated with breast conservation therapy. Most studies have utilised "conventionally fractionated" schedules that deliver therapy over 5-6 weeks, often followed by 1-2 weeks of boost therapy. Recent studies, however, have demonstrated equivalent tumor control and cosmetic outcome in specific patient populations with shorter courses of therapy (~4 weeks). Patients and their physicians should review these options to determine the most appropriate course of therapy.

Recommendation released October 2016

Supporting Evidence

- Clarke M, Collins R, Darby S, et al. Effects of radiotherapy and of differences in the extent of surgery for early breast cancer on local recurrence and 15-year survival: an overview of the randomised trials. *Lancet* 2005; 366:2087-106.
- Smith BD, Bentzen SM, Correa CR, et al. Fractionation for Whole Breast Irradiation: An American Society for Radiation Oncology (ASTRO) Evidence-Based Guideline. *Int J Radiation Oncology Biol Phys* 2011;81(1):59-68.
- Early Breast Cancer Trialists' Collaborative Group (EBCTCG), Darby S, McGale P, Correa C, et al. Effect of radiotherapy after breast-conserving surgery on 10-year recurrence and 15-year breast cancer death: meta-analysis of individual patient data for 10,801 women in 17 randomised trials. *Lancet* 2011;378:1707-16.
- Haviland JS, Owen JR, Dewar JA, et al. The UK Standardisation of Breast Radiotherapy (START) trials of radiotherapy hypofractionation for treatment of early breast cancer: 10-year follow-up results of two randomised controlled trials. *Lancet Oncol* 2013;14(11):1086-94.

Clinician resources

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8. Don't initiate management of low risk prostate cancer without discussing active surveillance.

Patients with prostate cancer have a number of reasonable management options. These include surgery and 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. ASTRO has published patient-directed written decision aids concerning prostate cancer and numerous other types of cancer. These types of instruments can give patients confidence about their choices, improving compliance with therapy.

Recommendation released October 2016

Supporting Evidence

- Dahabreh IJ, Chung M, Balk EM, et al. Active surveillance in men with localized prostate cancer: a systematic review. *Ann Intern Med* 2012;156(8):582-90.
- Wilt TJ, Brawer MK, Jones KM, et al. Radical prostatectomy versus observation for localized prostate cancer. *N Engl J Med* 2012;367(3):203-13.
- Bill-Axelsson A, Holmberg L, Ruutu M, et al. Radical prostatectomy versus watchful waiting in early prostate cancer. *N Engl J Med* 2011;364(18):1708-17.
- Thompson I, Thrasher JB, Aus G, et al. Guideline for the management of clinically localized prostate cancer. *J Urol* 2007;177(6):2106-31.
- Klotz L, Zhang L, Lam A, et al. Clinical results of long-term follow-up of a large, active surveillance cohort with localized prostate cancer. *J Clin Oncol* 2010;28(1):126-31.
- Stacey D, Bennett CL, Barry MJ, et al. Decision aids for people facing health treatment or screening decisions (Review). *Cochrane Database Syst Rev* 2011;10:CD001431-CD001431.
- Chen RC, Rumble B, Loblaw DA, et al. Active surveillance for the management of localized prostate cancer (Cancer Care Ontario Guideline): American Society of Clinical Oncology Clinical Practice Guideline Endorsement. *J Clin Oncol* 2016; DOI: 10.1200/JCO.2015.65.7759.
- Tosoian JT, Mamawala M, Epstein JI, et al. Intermediate and longer-term outcomes from a prospective active-surveillance program for favourable-risk prostate cancer. *J Clin Oncol* 2015;33(30):3379-85.
- Preston MA, Feldman AS, Coen JJ, et al. Active surveillance for low-risk prostate cancer: need for intervention and survival at 10 years. *Urologic Oncology: Seminars and Original Investigations* 2015; 33(9):383.e9-16.

- Morash C, Tey R, Agbassi C, et al. Active surveillance for the management of localized prostate cancer: Guideline recommendations. *Can Urol Assoc J* 2015;9(5-6):171-8.
- Bul M, Zhu X, Valdagni R, et al. Active surveillance for low-risk prostate cancer worldwide: The PRIAS study. *Eur Urol* 2013;63:597-603.
- Weerakoon M, Papa N, Lawrentschuk N, et al. The current use of active surveillance in an Australian cohort of men: a pattern of care analysis from the Victorian Prostate Cancer Registry. *BJU Int* 2015 Apr;115,Suppl 5:50-6.

Clinician resources

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9. Don't routinely use extended fractionation schemes (>10 fractions) for palliation of bone metastases.

Don't routinely use extended fractionation schemes (>10 fractions) for palliation of bone metastases. Studies suggest equivalent pain relief following 30 Gy in 10 fractions, 20 Gy in 5 fractions, or a single 8 Gy fraction. A single treatment is more convenient but may be associated with a slightly higher rate of retreatment to the same site. Strong consideration should be given to a single 8 Gy fraction for patients with a limited prognosis or with transportation difficulties.

Recommendation released October 2016

Supporting Evidence

- Lutz S, Berk L, Chang E, et al. Palliative radiotherapy for bone metastases: an ASTRO evidence-based guideline. *Int J Radiat Oncol Biol Phys* 2011;79(4):965-76.
- Expert Panel on Radiation Oncology-Bone Metastases: Lutz ST, Lo SSM, Chang EL, et al. ACR Appropriateness Criteria® non-spine bone metastases. *J Palliat Med* 2012;15(5):521-26.
- Chow E, Zheng L, Salvo N et al. Update on the systematic review of palliative radiotherapy trials for bone metastases. *Clin Oncol* 2012;24(2):112-24.

10. Don't routinely add adjuvant whole-brain radiation therapy to stereotactic radiosurgery for limited brain metastases.

Randomised studies have demonstrated no overall survival benefit from the addition of adjuvant whole brain radiation therapy (WBRT) to stereotactic radiosurgery (SRS) in the management of selected patients with good performance status and brain metastases from solid tumors. The addition of WBRT to SRS is associated with diminished cognitive function and worse patient-reported fatigue and quality of life. These results are consistent with the worsened self-reported cognitive function and diminished verbal skills observed in randomised studies of prophylactic cranial irradiation for small cell or non-small cell lung cancer. Patients treated with radiosurgery for brain metastases are at higher risk of developing metastases elsewhere in the brain. Careful surveillance and the judicious use of salvage therapy at the time of brain relapse allow appropriate patients to enjoy the highest quality of life without a detriment in overall survival. Radiation oncologists should discuss these options with patients, including participation in appropriate clinical trials.

Recommendation released October 2016

Supporting Evidence

- Soffiatti R, Kocher M, Abacioqlu UM, et al. A European organisation for research and treatment of cancer phase III trial of adjuvant whole-brain radiotherapy versus observation in patients with one to three brain metastases from solid tumors after surgical resection or radiosurgery: quality-of-life results. *J Clin Oncol* 2013;31(1):65-72.
- Chang EL, Wefel JS, Hess KR, et al. Neurocognition in patients with brain metastases treated with

radiosurgery or radiosurgery plus whole-brain irradiation: a randomized controlled trial. *Lancet Oncol* 2009;10(11):1037-44.

- Aoyama H, Shirato H, Tago M, et al. Stereotactic radiosurgery plus whole-brain radiation therapy vs stereotactic radiosurgery alone for treatment of brain metastases: a randomized controlled trial. *JAMA* 2006;295(21):2483-91.
- Kocher M, Soffiotti R, Abacioglu U, et al. Adjuvant whole-brain radiotherapy versus observation after radiosurgery or surgical resection of one to three cerebral metastases: results of the EORTC 22952-26001 study. *J Clin Oncol* 2011;29:134-41.
- Gondi V, Paulus R, Bruner DW, et al. Decline in tested and self-reported cognitive functioning after prophylactic cranial irradiation for lung cancer: pooled secondary analysis of Radiation Therapy Oncology Group randomized trials 0212 and 0214. *Int J Radiat Oncol Biol Phys* 2013;86(4):656-64.
- Brown PD, Asher AL, Ballman KV, et al. NCCCTG N0574 (Alliance): A phase III randomized trial of whole brain radiation therapy (WBRT) in addition to radiosurgery (SRS) in patients with 1 to 3 brain metastases. *J Clin Oncol* 2015;33(18): suppl LBA4.

11. Don't routinely use extensive locoregional therapy in most cancer situations where there is metastatic disease and minimal symptoms attributable to the primary tumour.

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.

Recommendation released October 2016

Supporting Evidence

- Kleespies A, Füessl KE, Seeliger H, et al. Determinants of morbidity and survival after elective non-curative resection of stage IV colon and rectal cancer. *Int J Colorectal Dis* 2009;24(9):1097-109.
- National Comprehensive Cancer Network. NCCN Guidelines for Colon Cancer Version 3 [Internet]. 2014 [cited 2014 April]. Available from: http://www.nccn.org/professionals/physician_gls/pdf/rectal.pdf
- Badwe R, Parmar V, Hawaldar R, et al. Surgical removal of primary tumor and axillary lymph nodes in women with metastatic breast cancer at first presentation: A randomized controlled trial. *Cancer Res* 2013;73(24 Suppl): Abstract nr S2-02.
- Choosing Wisely Canada. Oncology: Ten things physicians and patients should question. [Internet]. 2014 [cited 2016 March].
- Available from: <http://www.choosingwiselycanada.org/recommendations/oncology/>

Clinician resources

- Additional website that would be useful to include for both health consumers and medical practitioners include:
- Targeting Cancer (for radiation oncology): <http://www.targetingcancer.co.nz>

How was this list created?

Clinical radiology recommendations 1-6 (April 2015)

A team of five Lead Radiologists were nominated to guide RANZCR's Choosing Wisely contribution. These Lead Radiologists analysed previous work completed by RANZCR, in particular a series of [Education Modules for Appropriate Imaging Referrals](#).

These modules had been developed from an extensive evidence base and with multiple stakeholder input. Using the evidence from the Education Modules, the Lead Radiologists developed a draft recommendations list, which was then further developed and endorsed by RANZCR's Quality and Safety Committee, before being circulated to the RANZCR membership for consultation with a request for alternative recommendations. Member feedback was reviewed by the Lead Radiologists prior to ratification of the final recommendations by the Faculty of Clinical Radiology Council. The final six items selected were those that were felt to meet the goals of Choosing Wisely, i.e. those which are frequently requested or which might expose patients to unnecessary radiation.

Due to the fundamental role of diagnostic imaging in supporting diagnosis across the healthcare system, RANZCR worked closely with other Colleges throughout the project via the Advisory Panel. Following identification of two common recommendations with the Australasian College for Emergency Medicine, it was agreed by both Colleges to present these items jointly.

Radiation oncology recommendations 7-12 (October 2016)

Recommendations relating to radiation oncology from the Choosing Wisely and Choosing Wisely Canada were circulated around the Faculty of Radiation Oncology Council to determine which recommendations were applicable to the Australian and New Zealand context. The selected recommendations were then put to the Quality Improvement Committee and the Economics and Workforce Committee, with each being asked to rank the recommendations.

The five highest ranked recommendations were then put to the radiation oncology membership for consultation prior to being formally approved by the Faculty of Radiation Oncology Council.

Recommendations 7-10 are adapted from the American Society for Radiation Oncology (ASTRO) 2013 and 2014 lists. Recommendation 11 is adapted from Choosing Wisely Canada's Oncology list. Each organisation was approached for—and subsequently granted—approval to adapt these recommendations as part of the Choosing Wisely Australia campaign.

Recommendations from the Royal Australian and New Zealand College of Radiologists on (1) imaging for ankle trauma, deep venous thrombosis (DVT), pulmonary embolism (PE), low back pain, cervical spine trauma and head injury, and (2) whole-breast radiation therapy, prostate cancer, bone metastases, whole-brain radiation therapy and locoregional therapy.