

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.

Sources

- 1** Hendel RC, Abbott BG, Bateman TM, Blankstein R, Calnon DA, Leppo JA, et al. The role of radionuclide myocardial perfusion imaging for asymptomatic individuals. *J Nucl Cardiol*. 2011 Feb;18(1):3-15.
Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, et al. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 Appropriate Use Criteria for Cardiac Radionuclide Imaging: A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. *J Am Coll Cardiol*. 2009 Jun 9;53(23):2201-29.
- 2** American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer, Cooper DS, Doherty GM, Haugen BR, Kloos RT, Lee SL, Mandel SJ, Mazzaferri EL, McIver B, Pacini F, Schlumberger M, Sherman SI, Steward DL, Tuttle RM. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2009 Nov;19(11):1167-214.
Lee JC, Harris AM, Khafagimimum FA. Thyroid scans. *Aust Fam Physician*. 2012 Aug;41(8):584-86.
Welker MJ, Orlov D. Thyroid nodules. *Am Fam Physician*. 2003 Feb 1;67(3):559-66.
- 3** Brenner DJ, Hall EJ. Computed tomography--an increasing source of radiation exposure. *N Engl J Med*. 2007 Nov 29;357(22):2277-84.
Burns SK, Haramati LB. Diagnostic imaging and risk stratification of patients with acute pulmonary embolism. *Cardiol Rev*. 2012 Jan-Feb;20(1):15-24.
Fesmire FM, Brown MD, Espinosa JA, Shih RD, Silvers SM, Wolf SJ, et al. Critical issues in the evaluation and management of adult patients presenting to the emergency department with suspected pulmonary embolism. *Ann Emerg Med*. 2011 Jun;57(6):628-652.e75.
Freeman LM, Haramati LB. V/Q scintigraphy: alive, well and equal to the challenge of CT angiography. *Eur J Nucl Med Mol Imaging*. 2009 Mar;36(3):499-504.
Freeman LM, Stein EG, Sprayregen S, Chamarthy M, Haramati LB. The current and continuing important role of ventilation-perfusion scintigraphy in evaluating patients with suspected pulmonary embolism. *Semin Nucl Med*. 2008 Nov;38(6):432-40.
Hurwitz LM, Yoshizumi TT, Goodman PC, Nelson RC, Toncheva G, Nguyen GB, et al. Radiation dose savings for adult pulmonary embolus 64-MDCT using bismuth breast shields, lower peak kilovoltage, and automatic tube current modulation. *AJR Am J Roentgenol*. 2009 Jan;192(1):244-53.
McCollough CH, Primak AN, Braun N, Kofler J, Yu L, Christner J. Strategies for reducing radiation dose in CT. *Radiol Clin North Am*. 2009 Jan;47(1):27-40.
Niemann T, Nicolas G, Roser HW, Müller-Brand J, Bongartz G. Imaging for suspected pulmonary embolism in pregnancy-what about the fetal dose? A comprehensive review of the literature. *Insights Imaging*. 2010 Nov;1(5-6):361-372.
Parker MS, Hui FK, Camacho MA, Chung JK, Broga DW, Sethi NN. Female breast radiation exposure during CT pulmonary angiography. *AJR Am J Roentgenol*. 2005 Nov;185(5):1228-33.
Radiation dose to patients from radiopharmaceuticals (addendum 2 to ICRP publication 53). *Ann ICRP*. 1998;28(3):1-126.
Stein EG, Haramati LB, Chamarthy M, Sprayregen S, Davitt MM, Freeman LM. Success of a safe and simple algorithm to reduce use of CT pulmonary angiography in the emergency department. *AJR Am J Roentgenol*. 2010 Feb;194(2):392-7.
- 4** Abuzalouf S, Dayes I, Lukka H. Baseline staging of newly diagnosed prostate cancer: a summary of the literature. *J Urol*. 2004 Jun;171(6 Pt 1):2122-7.
American Urological Association. Five Things Physicians and Patients Should Question [Internet]. 2013 Feb [cited 2015 Mar 16]. Available from: <http://www.choosingwisely.org/doctor-patient-lists/american-urological-association/>.
Eberhardt SC, Carter S, Casalino DD, Merrick G, Frank SJ, Gottschalk AR, et al. ACR Appropriateness Criteria prostate cancer--pretreatment detection, staging, and surveillance. *J Am Coll Radiol*. 2013 Feb;10(2):83-92.
Heidenreich A, Bastian PJ, Bellmunt J, Bolla M, Joniau S, van der Kwast T, et al. EAU guidelines on prostate cancer. part 1: screening, diagnosis, and local treatment with curative intent-update 2013. *Eur Urol*. 2014 Jan;65(1):124-37.
Kim L, Min M, Roos D, Nguyen L, Yeoh E. Are staging investigations being overused in patients with low and intermediate risk prostate cancer? *J Med Imaging Radiat Oncol*. 2015 Feb;59(1):77-81.
Makarov DV, Desai RA, Yu JB, Sharma R, Abraham N, Albertsen PC, et al. The population level prevalence and correlates of appropriate and inappropriate imaging to stage incident prostate cancer in the medicare population. *J Urol*. 2012 Jan;187(1):97-102.
Wollin DA, Makarov DV. Guideline of Guidelines: Prostate Cancer Imaging. *BJU Int*. 2015 Feb 26.
- 5** Brown JP, Josse RG; Scientific Advisory Council of the Osteoporosis Society of Canada. 2002 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada. *CMAJ*. 2002 Nov 12;167(10 Suppl):S1-34.
Committee on Practice Bulletins-Gynecology, The American College of Obstetricians and Gynecologists. ACOG Practice Bulletin N. 129. Osteoporosis. *Obstet Gynecol*. 2012 Sep;120(3):718-34.
Cosman F, de Beur SJ, LeBoff MS, Lewiecki EM, Tanner B, Randall S, et al. Clinician's Guide to Prevention and Treatment of Osteoporosis. *Osteoporos Int*. 2014 Oct;25(10):2359-81.
Lim LS, Hoeksema LJ, Sherin K; ACPM Prevention Practice Committee. Screening for osteoporosis in the adult U.S. population: ACPM position statement on preventive practice. *Am J Prev Med*. 2009 Apr;36(4):366-75.
U.S. Preventive Services Task Force. Screening for osteoporosis: U.S. preventive services task force recommendation statement. *Ann Intern Med*. 2011 Mar 1;154(5):356-64.

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 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.