

Nuclear Medicine

Five Things Physicians and Patients Should Question

by

Canadian Association of Nuclear Medicine

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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, et al. The role of radionuclide myocardial perfusion imaging for asymptomatic individuals. *J Nucl Cardiol*. 2011 Feb;18(1):3-15. PMID: 21181519.

Hendel RC, et al. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 Appropriate Use Criteria for Cardiac Radionuclide Imaging. *J Am Coll Cardiol*. 2009 Jun 9;53(23):2201-29. PMID: 19497454.
- 2 American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer, et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. *Thyroid*. 2009 Nov;19(11):1167-214. PMID: 19860577.

Lee JC, et al. Thyroid scans. *Aust Fam Physician*. 2012 Aug;41(8):584-86. PMID: 23145398.

Welker MJ, et al. Thyroid nodules. *Am Fam Physician*. 2003 Feb 1;67(3):559-66. PMID: 12588078.
- 3 Brenner DJ, et al. Computed tomography--an increasing source of radiation exposure. *N Engl J Med*. 2007 Nov 29;357(22):2277-84. PMID: 18046031.

Burns SK, et al. Diagnostic imaging and risk stratification of patients with acute pulmonary embolism. *Cardiol Rev*. 2012 Jan-Feb;20(1):15-24. PMID: 22143281.

Fesmire FM, 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. PMID: 21621092.

Freeman LM, et al. 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. PMID: 19183996.

Freeman LM, et al. 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. PMID: 19331837.

Hurwitz LM, 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. PMID: 19098206.

McCullough CH, et al. Strategies for reducing radiation dose in CT. *Radiol Clin North Am*. 2009 Jan;47(1):27-40. PMID: 19195532.

Niemann T, et al. 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. PMID: 22347929.

Parker MS, et al. Female breast radiation exposure during CT pulmonary angiography. *AJR Am J Roentgenol*. 2005 Nov;185(5):1228-33. PMID: 16247139.

Radiation dose to patients from radiopharmaceuticals (addendum 2 to ICRP publication 53). *Ann ICRP*. 1998;28(3):1-126. PMID: 10840563.

Stein EG, et al. 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. PMID: 20093601.
- 4 Abuzalouf S, et al. Baseline staging of newly diagnosed prostate cancer: a summary of the literature. *J Urol*. 2004 Jun;171(6 Pt 1):2122-7. PMID: 15126770.

Choosing Wisely. *American Urological Association: Five Things Physicians and Patients Should Question* [Internet]. 2013 Feb [cited 2015 Mar 16].

Eberhardt SC, et al. ACR Appropriateness Criteria prostate cancer--pretreatment detection, staging, and surveillance. *J Am Coll Radiol*. 2013 Feb;10(2):83-92. PMID: 23374687.

Heidenreich A, 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. PMID: 24207135.

Kim L, et al. 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. PMID: 25186469.

Makarov DV, 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. PMID: 22088337.

Wollin DA, et al. Guideline of Guidelines: Prostate Cancer Imaging. *BJU Int*. 2015 Feb 26. PMID: 25715887.
- 5 Brown JP, et al. 2002 clinical practice guidelines for the diagnosis and management of osteoporosis in Canada. *CMAJ*. 2002 Nov 12;167(10 Suppl):S1-34. PMID: 12427685.

Committee on Practice Bulletins-Gynecology, et al. ACOG Practice Bulletin N. 129. Osteoporosis. *Obstet Gynecol*. 2012 Sep;120(3):718-34. PMID: 22914492.

Cosman F, et al. Clinician's Guide to Prevention and Treatment of Osteoporosis. *Osteoporos Int*. 2014 Oct;25(10):2359-81. PMID: 25182228.

Lim LS, et al. 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. PMID: 19285200.

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. PMID: 21242341.

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.



About Choosing Wisely Canada

Choosing Wisely Canada is the national voice for reducing unnecessary tests and treatments in health care. One of its important functions is to help clinicians and patients engage in conversations that lead to smart and effective care choices.

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