Choosing Wisely®

An initiative of the ABIM Foundation

Society of Nuclear Medicine and Molecular Imaging

SNMMI SOCIETY OF NUCLEAR MEDICINE AND MOLECULAR IMAGING

Five Things Physicians and Patients Should Question

1 Don't use PET/CT for cancer screening in healthy individuals.

- The likelihood of finding cancer in healthy adults is extremely low (around 1%), based on studies using PET/CT for screening.
- Imaging without clear clinical indication is likely to identify harmless findings that lead to more tests, biopsy or unnecessary surgery.

2 Don't perform routine annual stress testing after coronary artery revascularization.

- Routine annual stress testing in patients without symptoms does not usually change management.
- This practice may lead to unnecessary testing without any proven impact on patient management.

3 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.

4 Avoid using a computed tomography angiogram to diagnose pulmonary embolism in young 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 to the breast than can CTA, even when performed with a breast shield.

5 Don't use PET imaging in the evaluation of patients with dementia unless the patient has been assessed by a specialist in this field.

- Without objective evidence of dementia, the potential benefit of PET is unlikely to justify the cost or radiation risk.
- Dementia subtypes have overlapping patterns in PET imaging. Clinical evaluation and imaging often provide additive information and should be assessed together to make a reliable diagnosis and to plan care.
- For β-amyloid PET imaging, it is not currently known what a positive PET result in a cognitively normal person means; this method is not established for an individual prediction.

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How This List Was Created

The president of the Society of Nuclear Medicine and Molecular Imaging (SNMMI) appointed a Steering Committee, led by the president-elect, to develop the "Top 5" list. This committee solicited input from five SNMMI clinical specialty councils (cardiovascular, brain, nuclear oncology, general nuclear medicine, pediatric) and our PET Center of Excellence. A task force made up of the Steering Committee and specialty council/center leadership convened, and its members also provided recommendations. The Steering Committee reviewed and ranked the submissions and presented the five highest-ranked statements to the SNMMI Board of Directors and House of Delegates.

SNMMI's disclosure and conflict of interest policy can be obtained by contacting the organization (email@snmmi.org).

Sources

1

Lee JW, Kang KW, Paeng JC, Lee SM, Jang SJ, Chung JK, Lee MC, Lee DS. Cancer screening using 18F-FDG PET/CT in Korean asymptomatic volunteers: a preliminary report. Ann Nucl Med [Internet]. 2009 Sep [cited 2012 Oct 19];23(7):685-91.

Minamimoto R, Senda M, Terauchi T, Jinnouchi S, Inoue T, Iinuma T, Inoue T, Ito K, Iwata H, Uno K, Oku S, Oguchi K, Tsukamoto E, Nakashima R, Nishizawa S, Fukuda H, Murano T, Yoshida T. Analysis of various malignant neoplasms detected by FDG-PET cancer screening program: based on a Japanese Nationwide Survey. Ann Nucl Med [Internet]. 2011 Jan[cited 2012 Oct 19] ;25(1):45-54.

2

Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, Pohost GM, Williams KA. 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 [Internet]. 2009 Feb[cited 2012 Oct 19] ;53:2201–29.

3

Welker MJ, Orlov D. Thyroid Nodules. Am Fam Physician [Internet]. 2003 Feb 1 [cited 2012 Oct 19]; 67(3):559-567.

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, American Thyroid Association (ATA) Guidelines Taskforce on Thyroid Nodules and Differentiated Thyroid Cancer. Revised American Thyroid Association Management Guidelines for Patients with Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid [Internet]. 2009 Nov[cited 2012 Oct 19];19(11):1167-214.

Lee JC, Harris AM, Khafagiminimum FA. Thyroid Scans. Aust Fam Physician [Internet]. 2012 [cited 2012 Oct 19];41(8): 586.

4

International Commission on Radiological Protection. Radiation dose to patients from radiopharmaceuticals (Addendum to ICRP Publication 53). ICRP Publication 80. 1998. Ann. ICRP 28 (3). McCollough CH, Primak AN, Braun N, Kofler J, Yu L, Christner J. Strategies for reducing radiation dose in CT. Radiol Clin North Am [Internet]. 2009 Jan[cited 2012 Oct 19] ;47:27-40.

McCollough CH, Primak AH, Braun N, Kofler J, Yu L, Christner J. Strategies for reducing radiation dose in CT. Radiol Clin North Am. 2009;47:27-40.

Hurwitz LM, Yoshizumi TT, Goodman PC, Nelson RC, Toncheva G, Nguyen GB, Lowry C, Anderson-Evans C. 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 [Internet]. 2009 Jan [cited 2012 Oct 19];192(1):244-53.

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 [Internet]. 2010 Feb[cited 2012 Oct 19];194:392-397.

Parker MS, Hui FK, Camacho MA, Chung JK, Broga DW, Sethi NN. Female breast radiation exposure during CT pulmonary angiography. AJR Am J Roentgenol [Internet]. 2005 Nov [cited 2012 Oct 19];185:1228-1233.

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 [Internet]. 2010 Nov[cited 2012 Oct 19];1:361-372.

Freeman LM, Haramati LB. V/Q scintigraphy: alive, well and equal to the challenge of CT angiography. Eur J Nucl Med Mol [Internet]. Imaging. 2009 Mar [cited 2012 Oct 19];36:499-504.

Brenner DJ, Hall EJ. Computed tomography—an increasing source of radiation exposure. N Engl J Med [Internet]. 2007 Nov 29 [cited 2012 Oct 19];357:2277-2284.

Freeman LM, Stein EG, Spraregen S, Chamarthy M, Haramati LB. The current and continuing role of ventilation-perfusion scintigraphy in evaluating patients with suspected pulmonary embolism. Semin Nucl Med [Internet]. 2008 Nov [cited 2012 Oct 19]. 38(6):432-440.

Burns SK, Haramati LB. Diagnostic imaging and risk stratification of patients with acute pulmonary embolism. Cardiol Rev [Internet]. 2012 Jan-Feb[cited 2012 Oct 19];20(1):15-24.

5

Herholz K, Carter SF, Jones M. Positron emission tomography imaging in dementia. Br J Radiol [Internet]. 2007 Dec [cited 2012 Oct 19]; 80:S160-7.

Drzezga A. Amyloid-plaque imaging in early and differential diagnosis of dementia. Ann Nucl Med [Internet]. 2010 Feb [cited 2012 Oct 19];24:55-66.

Drzezga, A. Basic pathologies of neurodegenerative dementias and their relevance for state-of-the-art molecular imaging studies. Eur J Nucl Med Mol Imaging [Internet]. 2008 Mar [cited 2012 Oct 19] ;35 (Suppl 1):S4-S11.

Schroeter ML, Raczka K, Neumann J, Yves von Cramon D. Towards a nosology for frontotemporal lobar degenerations-a meta-analysis involving 267 subjects. Neuroimage [Internet]. 2007 Jul 1 [cited 2012 Oct 19];36(3):497-510.

Vlassenko AG, Mintun MA, Xiong C, Sheline YI, Goate AM, Benzinger TL, Morris JC. Amyloid-beta plaque growth in cognitively normal adults: longitudinal [11C]Pittsburgh compound B data. Ann Neurol [Internet]. 2011 Nov [cited 2012 Oct 19];70(5):857-61.

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The mission of the ABIM Foundation is to advance medical professionalism to improve the health care system. We achieve this by collaborating with physicians and physician leaders, medical trainees, health care delivery systems, payers, policymakers, consumer organizations and patients to foster a shared understanding of professionalism and how they can adopt the tenets of professionalism in practice.

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About the Society of Nuclear Medicine and Molecular Imaging

The Society of Nuclear Medicine and Molecular Imaging (SNMMI) is a nonprofit scientific and professional organization dedicated to the science, technology and practical application of nuclear medicine and molecular imaging, with the ultimate goal of improving human health. Founded in 1960, SNMMI represents more than 19,000 nuclear medicine and molecular imaging professionals worldwide.

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For more information about nuclear medicine and molecular imaging, please visit SNMMI's consumer website, www.discoverMI.org.

For more information or to see other lists of Five Things Physicians and Patients Should Question, visit www.choosingwisely.org.