

# The Choosing Wisely Campaign and Its Potential Impact on Diagnostic Radiation Burden

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Imaging utilization grew dramatically from the late 1990s through the mid-2000s, in large part because of increased access to multidetector CT and its transformative impact on medical diagnosis. The past 5 to 10 years, however, have seen more tempered growth in imaging utilization, along with an acutely increased awareness of its associated radiation burden [1,2]. This increased scrutiny has resulted in several strategies to reduce the overall diagnostic radiation burden to the population [3,4], including exposure reduction through protocol optimization (eg, ACR dose registry efforts), exposure avoidance through conventional utilization management (eg, provider decision support software), and innovative public relations initiatives such as the ACR's Image Gently<sup>®</sup> and Image Wisely<sup>®</sup> campaigns.

Early this year, a consortium of 9 medical professional societies, led by the American Board of Internal Medicine Foundation, followed in the ACR's footsteps and created Choosing Wisely<sup>®</sup>, a campaign to publicize a series of 9 "top 5" lists of situations in which diagnostic tests are routinely overordered [5]. The campaign was focused on "encouraging physicians, patients and other health care stakeholders to think and talk about medical tests and procedures that may be unnecessary and in some instances can cause harm." Yet despite its intentionally broad scope, 56% (25 of 45) of the top 5 list items involve medical imaging. Even when one excludes the recommendations of the imaging professional societies (the ACR and the American Society of

Nuclear Cardiology), 43% (15 of 35) of the remaining scenarios involve imaging. These observations highlight what most radiologists know already: that imaging is widely viewed as the single most important form of overutilized medical testing.

The issue of medical exposure to ionizing radiation and its associated public health risks also seems to have influenced the Choosing Wisely recommendations. Approximately 85% (21 of 25) of the imaging-related recommendations are focused specifically on tests that use ionizing radiation (eg, CT), and 8 of the recommendations explicitly cite radiation exposure as a negative aspect of the procedure in question. As a result, Choosing Wisely has the potential not only to reduce medical costs but also to decrease the overall population radiation burden. For example, Table 1 lists the imaging studies identified in Choosing Wisely and the corresponding estimated radiation dose level associated with each procedure [6]. It is important to realize that for even the highest dose examination (PET/CT), the associated risk for radiation-induced fatal cancer is so small (roughly 0.125%) that it would be virtually impossible for referring physicians to factor it into their decision-making processes. Furthermore, these risks are becoming smaller over time as dose reduction technologies continue to advance (eg, state-of-the-art cardiac CT angiographic protocols can have doses as low as 4 mSv, equivalent to 1.3 years of exposure to background radiation and a relative

radiation level of 3) [7]. However, we have provided the figures in Table 1 to illustrate the reduction in radiation burden that may result as an ancillary benefit of the Choosing Wisely campaign. For example, according to the currently accepted linear no-threshold models, approximately 1 fatal cancer can be avoided for every 2,000 abdominal CT scans avoided. Thus, if Choosing Wisely is successful and dissuades only nonindicated examinations, it may save lives in addition to money.

Perhaps most important, campaigns such as Choosing Wisely provide us with the opportunity to reassert ourselves as imaging gatekeepers. It is common to be confronted with requests for unwarranted imaging. However, given the increasing time demands on our specialty and referring clinicians' expectations for immediacy, it is often difficult to devote the (unreimbursed) time necessary to dissuade these requests. For the tests in question, Choosing Wisely favorably alters the landscape by providing an easily accessible source to reference in our interactions with uninformed or misguided providers. Although imaging appropriateness recommendations are nothing new, Choosing Wisely is unique in that it has buy-in from such a broad group of specialty societies. Even more exciting is the fact that the second phase of Choosing Wisely is currently under way and will reportedly feature recommendations from 13 new specialties in addition to the original 9, making a total of 22 top-5 lists comprising 110

**Table 1.** List of imaging studies identified in Choosing Wisely and corresponding radiation dose estimates and relative radiation levels

Imaging Study	Effective Dose (mSv)	Background Radiation Level	Item Number and Professional Society Recommending [5]	RRL [7]*
CXR	0.1	10 d	3 (ACR) 5 (ACP)	1
DEXA	0.001	3 h	3 (AAFP)	1
MRI lumbar spine	0	None	1 (AAFP)	0
CT head	2	8 mo	1 (ACR) 3 (ACP) 2 (AAAAI)	3
CT pulmonary embolism	15	5 y	2 (ACR)	4
CT angiography (cardiac)	12	4 y	3 (ACC) 2, 4, 5 (ASNC)	4
CT abdomen-pelvis	10	3 y	5 (AGA) 4, 5 (ACR) 2 (ACP)	4
CT colonoscopy	10	3 y	2, 3 (AGA)	4
Cardiac stress test	9.4	3 y	2, 3 (ACC)	3
Bone scan	7	2.3 y	3, 4 (ASCO) 1, 3 (ASNC) 2 (ACC)	3
PET/CT	25	8.4 y	2, 3, 4 (ASCO)	4
PCI	15	3.7 y	5 (ACC)	4
Echocardiography	None	None	4 (ACC)	0
Pelvic ultrasound	None	None	5 (ACR)	0
Lumbar spine MRI	None	None	1 (AAFP) 2 (ACP)	0

Note: AAAAI = American Academy of Allergy, Asthma and Immunology; AAFP = American Academy of Family Physicians; ACC = American College of Cardiology; ACP = American College of Physicians; AGA = American Gastroenterological Association; ASCO = American Society of Clinical Oncology; ASNC = American Society of Nuclear Cardiology; CXR = chest x-ray; DEXA = dual-energy x-ray absorptiometry; PCI = percutaneous coronary intervention; RRL = relative radiation level.

\*RRL designations assigned as 0 to 5 as follows: 0 = no radiation; 1 = <0.1 mSv, 2 = 0.1 to 1 mSv, 3 = 1 to 10 mSv, 4 = 10 to 30 mSv, 5 = 30 to 100 mSv.

individual recommendations. Radiologists would do well to stay informed as more imaging tests are added to the Choosing Wisely recommendations, so that they can keep a watchful eye for evidence of overutilization among their referral bases.

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