Patient and Health Care Provider Discussions About the Risks of Medical Imaging: Not Ready for Prime Time

Data about the risks of ionizing radiation and the risks from incidental radiological findings leading to additional workup continue to emerge.\textsuperscript{1-4} This has led commentators to propose methods to best communicate benefits and risks of medical imaging procedures to patients.\textsuperscript{5,6} We conducted a survey of ordering health care providers (hereinafter, providers) to assess their current practices and attitudes toward these discussions.

Methods. We sent an e-mail questionnaire to providers associated with a large, public medical school. Providers included fourth-year medical students, attending physicians, and house staff from internal medicine, emergency medicine (EM), radiology, cardiology, and pulmonary services. The electronic questionnaire (eAppendix; http://www.archinternmed.com) included items about demographics, the amount of previous formal training in radiation safety, attitudes toward discussing the risks of medical imaging with patients, the frequency of these discussions with patients, and the potential barriers to discussion. The institutional review board approved the study.

Groups were compared using $\chi^2$ tests for categorical data and $t$ tests or Wilcoxon rank sum tests for continuous data as appropriate. $P < .05$ was considered statistically significant.

Results. Of 849 providers invited to participate, 348 completed at least part of the survey for a 41% response rate. Of 301 respondents, 63 (21%) reported receiving no formal instruction about radiation exposure risks, while 168 (56%) reported receiving between 0.5 to 2 hours, and 53 (18%), greater than 3 hours.

Providers infrequently educated patients about radiation risks when ordering tests. Of 300 respondents, 212 (71%) reported educating patients 25% of the time or less about radiation risks when ordering computed tomographic (CT) scans. Of all provider types, medical students and EM residents (18 of 33 [55%]) who reported discussing radiation risks with patients more than half of the time when ordering CT scans. Having greater than 3 hours of formal instruction in radiation safety did not correlate with a higher likelihood of discussing radiation risks with patients when ordering CT scans ($P = .27$). In addition, 167 of 299 providers (56%) never mentioned to patients the possibility of incidental findings and the risks of subsequent workup when ordering a CT scan (Figure).

Of 300 respondents, 81 (27%) agreed that they felt comfortable educating patients about the risks of ionizing radiation from medical imaging, while 158 (53%) disagreed. Among provider types, only radiology attending physicians and EM attending physicians had a higher proportion of providers agree (10 radiologists and 17 EM physicians) than disagree (2 radiologists and 13 physicians) that they felt comfortable educating patients about the risks. Only providers who reported receiving greater than or equal to 3 hours of formal radiation safety training had a higher proportion of providers agree (30 providers) than disagree (14 providers) that they felt comfortable educating patients about the risks ($P = .001$). Finally, 125 of 298 providers (42%) believed that time limitations frequently prevented them from adequately educating patients about radiation risks from medical tests, and only 84 of 299 (28%) agreed that informed consent should be obtained when ordering CT scans.

Comment. As the use of imaging tests has increased, discussion about how to communicate the potential risks of medical testing with patients has intensified.\textsuperscript{5,6} Providers may be in the best position to have a balanced benefit-risk discussion with their patients when they are ordering a medical diagnostic study.\textsuperscript{5,6} However, our study suggests that these providers are not regularly having these discussions.
Factors that may influence the likelihood that a provider will have this discussion include their understanding of the risks of medical imaging, the amount of time that is available with the patient prior to ordering a test, concerns related to prior false-negative imaging examination findings, and unfavorable outcomes related to a past approach to an incidentaloma. We found that most frontline providers in our study had very little training in the potential radiation risks from medical imaging and that these providers felt uncomfortable discussing the risks with patients. Alternatively, providers who feel comfortable may choose not to discuss the risks with patients for other reasons, such as relatively small perceived risk compared with the perceived benefits or time limitations. As further dialogue ensues about how to communicate with patients about the risks of medical testing, consideration should be given to the infrequency of these discussions in current practice. Future studies should investigate other potential reasons that providers are not engaging in these discussions and evaluate interventions to increase the frequency and efficacy of these discussions.

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DMAA as a Dietary Supplement Ingredient

The pharmaceutical amphetamine derivative 1,3-dimethylamylamine (DMAA) was introduced in 1948 as a nasal inhaler for rhinitis by Eli Lilly & Co. By the 1970s, it had been withdrawn as an approved pharmaceutical. Surprisingly, DMAA is currently used as an ingredient in roughly 200 sports supplements, many sold in major franchises throughout the United States, with sales topping $100 million in 2010 alone (Table).1-4

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For DMAA to be legally sold as a dietary supplement, it must be a naturally occurring substance with a documented history of use prior to 1994. Remarkably, the evidence to support the sale of DMAA-containing supplements hinges on a single study.2 In this 1 study, published in the now defunct Journal of the Guizhou Institute of Technology, geranium oil (extracted from the fresh leaves and stems of Pelargonium graveolens) was found to contain less than 0.7% DMAA based on a gas chromatography and mass spectrometry analysis. The researchers do not describe their methodology but presumably based their conclusions on matching an unknown peak spectrum of geranium oil with the library mass spectrum of DMAA. The appropriate confirmatory test, using a standardized preparation of DMAA to confirm its presence, was not described.

Since the publication of this study, more than a half-dozen peer-reviewed reports have been unable to confirm this finding.6 Health Canada, for one, has concluded that “there is no credible scientific evidence that DMAA is captured as an isolate of a plant.”6 This lack of evidence has not deterred multiple supplement companies from marketing DMAA as if it were isolated from geranium. For example, the popular Jack3d product (USPlabs) sold at GNC (General Nutrition Centers) is labeled as containing “1,3-dimethylamylamine (Geranium [Stem])” (label available from the author on request).