Previous Presentation: These data were presented as a poster at the North American Primary Research Group meeting; November 21, 2011; Banff, Alberta, Canada.
Online-Only Material: The eTable and eFigures are available at http://www.jamainternalmed.com.

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EDITOR'S NOTE

Considering Baseline Risk When Prescribing Pharmacologic Treatment

Physicians do not follow clinical guidelines for many reasons. One common reason is that the guidelines may be complicated and hard to remember at point of care. The findings from this survey of physicians are consistent with that possibility. Physicians reported that they would prescribe statins to people at such low risk that our professional guidelines do not suggest treating them with medications. Certainly, this survey reflects my clinical experience. I commonly see women in my practice who have Framingham risk scores well below 10%, yet were prescribed a statin for a cholesterol level around 200 mg/dL; these women are experiencing muscle aches and pains related to the statins and are worried about an imminent myocardial infarction. One solution may be readily available: robust decision aids to make it easy for physicians to calculate risk and appropriately prescribe statins. Until then, this survey reminds us to consider baseline risk when considering whether to initiate pharmacologic treatment.

Rita F. Redberg, MD, MSc

RESEARCH LETTER

Weighing the Potential Harms of Computed Tomography: Patient Survey

Up to 1 in 3 imaging tests in the United States are ordered in situations when the expected benefits do not sufficiently exceed the risks.[1] Unfortunately, studies suggest that clinicians are not well informed about the risks of medical imaging.[2,3] Efforts to improve the risk communication skills of clinicians are a strategy to reduce imaging overuse (imaging that is inappropriate or discretionary). When patients are fully informed, they often opt for fewer tests and less aggressive care.[4] However, the impact of current risk communication practices on patient knowledge is not well understood.

We undertook a survey to understand the frequency of risk communication discussions prior to undergoing computed tomography (CT) and how these discussions informed patients of potential scanning harms.

Methods. We gave a self-administered questionnaire to 286 consecutive patients undergoing outpatient CT at the Denver Veterans Affairs Medical Center (VAMC) from November through December 2011. Respondents answered questions within the following 4 domains: (1) demographics, (2) presence of risk communication, (3) preference for more information, and (4) knowledge of potential harms.

We assessed knowledge with a free-response question asking about general harms of CT. Respondents also gave a subjective ranking of the radiation exposure associated with chest radiography (CXR), magnetic resonance imaging (MRI), CT, and living 1 year in Colorado.

We defined 2 groups to help assess basic knowledge as an outcome variable: (1) those who knew that a CT scan is associated with a higher exposure to radiation than CXR and (2) those who did not know that a CT scan is associated with a higher exposure to radiation than CXR. To understand the effect that risk communication had on this basic knowledge, 2 additional groups were defined: (1) those who reported having a discussion of both the risks and benefits of undergoing the CT scan and (2) those who did not report having a discussion of both the risks and benefits of undergoing the CT scan. Analyses were performed using Epi Info statistical software (version 7; Centers for Disease Control and Prevention). Associations between groups were analyzed using the Pearson χ^2 test, with $P < .05$ considered statistically significant.

Results. Of 286 invited individuals, 271 completed the survey (94.8% response rate). Most of the respondents were older than 50 years (86%) and male (92%). Twenty-seven percent had a high school education or less, and 92% had undergone at least 1 previous scan, with 38% reporting more than 5 previous scans (see eTable for patient characteristics [http://www.jamainternalmed.com]).

See Editor's Note at end of letter

A majority of respondents (62%) believed that the final decision to undergo CT was mainly the physician's. A minority (35%) said they discussed the potential risks of the test with their health care provider. Only 17% (n=46) reported all of the following prior to undergoing the CT scan: having a shared final decision, discussing the potential benefits, and discussing the potential risks with their health care provider.

Table. Knowledge of the Potential Harms of Computed Tomography (CT)

Question	Proportion of Respondents, No. (%) (N = 271)
Basic knowledge[a]	
Ranked CT as having no radiation exposure	14 (5)
Ranked CT as a higher radiation exposure than CXR	101 (37)
Ranked CT as a higher radiation exposure than living 1 year in Colorado	143 (53)
Ranked CT as the highest exposure among all choices[a]	38 (14)
Correctly ranked the relative amounts of exposure[a]	1 (0.4)
"To the best of your knowledge, what are the risks of having this CT scan done?"[b]	
Nonresponders	31 (11)
Do not know	51 (24)
Low[c]	65 (24)
Benefits outweigh the risk	12 (4)
Radiation	90 (24)
Cancer	13 (5)
Reaction to iodinated contrast	7 (3)
Incidental findings	0
Other[d]	6 (2)

Abbreviation: CXR, chest radiography.

[a] Using a Likert scale (range, 0-10, with 0 = no radiation and 10 = high radiation), participants gave a subjective value to the amount of radiation associated with a CT scan, living 1 year in Colorado, a chest radiograph, and a magnetic resonance image.

[b] This was a free-response question. The numbers add up to more than 240 responders because some respondents mentioned more than 1 risk.

[c] The low category is composed of answers such as: small, very little, minimal, or none.

[d] There were 6 "other" responses: (1) "drop in blood pressure"; (2) "losing my hair"; (3) "loss of more memory"; (4) "infection, bleeding"; (5) "kill good cells"; and (6) "possible weakening of the bones; tissue burning/scarring."

Responses to the knowledge questions are given in the **Table**. Thirty-seven percent knew that CT was associated with more radiation than CXR. Those who reported discussing both risks and benefits with their health care provider were no more likely to know that CT was associated with more radiation than CXR than were respondents not reporting a risk-benefit discussion. ($P = .60$)—a result that did not change with adjustment for age, education, sex, number of previous scans, or ordering clinician in multivariate analysis.

Comment. Our study indicates that most decisions to undergo outpatient CT are made by physicians and risk communication is infrequent. The risk communication that took place had limited impact: respondents who recalled discussing the benefits and risks of imaging did not have better knowledge.

A minority of patients could state potential harms from the test. No respondents mentioned downstream consequences of incidental findings as a potential harm. Because the risk of developing cancer from the radiation associated with a single CT scan has led to calls for mandatory informed consent,[5] we asked specific questions about radiation. Less than half of the respondents knew that CT was associated with more radiation exposure than CXR.

Our findings are limited by the fact that this was a single center study in an older, male VAMC population. Findings in this population may not generalize to other populations. Nonetheless, our findings are in line with findings from several previous patient surveys in non-VAMC populations demonstrating poor patient knowledge of radiation risks and limited shared decision making.[3,6-8]

We believe it is problematic when the potential harms of CT are not adequately conveyed. Ignoring downsides can lead to imbalanced decision making in favor of overuse. Organizations seeking to reduce scanning overuse and also address underuse will likely consider order entry decision support[9] among other methods. Correcting the lack of knowledge and the lack of communication about the potential harms of imaging tests—thereby enhancing shared decision making—should be part of any attempt to curb imaging overuse. It is time to begin empirically testing risk communication methods and translate these methods into routine clinical practice.

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EDITOR'S NOTE

Time to Unveil the Risk of Imaging to Patients

Despite the increased attention to the radiation risks of computed tomographic scans, this Research Letter by Caverly et al illustrates that most patients who are undergoing imaging tests are not aware of the associated risks of radiation exposure. It is likely that many physicians also do not know the risks, and so it is not surprising that even when there are discussions with patients about risks and benefits of the procedure, patients clearly still do not understand the true risk of radiation exposure. If we are to achieve optimal shared decision making on the decision to undergo imaging studies, much work needs to be done in educating physicians on the magnitude of radiation used for commonly used computed tomographic scans and the risks of radiation exposure so that we can unveil the true risk of imaging radiation exposure to our patients. This information, presented in a way that assures patient understanding of the risks, should be part of every discussion surrounding the decision to image.

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RESEARCH LETTERS

Benefits of Participation in Diabetes Group Visits After Trial Completion

Group medical clinics (GMCs) represent a potentially scalable and sustainable intervention for patients with diabetes.[1] A recent trial randomized 239 patients with uncontrolled diabetes (hemoglobin A_{1c} [HbA_{1c}] level ≥7.5%) and hypertension (blood pressure [BP] ≥140/90 mm Hg) to GMC attendance every 2 months for a year or usual care. Each session included group education and structured group interactions moderated by a registered nurse or certified diabetes educator. Individual medication adjustments were made by a pharmacist and general internist to manage HbA_{1c}, BP, and cholesterol.[2]

Group medical clinic patients had greater reductions in systolic BP (SBP) (−7.3 mm Hg)[2] and low-density lipoprotein cholesterol (LDL-C) levels (−9.2 mg/dL)[3] than usual care patients. The purpose of this Research Letter was to examine the economic and clinical benefits of GMC attendance 18 months following completion of the trial.

Methods. Expenditure and utilization outcomes were obtained from Department of Veterans Affairs (VA) claims data,[4,5] and expenditures were inflation adjusted to 2010 dollars. Outpatient expenditures, total expenditures, and probability of inpatient admission during seven 6-month periods (2 prior to, 2 during, and 3 after the trial) were modeled using generalized estimating equations. These models included treatment arm, indicators for each 6-month period, and interactions of treatment and period for the five 6-month periods following intervention initiation.

Systolic BP, LDL-C, and HbA_{1c} measurements were ascertained from the VA electronic health record taken during any outpatient visit in the 42-month observation period. Unlike study-specific outcome values obtained at baseline, 6 months, and 12 months during the trial, each patient in this follow-up study had a varying number of clinic-based outcomes that were captured at different time intervals. There were natural transition points at baseline and trial conclusion, so piecewise quadratic mixed-effects models were fit with treatment by time interactions for differential trends by arm. These models had separate quadratic functions for the trial and posttrial periods, with time coded continuously as the number of weeks from baseline and centered at the points of discontinuity (baseline and trial conclusion).[6] The models for SBP and LDL-C included patient-level random effects for intercept and linear slope, quadratic time slope, and correlations between intercept and slopes. The model for HbA_{1c} included patient-level random effects for intercept and linear time and their correlation.

The GMC trial[2] was approved by the institutional review boards of the Durham, North Carolina, and Richmond, Virginia, Veterans Affairs Medical Centers (VAMCs). The follow-up study reported herein was approved by the Durham VAMC institutional review board.