standard for compounded pills.[4] Variation in storage time did not explain potency differences.

Comment. The cholecalciferol content of OTC and compounded vitamins was highly variable; potency ranged from 9% to 146%. In our test, just over one-half of OTC pills and only one-third of compounded pills met USP Convention standards. The manufacturer that was USP verified (No. 4) was generally more accurate and less variable. Lack of accuracy in cholecalciferol dosing may not cause harm in most consumers. However, supplementation may be less effective and dose adjustments inaccurate in inconsistent users,[6] which may harm women with severe vitamin D deficiency. Pill variability may also threaten validity of vitamin D trials that use compounded pills to blind participants. As more people take vitamin D supplements, it is critical that health care providers and patients understand that cholecalciferol potency may vary widely. Products that are USP verified may have better accuracy but may be sparsely distributed. On the basis of our study, we agree with a recent editorial calling for increased regulation of dietary supplements.[7]

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Less Is More

A National Survey of the Treatment of Hyperlipidemia in Primary Prevention

The majority of statin use in the United States is for primary prevention: that is, in patients without established coronary heart disease (CHD). The evidence of mortality benefit in this population is inconclusive.[1,2] The patient's baseline risk is critical in determining the risk-benefit ratio of statins.[3]

Little is known about physician decision making regarding the use of statins in primary prevention. Previous studies investigating treatment of hyperlipidemia focused on adherence to various guidelines.[4,5] We investigated physicians' prescribing strategies in relationship to baseline risk of CHD.

Methods. We sent an anonymous and voluntary written survey to 750 physicians selected randomly from a nationally representative sample of US physicians from the American Medical Association Physician Masterfile. The sample consisted of an equal number of family medicine, cardiology, and general internal medicine physicians. Inclusion criteria were physicians (doctor of medicine or doctor of osteopathic medicine degree) who had seen adult patients with hyperlipidemia in an outpatient clinic within the last 12 months. Three waves of letters were sent with an initial $2 cash incentive.

See Editor's Note at end of letter

The survey contained 6 vignette-style questions involving patients without CHD and different baseline risks, for whom a physician might consider treatment of hyperlipidemia (**Table**). All risk factors were stated, and for all patients, the high-density lipoprotein cholesterol level was 50 mg/dL (to convert cholesterol to millimoles per liter, multiply by 0.0259) and triglyceride level was 150 mg/dL (to convert to millimoles per liter, multiply by 0.0113). Vignettes 3 to 6 describe patients who had attempted lifestyle modifications prior to consideration of medications. Vignettes 3 and 4 queried how many similar patients would need to be treated with a statin to prevent a death at 5 and 20 years and given choices of 1 to 10, 11 to 20, 21 to 50, 51 to 100, 101 to 500, and 501 or more.

All analyses were conducted on fully deidentified data using IBM SPSS Statistics 19 software (SPSS Inc). A logistic regression was run for prescribing vs not prescribing with specialty and sex as independent variables. Inclusion of other physician demographic factors did not substantially affect the model. A linear regression model was fitted for number needed to treat, with specialty and sex as independent variables. We compared prescribing

Table. Vignette Characteristics and Responses

Characteristic	Case No. 1	2	3	4	5	6
Sex	Female	Female	Male	Female	Male	Female
Age, y	55	55	40	50	75	50
Diabetic	Yes	Yes	No	No	No	No
LDL-C, mg/dL	88	120	180	180	140	145
TG, mg/dL	150	150	150	150	150	150
HDL-C, mg/dL	50	50	50	50	50	50
Risk factors	None	None	HTN	None	HTN, tobacco	HTN, tobacco
Responses, No.	199	201	197	196	201	198
Prescribe, %	40.2	94.0	88.8	73.5	86.6	88.9

Abbreviations: HDL-C, high-density lipoprotein cholesterol; HTN, hypertension; LDL-C, low-density lipoprotein cholesterol; TG, triglycerides.
SI conversion factors: To convert to millimoles per liter, multiply by 0.0259 for cholesterol and by 0.0113 for TG.

for vignette 1 vs 2, 3 vs 4, and 5 vs 6 using the McNemar test. The study was approved by the University of Michigan institutional review board.

Results. Of 750 surveys, 289 were returned, with 202 usable and meeting inclusion criteria. There were 90 family medicine (44.6%), 59 cardiology (29.2%), and 53 (26.2%) internal medicine responses. Eighty-seven surveys were unusable, of which 22 were returned to sender unopened, 7 did not meet eligibility criteria, and 58 were returned incomplete. The usable return rate was 30.5% (202 of 663). For respondent demographics please see the eTable (http://www.jamainternalmed.com).

In vignettes 1 and 2, a diabetic woman with different low-density lipoprotein cholesterol (LDL-C) levels (120 vs 88 mg/dL) was recommended a statin therapy more often in the patient with the higher LDL-C level (94.0% vs 40.2%) ($P < .001$).

In vignettes 3 and 4 involving low-risk patients with an LDL-C level of 180 mg/dL, significantly more health care providers treated the 40-year-old man with well-controlled hypertension (88.9%) compared with the 50-year-old women (73.5%) ($P < .001$). The number needed to treat (NNT) was identified as being lower in the man compared with the woman at both 5 and 20 years ($P < .001$). Health care providers reported a significantly lower perceived NNT for outcomes at 20 years compared with 5 years in both the male and female patient ($P < .001$). Distributions of NNT responses are shown in eFigure 1 and eFigure 2.

In vignettes 5 and 6, a 75-year-old man (LDL-C level of 140 mg/dL) was compared with a 50-year-old woman (LDL-C level of 145 mg/dL). Both patients had hypertension and used tobacco. Respondents recommended similar treatment rates (86.6% vs 88.9%).

We compared responses by clinical specialty, but there were no consistent differences.

Comment. Our study investigated physician prescribing intentions and outcome improvement beliefs regarding the use of statins in the treatment of hyperlipidemia in primary prevention of CHD. This study was unique because we did not compare management with current guidelines but instead asked physicians to make choices regarding treatment and their perception of effect on patient outcomes for clinical scenarios. We found that physicians consider medication for patients (vignettes 3, 4, and 6) with low Framingham risk scores (≤5%), for whom available evidence does not support outcome benefit.[1,6] Seventy-three percent of respondents even recommended treating a 50-year-old woman with an LDL-C level of 180 mg/dL, though one-fourth of those practitioners identified an NNT for mortality of more than 500 at 5 years (eFigure 2). Furthermore, though there is clear evidence that most diabetic patients benefit from statins even if their LDL-C level is below goal,[7,8] most respondents tended not to treat a diabetic patient if their LDL-C level was below the threshold set by guidelines. Overall, our study suggests that physicians may not adequately consider a patient's cardiovascular risk when prescribing statins in primary prevention.

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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.

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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.