Physician Perceptions of Choosing Wisely and Drivers of Overuse

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ABSTRACT

Objectives: Little is known regarding physicians' views on health service overuse or their awareness of the American Board of Internal Medicine Foundation's Choosing Wisely campaign. Through the Survey on Overuse and Knowledge of Choosing Wisely, we assessed physician views on hypothesized drivers of overuse and Choosing Wisely.

Study Design: We designed the survey to investigate physicians' knowledge of, awareness of, and feelings toward Choosing Wisely, along with their concerns about malpractice, perception of patient demand, discomfort with uncertainty, and cost-consciousness. Where possible, we used pre-validated survey instruments.

Methods: We distributed the survey to clinicians practicing at Atrius Health, the largest ambulatory care provider in Massachusetts. We analyzed 584 responses (72% response rate) and calculated 3 previously validated scales.

Results: Primary care physicians reported significantly greater awareness of Choosing Wisely (47.2%) than medical specialists (37.4%) and surgical specialists (27%). A majority (62%) of all respondents reported they found uncertainty involved in providing care disconcerting. Approximately one-third felt it unfair to ask physicians to be both cost-conscious and concerned with welfare, thought too much emphasis was placed on costs, and thought doctors were too busy to worry about costs. Surgical specialists were more concerned about malpractice, whereas primary care physicians reported feeling significantly more pressure from patients for tests and procedures.

Conclusions: Knowledge of Choosing Wisely is limited, but primary care physicians are more aware of the campaign than specialists. Although hypothesized drivers of overuse are prevalent, most physicians support cost-consciousness in medicine and embrace their responsibility in reducing costs.

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The overuse of healthcare services is receiving attention as physicians are increasingly asked to embrace financial stewardship and payment reform pushes provider groups to consider value. In the past, there was little agreement on classification of services as low-value and no consensus on which mechanisms were most effective in reducing the use of these low-value services.[1] Aimed at filling this gap, "Choosing Wisely" is an effort of the American Board of Internal Medicine (ABIM) Foundation to help physicians be better stewards of finite healthcare resources.[2]

Beginning in 2012, specialty societies partnered with the ABIM Foundation to create and publish lists of "Five Things Physicians and Patients Should Question"—evidence-based recommendations that should be discussed to help make wise decisions about appropriate care based on a patient's individual situation. More than 70 specialty societies have joined the campaign and published lists, but the services on the lists are chosen by representatives from specialty societies, and wide participation is often not sought in their creation.[3] This approach makes the level of awareness, acceptance, and adoption of the recommendations uncertain.

The impact of the Choosing Wisely initiative on low-value care depends on effective dissemination and uptake of the lists; understanding the drivers of overuse is also needed to inform interventions targeting these services. A suite of communication education modules is available through the ABIM Foundation to help providers engage in conversations with patients,[4] and a small library of video resources is available on the Choosing Wisely website. State medical societies, specialty societies, and regional health collaboratives are helping extend the reach of the campaign in communities, and *Consumer Reports* is developing and disseminating materials to educate patients regarding the services targeted by Choosing Wisely.

Hypothesized drivers of health services overuse include discomfort with uncertainty (around diagnosis, for example), pa-

Take-Away Points

Our analysis presents findings that can be used to inform practice and policy:

- Initiatives aimed at improving financial stewardship may benefit from efforts targeted at supporting clinicians in dealing with the uncertainty that comes with conservative management. Physicians may be more willing to forgo or delay low-value care if they have appropriate support that addresses patient demand, malpractice concerns, and other drivers of overuse.
- There is receptivity to more support for physicians to consider costs when recommending testing or treatment regimens. Ideally, decision support would be combined with information on price to address the significant knowledge gap around costs expressed in our survey.

tient demand for services, fear of malpractice, and, perhaps most importantly, financial incentives that do not support cost-consciousness.[5,6] Each of these requires a unique set of policy interventions to reduce overuse, and each may affect physicians and services in different ways. Understanding which of these factors physicians consider influential to their behavior regarding low-value services is key to the development of effective interventions.

The Choosing Wisely measures were developed by professional societies and appear to have gained credibility among a variety of stakeholders, but little is known about how widely the initiative is recognized among physicians. To maximize the influence of Choosing Wisely on the behavior of physicians, we must understand more about factors that lead to overuse of medical tests and procedures and how receptive physicians are to incorporating value-based decision making into their practice. In this paper, we report results from a survey of physicians at a large physician group practice regarding their awareness of, and feelings toward, the Choosing Wisely campaign and other hypothesized predictors of overuse, as well as their receptiveness to value-based decision making.

METHODS

Survey Collection

Atrius Health is the largest ambulatory care provider in Massachusetts, providing outpatient primary and specialty care for nearly 1 million patients. They are also a Pioneer Medicare accountable care organization with a mix of fee-for-service and capitated contracts. In January 2014, we sent a cover letter detailing the purpose of the survey and the survey instrument to all clinicians (MD or DO) practicing at Atrius Health from Atrius staff and study team members. Second and third mailings, coupled with reminder e-mails, were sent to nonresponders at 3-week intervals. We distributed the survey to 808 clinicians and received 584 responses (72% response rate) by April 2014.

Survey Instrument

The 29-item Survey on Overuse and Knowledge of Choosing Wisely was designed to investigate whether overuse is impacted by a physician's: 1) level of cost-consciousness, 2) comfort with clinical uncertainty, 3) concerns regarding malpractice, and 4) perceived pressure from patients and the healthcare system. The survey questions used for each scale are noted in Table 1. Where possible, we used validated survey instruments to examine potential determinants of overuse.

The Cost-Consciousness Scale, developed by Tilburt et al,[7] was designed to assess how cost-conscious physicians are in their day-to-day care. It was calculated as a summation of 11 survey questions, with an answer of "strongly agree" equaling 4 and an answer of "strongly disagree" equaling 1. The composite score was on a scale of 11 to 44, with 44 representing the highest reported consciousness of cost.

The Discomfort With Uncertainty Scale, originally developed by Gerrity et al,[8] sought to assess how uncomfortable physicians were in providing care for their patients when a diagnosis or follow-up care is uncertain. Previous studies have shortened the original 13-item Discomfort With Uncertainty Scale and demonstrated predictive validity with the abbreviated versions.[9] Like Tilburt et al,[7] we included 1 item from this tool to scale discomfort while decreasing redundancy for survey respondents. The response scale ranges from 1 to 4, with 4 indicating the highest level of discomfort.

The 5-item Malpractice Concerns Scale, a validated set of questions demonstrated to be associated with resource utilization,[10,11] aimed to assess day-to-day malpractice concerns of physicians using 5 survey questions. We computed the percentage of responses either "strongly" or "moderately" agreeing with the provided statement, and the percentage for each question amounted to 20% of a final Malpractice Concerns composite score on a scale of 0 to 100.

Finally, we developed several new items, including questions addressing physicians' perceived pressure from patients and the healthcare system to order tests and procedures, physicians' attitudes toward making referrals, and physicians' awareness of and views on the Choosing Wisely campaign. All questions—except for the 3 directly addressing Choosing Wisely—were presented as statements with a 4-point Likert scale, where possible responses ranged from "strongly agree" to "strongly disagree"; there was no

Table 1. Measurement of Potential Drivers of Overuse Scales, Including Comparisons to Previous Surveys

Calculated Scales	Adjusted Mean	SD	Min	Max	Mean From Literature	Adjusted Specialty Means[a]			ANOVA *P*
						Primary Care	Medical Specialties	Surgical Specialties	
Cost-Consciousness Scale[b] (11-44; 44 denotes most cost-conscious)	29.2	2.9	19	44	31.0	29.4	29.1	29.3	.6152
Malpractice Concerns Scale[c] (0-100; 100 denotes most concerned)	58.1	33.3	0	100	65.4	57.7	50.7	63.0	.016[d]
Discomfort with Uncertainty Scale[e] (1-4; 4 denotes most discomfort)	2.7	0.8	1	4	–	2.8	2.8	2.7	.245

ANOVA indicates analysis of variance.
[a]The means are adjusted for years practicing, half-sessions worked a week, and gender using linear regression and average marginal effects.
[b]The Cost-Consciousness Scale was calculated from respondents' answers to questions 1-3, 5, 7, 8, 10-13, and 15. A mean score of 31 was found in the 2013 study by Tilburt et al.[7]
[c]The Malpractice Concerns Scale was calculated from respondents' answers to questions 23-27. A mean score of 65.4 was found in the 2010 study by Carrier et al.[10]
[d]Statistically significant difference across physician specialties at $P < .05$.
[e]The Discomfort with Uncertainty Scale was calculated from respondents' answers to question 22. A majority (62%) of all respondents reported that they found the uncertainty involved in providing care disconcerting compared with 56% in previous work.[7]
Source: Survey on Overuse and Knowledge of Choosing Wisely, 2014.

neutral "neither agree nor disagree" option. Finally, 2 questions on years of practice and weekly clinical effort were included at the end of the survey (our sample included gender and specialty). Our survey instrument (see eAppendix 1 [eAppendices available at **www.ajmc.com**]) was approved by the Partners Health Care Human Studies Committee.

Respondent Characteristics

We calculated summary statistics for the Atrius population of physicians, the survey sample, and the US population of physicians. We used *z* tests of proportion to test if our sample differed significantly from national physician characteristic proportions and from that of Atrius as a whole.

Analyses

We calculated summary statistics for each survey item and each scale. We adjusted the means of each calculated scale for age, gender, and clinical effort (half-sessions worked per week) using a linear regression model and average marginal effects. For the questions about knowledge of the Choosing Wisely program, we adjusted the proportions of responses for age, gender, and half-sessions worked per week using logistic and ordinal logistic models and average marginal effects. These covariates were included because the literature has demonstrated an association between age, gender, and clinical effort with hypothesized drivers of overuse, and we wanted to control for the potential impact of these differences on perceptions of Choosing Wisely.[7-9]

We used analysis of variance (ANOVA) to determine if there were significant differences in adjusted scale results between respondents in primary care, in medical specialties, and in surgical specialties.[12,13] We used a logistic model and average marginal effects to calculate the predicted percent that agreed or strongly agreed, adjusted for years in practice, gender, and clinical effort. We tested the difference across specialties from these adjusted percentages using χ^2 tests. We used the same method to additionally determine if there was: a) a significant difference across specialties in adjusted awareness of the Choosing Wisely campaign, b) if physicians viewed the Choosing Wisely campaign as a legitimate source of guidance, and c) if the campaign had empowered respondents to reduce the use of unnecessary tests and procedures. Finally, we reported correlations between the calculated scales and awareness of Choosing Wisely and attitudes toward being a steward of resources.

RESULTS

Overall, 56% of respondents were female. Respondents reported being in practice a mean of 18.5 years and working an average of 6.6 half-day sessions of patient care (approximately 30 hours) per week; 56% were primary care physicians and the remainder practiced in medical specialties (25%) and surgical specialties (19%) (eAppendix 2). Our sample had significantly more female respondents than the national physician population ($P < .001$), yet did not differ significantly from the overall Atrius physician population ($P = .328$).

Primary care physicians reported significantly greater awareness of the Choosing Wisely campaign (47.2%) compared with medical specialists (37.4%) and surgical specialists (27.0%) ($P < .001$) (Table 2) after adjusting for age, gender, and clinical effort. When asked if they viewed the Choosing Wisely campaign as a legitimate source of

Table 2. Adjusted Choosing Wisely Awareness and Views by Specialty Classification[a,b,c]

	Are you aware of the Choosing Wisely campaign?			Do you view the Choosing Wisely campaign as a legitimate source of guidance regarding the use of unnecessary tests and procedures?				Has the Choosing Wisely campaign empowered you to reduce the use of unnecessary tests and procedures?			
Type of Physician	Yes	No	*P*	Yes, absolutely	Yes, Somewhat	No, not at all	*P*	Yes, absolutely	Yes, somewhat	No, not at all	*P*
Primary care	47.2%	52.8%		45.5%	51.5%	2.9%		17%	58.1%	24.9%	
Medical specialties	37.4%	62.6%	<.001[d]	32.8%	62.2%	5.0%	.152	11%	53.4%	35.6%	.046[d]
Surgical specialties	27%	73%		23.5%	68.7%	7.8%		7.4%	46.6%	46.0%	
Total	41%	59%		40.1%	56.0%	3.9%		14.5%	55.8%	29.7%	
N		576			230				227		

[a]The specialties included in each group are listed in eAppendix 2.
[b]Those unaware of the Choosing Wisely campaign were excluded from the follow-up questions on guidance and empowerment.
[c]All proportions are adjusted using logistic regression and average marginal effects for gender, half-sessions worked a week, and years in medical practice.
[d]Statistical significance at $P < .05$ using χ^2 tests of the average marginal effects.
Source: Survey on Overuse and Knowledge of Choosing Wisely, 2014.

guidance, similar proportions across the 3 physician specialty categories reported they agreed or somewhat agreed that Choosing Wisely was a legitimate source of guidance (97.1%, 95%, and 92.2% in primary care, medical specialties, and surgical specialties, respectively) after adjusting for the covariates. Three-fourths (75.1%) of primary care physicians reported they agreed or somewhat agreed that Choosing Wisely empowered them to reduce use of unnecessary tests and procedures compared with 64.4% of medical specialists and 54% of surgical specialists; this was statistically significant ($P = .046$)

The adjusted mean score on the Cost-Consciousness Scale was 29.2 out of a possible 44—similar to the mean of 31 found for physician populations in other studies (Table 1).[7] Awareness of the Choosing Wisely campaign correlated with greater cost-consciousness, but scoring higher on the Cost-Consciousness Scale correlated with a less positive view of the campaign as a legitimate source of guidance regarding the use of unnecessary tests and procedures (eAppendix 3).

The adjusted mean score on the Malpractice Concerns Scale across all respondents was 58.1 (on a scale of 0 to 100), which is slightly lower than the mean 65.4 found by Carrier et al (Table 1).[10] Surgeons reported the highest adjusted mean of 63.0, while primary care physicians reported a mean of 57.7 and medical specialties reported a mean of 50.7 ($P = .016$) (Table 1). Although our recorded scores are lower than those published by others, the trend of surgeons reporting the greatest malpractice concern is consistent with prior studies.[10]

For the Discomfort With Uncertainty Scale, the mean of all respondents was a 2.7 out of 4. A majority (62%) of all respondents reported that uncertainty involved in providing care was disconcerting; this compares with 56% reported by others.[7] There were no significant differences in this score between physician specialties.

After adjusting for covariates, almost all physicians agreed that doctors need to limit unnecessary tests (96.8%), have a responsibility to control costs (92.2%), and should be aware of and adhere to clinical guidelines (97.9%) (Table 3). Approximately one-third felt it unfair to ask physicians to be both cost-conscious and concerned with welfare (33.0%), thought there is too much emphasis on costs (30.7%), try not to think about costs (33.9%), and thought that doctors are too busy to worry about costs (27.8%) (Table 3); these proportions did not differ across specialties. Less than half of respondents (36.9%) reported having a firm understanding of the costs of tests and procedures to the healthcare system. Primary care physicians reported feeling significantly more pressure from patients to order tests and procedures than medical and surgical specialties (68.3%, 58.0%, 55.8%, respectively; $P = .024$) (Table 3). Primary care physicians were also significantly more likely to report feeling pressure to refer patients to consultants (65.3% vs 34.7% in the medical specialties and 33.7% in the surgical specialties; $P < .001$) and to feel that the risk of unnecessary tests is important to consider when requesting referrals (58.1% vs 27.9% in the medical specialties and 38.8% in the surgical specialties; $P < .001$).

DISCUSSION

Overall, we found knowledge of the Choosing Wisely campaign to be limited—but the campaign had been in place for less than 2 years at the time of the survey. Prior work on awareness of clinical practice guidelines showed a broad range in awareness across specialties and services

Table 3. Physician Responses: Survey on Overuse and Knowledge of Choosing Wisely, by Physician Specialty

Question	Adjusted Total	Adjusted Percentage "Somewhat Agree" or "Agree" (%)			*P*
		Primary Care	Medical Specialty	Surgical Specialty	
Doctors need to limit unnecessary tests	96.8	97.7	94.0	98.1	.186
It is unfair to ask physicians to be cost-conscious and concerned with patient welfare	33.0	31.9	33.5	35.4	.804
There is too much emphasis on costs	30.7	30.7	31.6	29.4	.933
I feel pressure from patients to order more tests and procedures	67.7	73.3	55.8	66.4	.002[a]
I should be devoted to patients' interests, even if expensive	74.5	73.8	76.8	73.8	.775
I understand the cost of tests and procedures to the health system	36.9	34.2	41.3	39.1	.325
Decision support tools would be useful	85.6	85.2	87.6	83.6	.659
I try not to think about cost during treatment decisions	33.9	35.7	32.1	30.6	.566
I feel financial pressure to order fewer tests	63.5	68.3	58.0	55.8	.024[a]
Cost is only important for out-of-pocket	7.1	8.7	6.2	3.8	.129
Doctors are too busy to worry about cost	27.8	30.5	26.8	21.0	.133
Cost to society is important in my decisions	62.7	62.2	61.2	66.4	.678
Physicians have responsibility to control costs	92.2	93.6	90.1	90.5	.367
Physicians should be aware of/adhere to clinical guidelines	97.9	98.2	96.2	99.0	.383
Physicians should adhere to guidelines that discourage interventions with small benefit but high cost	88.9	90.1	86.0	89.5	.487
Physicians across specialty are likeminded in their commitment to reducing unnecessary treatments	20.7	17.6	23.0	26.6	.125
I feel pressure from patients to refer them to consultants	52.0	65.3	34.7	33.7	<.001[a]
Risk of unnecessary tests is important in my decision to refer patients for consultation	47.1	58.1	27.9	38.8	<.001[a]
Uncertainty involved in patient care disconcerting	61.6	60.4	65.3	59.7	.553
I order tests/consultations to avoid appearance of malpractice	45.8	50.0	39.1	41.8	.066
Relying on clinical judgment over technology is becoming riskier due to malpractice concerns	75.4	77.3	65.4	82.5	.006[a]
I ask consultant opinions to avoid being sued	49.2	51.5	44.5	48.3	.387
I feel pressured by the threat of malpractice	51.3	48.7	49.2	62.6	.031
I am concerned I will be involved in a malpractice case within 10 years	69.5	66.6	64.4	85.4	<.001[a]

All reported percentages are adjusted using average marginal effects for years in practice, half sessions worked a week, and gender. *P* values are reported from χ^2 tests of the average marginal effects.
[a]Statistically significant difference across physician specialties at $P < .05$.
Source: Survey on Overuse and Knowledge of Choosing Wisely, 2014.

in line with these estimates.[14] Primary care physicians were more aware of the campaign than specialists. Further, buy-in to the campaign was mixed, but compared with others, more primary care physicians report "absolutely" viewing the campaign as a legitimate source of guidance—this proportion was still less than half, however. One in 5 primary care physicians reported the campaign has "absolutely" empowered them to reduce their use of unnecessary tests and procedures; however, only a small proportion of specialists expressed this sentiment.

Policy makers, practitioners, and researchers have hypothesized drivers of overuse,[15] and many of these factors were prevalent among our physician sample, with more than half of respondents reporting the following: pressure from patients to order tests, ordering tests to reduce risk of malpractice, finding the uncertainty involved in patient care disconcerting, and not understanding of the costs of tests and procedures to the health system. The finding that primary care physicians feel more pressure from patients for tests and procedures suggests that future

interventions may need to be specifically oriented toward primary care physicians to equip them with strategies for resisting patient pressure and helping patients to understand that more is not necessarily better. Physicians in this group were remarkably open to the concept of cost-consciousness in medicine and their responsibility in reducing costs. Moreover, most felt decision-support tools would be useful. Working toward e-consults and telemedicine should also aid primary care physicians in gaining confidence at addressing overutilization caused by feeling pressure to complete a consultation.[16] Risk of unnecessary testing as a consideration in referral decisions is in line with prior research showing that the most prevalent reason for overriding suggestions to forgo low-value care is recommendation by a specialist.[17]

Our survey is strengthened by the combination of 3 distinct validated survey tools to measure discomfort with uncertainty, cost-consciousness, and malpractice concerns with other hypothesized drivers of overuse and knowledge of a financial stewardship campaign. Although recent studies have analyzed physician awareness of and attitudes toward Choosing Wisely, as well as physician views regarding healthcare costs,[7,18] ours is the first, to our knowledge, to combine pre-validated survey instruments with questions specifically addressing the Choosing Wisely campaign. Our findings link prior literature on physician views of decision making and cost with potential cost-containment strategies informed by the Choosing Wisely effort.

Our analysis of physician attitudes toward overuse is limited, however, by the fact that we relied on providers' self-reported perceptions of Choosing Wisely and their attitudes toward overuse. We were thus unable to account for potential social desirability bias or other response biases. Atrius Health physicians also may not be representative of physicians nationwide, they may be more accustomed to initiatives that address healthcare costs. Compared with the ABIM Foundation's survey of physicians nationwide[18]; our survey respondents reported being aware of the Choosing Wisely campaign at a significantly higher rate (41% vs 21%). Our study, however, provides insights into the views of physicians practicing within a system at the frontier of payment reform and large-scale integration of care.

Although we cannot know exactly how representative our respondents are of physicians nationwide, outside of gender and specialty, most of our findings are consistent with previous physician survey studies. We found surgical specialists reported higher malpractice concern than primary care physicians, as previously demonstrated by Carrier et al.[10] Also, in our survey, women reported greater discomfort with uncertainty than men—a common trend in the literature.[8,9] These findings support the generalizable nature of our sample.

Our analysis also complements the existing literature on physician attitudes and behaviors regarding cost and low-value care while providing new insight. Prior studies identified physicians' knowledge of clinical guidelines and awareness of costs of tests and procedures as factors affecting the delivery of appropriate, cost-effective care. In these studies, the majority of primary care physicians reported either a lack of knowledge regarding guidelines or forgetting guidelines during patient encounters as barriers to adherence.[19] Similarly, clinicians report having a very limited knowledge of costs despite their insistence that cost is an important factor in their decision making.[20] Other research has uncovered the complicated trade-offs that physicians face as they strive to care for patients in a thorough yet cost-conscious manner.[15] By measuring potential causes of overuse using validated scales, our study quantifies these complex trade-offs and creates a replicable measurement tool that might be applied to a variety of clinicians and tracked over time to measure the impact of efforts aimed at behavior change.

Although widely discussed, the healthcare system has been slow to effectively discourage overuse. Patient and physician knowledge and understanding of which tests are low-value is a necessary first step to reduce overuse of services. This survey provides information on physicians' knowledge of an informational campaign to identify low-value care and finds communication to primary care physicians has been more successful than communication to specialists. Perhaps most encouragingly, physicians report being ready to consider costs in treatment decisions. Ideally, clinical decision support would be combined with readily available information on price and relative price of tests and procedures to address the significant knowledge gap around healthcare costs expressed by physicians in our survey. This may be facilitated by legislation such as the Massachusetts Medical Price Transparency Law, enacted in January 2014, which guarantees that healthcare cost information be made available to patients and physicians.[21]

Our results further suggest initiatives aimed at improving physician financial stewardship may benefit from efforts specifically aimed at supporting clinicians in dealing with the uncertainty that comes with conservative management. Physicians may be more willing to forgo or delay expensive low-value care with appropriate support that addresses patient demand, malpractice concerns, and oth-

er drivers of overuse. Patient education and shared decision-making tools may reduce perceived patient pressures to do more testing and enhance other activities. Malpractice concerns, on the other hand, require a different set of policy levers and physician protections that are only partially within the control of healthcare systems.

Future Research

Querying physicians about their views of overuse and related concepts is a useful first step for generating testable hypotheses about patterns of overuse and the effectiveness of specific policies to reduce low-value services. These data show hypothesized factors that may be barriers to high-value care, according to physicians' self-reporting. Thus, the data should inform the focus of future policies and interventions to increase the value of care. Prior analyses suggest a complicated relationship between clinicians' self-reported decision making and their behaviors; the intricacies of this association require fuller investigation. This information will allow us to determine the most effective levers to reduce overuse.

CONCLUSIONS

Reduction of overuse will require more than just engaging physicians, as the behavior of patients, regulators, and other stakeholders also contributes to the consumption of low-value services. Improving the value in the US healthcare system will require a multi-faceted approach in which all stakeholders' beliefs and objectives are taken into consideration so that incentives are aligned for the elimination of the use of low-value services across stakeholder groups.

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eAppendix 1. Survey on Overuse and Knowledge of Choosing Wisely Instrument

Section I: Costs and Utilization

These questions address your perceptions regarding health care costs and utilization. Indicate your level of agreement or disagreement with the following statements:

1. **Doctors need to take a more prominent role in limiting use of unnecessary tests**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

2. **It is unfair to ask physicians to be cost-conscious and still keep the welfare of their patients foremost in their minds**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

3. **There is currently too much emphasis on costs of tests and procedures**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

4. **I feel pressure from my patients to order more tests and procedures in my clinical practice**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

5. **I should be solely devoted to my individual patients' best interests, even if that is expensive**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

6. **I have a firm understanding of how much the tests and procedures I routinely order cost the health system**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

7. **Decision support tools that show costs would be helpful in my practice**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

8. **I try not to think about the cost to the health care system when making treatment decisions**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

9. **I feel financial pressure from the health system to order fewer tests and procedures in my clinical practice**
   - ❑ Strongly agree
   - ❑ Moderately agree
   - ❑ Moderately disagree
   - ❑ Strongly disagree

10. **The cost of a test or medication is only important if the patient has to pay for it out of pocket**
    - ❑ Strongly agree
    - ❑ Moderately agree
    - ❑ Moderately disagree
    - ❑ Strongly disagree

11. **Doctors are too busy to worry about costs of tests and procedures**
    - ❑ Strongly agree
    - ❑ Moderately agree
    - ❑ Moderately disagree
    - ❑ Strongly disagree

***** PLEASE TURN TO REVERSE SIDE FOR PAGE 2 *****

12. Cost to society is important in my decision to use or not to use an intervention

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

13. Trying to contain costs is the responsibility of every physician

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

14. Physicians should be aware of and adhere to clinical guidelines when applicable

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

15. Physicians should adhere to clinical guidelines that discourage the use of interventions that have a small proven advantage over standard interventions, but cost much more

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

16. Physicians across different specialties are like-minded in their commitment to limit the use of unnecessary tests and procedures

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

17. I feel pressure from my patients to refer to consultants in my clinical practice

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

18. The risk of generating unnecessary tests and procedures is an important factor in my decision to refer a patient for consultation.

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

The next 3 questions concern the Choosing Wisely campaign, a program initiated by the ABIM Foundation in 2012 to help physicians and their patients reduce the use of unnecessary tests and procedures. The Campaign has engaged leading physician specialty societies to produce lists of evidence-based recommendations to reduce use of unnecessary and potentially harmful health care.

19. Are you aware of the Choosing Wisely campaign?

- ❑ Yes, very aware
- ❑ Yes, somewhat aware
- ❑ No, not at all aware – ***proceed to question 22 on next page***

20. Do you view the Choosing Wisely campaign as a legitimate source of guidance regarding the use of unnecessary tests and procedures?

- ❑ Yes, absolutely
- ❑ Yes, somewhat
- ❑ No, not at all
- ❑ N/A, not aware of the campaign

***** PLEASE TURN TO PAGE 3 *****

21. Has the Choosing Wisely campaign empowered you to reduce the use of unnecessary tests and procedures?

- ❑ Yes, absolutely
- ❑ Yes, somewhat
- ❑ No, not at all

Section II: Uncertainty and Malpractice

The following questions address clinical uncertainty and malpractice concerns. Indicate your level of agreement or disagreement with the following statements:

22. I find the uncertainty involved in patient care disconcerting

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

23. I order some tests or consultations simply to avoid the appearance of malpractice.

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

24. Relying on clinical judgment rather than on technology to make a diagnosis is becoming riskier because of the threat of malpractice suits.

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

25. Sometimes I ask for consultant opinions primarily to reduce my risk of being sued.

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

26. I feel pressured in my day-to-day practice by the threat of malpractice litigation.

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

27. I am concerned that I will be involved in a malpractice case sometime in the next 10 years.

- ❑ Strongly agree
- ❑ Moderately agree
- ❑ Moderately disagree
- ❑ Strongly disagree

Section III: Your Clinical Practice

We would like to end by asking about general background information that may help us interpret survey findings.

28. In what year did you begin medical practice after completing your undergraduate and graduate medical training? (a residency or fellowship is considered graduate medical training)

___ ___ ___ ___ Year began

29. During a typical COMPLETE WEEK OF WORK, approximately how many ½ day clinical sessions do you personally see patients in the outpatient office/clinic?

_____ ½ day sessions per week

******* Thank you for completing this survey *******

eAppendix 2. Characteristics of Study Sample, Atrius Health, and National Physicians

		National Physician Population (%)	*P*	Atrius Physician Population (%)	*P*	Atrius Study Sample (%)
Gender	Female	30	<.001[a]	58	.328	56
Specialty						
Primary Care	Internal medicine	18.4	<.001[a]	35.6	.880	35.3
	Pediatrics	9.3	<.001[a]	14.3	.016[a]	17.8
	Family medicine	17.9	<.001[a]	–	–	2.9
	Total	45.7	<.001[a]	49.9	.002[a]	56
Medical Specialties	Allergy	0.7	.147	1	.627	1.2
	Cardiology	3.7	.096	2.7	.655	2.4
	Dermatology	1.8	.102	2.7	1.000	2.7
	Diag. radiology	4.7	<.001[a]	3.7	<.001[a]	0.5
	Endocrinology	1	.008[a]	2.2	.869	2.1
	Fertility	–	–	–	–	0.5
	Gastroenterology	2.2	.621	2.7	.233	1.9
	Genetics	0.7	.147	–	–	0.2
	Geriatrics	–	–	–	–	0.2
	Nephrology	1.4	.064	1	.225	0.5
	Neurology	2.2	.621	1.8	.856	1.9
	Oncology	0.8	.278	1.8	.275	1.2
	Pain medicine	–	–	–	–	0.5
	Physiatry	–	–	–	–	0.3
	Podiatry	–	–	1.3	.831	1.4
	Pulmonary	2.1	.002[a]	0.7	.246	0.3
	Rheumatology	0.8	.786	0.8	.786	0.9
	Urgent care	5.7	<.001[a]	–	–	2.1
	Behav health	6.4	.038	4.5	.816	4.3
	Total	34.3	<.001[a]	29.1	.033[a]	25.1
Surgical Specialties	Surgery	4.4	.007[a]	1	.008	2.1
	ENT	–	–	1.2	.267	0.7
	Ob/gyn	6.8	.068	8.8	.932	8.7
	Ophthal/opto	3	.202	6.7	.007[a]	3.9
	Orthopedics	3.3	.137	2.5	.642	2.2
	Spine	0.8	.642	–	.104	0.2
	Urology	1.7	.025[a]	0.8	.416	0.5
	Total	20.1	.278	21	.109	18.3

Behav, behavioral; ENT, ear, nose, throat; gyn, gynecology; Ob, obstetrics; Opthal, ophthalmology; Opto, optometry;

[a]Denotes statistically significant 2-sample *z* test of proportion ($P < .05$). The first column of *P* values tests the difference between the national physician population and the Atrius survey sample. The second column of *P* values tests the difference between the Atrius population and the Atruis survey sample.

Sources: National values are taken from the 2012 Association of American Medical Colleges Physician Specialty Data Book. Atrius physician workforce figures are from Atrius Health. Respondent characteristics derived from Survey on Overuse and Knowledge of Choosing Wisely.

eAppendix 3. Correlation of Awareness and Empowerment with Hypothesized Drivers of Overuse

	Are you aware of the Choosing Wisely campaign?		**Do you view the Choosing Wisely campaign as a legitimate source of guidance regarding the use of unnecessary tests and procedures?**		**Has the Choosing Wisely campaign empowered you to reduce the use of unnecessary tests and procedures?**	
Scale	**Spearman's Rho**	***P***	**Spearman's Rho**	***P***	**Spearman's Rho**	***P***
Cost Consciousness Scale	0.1447	.0006[a]	–0.1423	.0325[a]	0.0927	.1669
Malpractice Concern Index	–0.0007	.9875	–0.1141	.0834	–0.0013	.9844
Discomfort with Uncertainty Scale	0.0808	.0531	–0.168	.0107[a]	–0.1492	.0246[a]

[a]Represents a statistically significant Spearman's Rho test of correlation.