In conclusion, our study demonstrates that nearly one-fourth of patients with thyroid cancer may receive unnecessary RAI treatment. Ongoing efforts should be undertaken to educate health care professionals in the appropriate use of RAI therapy to optimize patient care.

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Creating a List of Low-Value Health Care Activities in Swiss Primary Care

In 2010, the idea emerged of creating lists of low-value health care activities as a way to confront rising medical costs and encourage cost-conscious care. The Good Stewardship Working Group3 and Brody2 pioneered the idea of “top 5” lists, leading to the Choosing Wisely campaign.3 Building on this momentum, there has been widespread interest in proposing additional lists.4 In 2012, the Swiss Society of General Internal Medicine committed to creating a list for Swiss ambulatory internal medicine.

Methods | A review of publications was performed using the search terms low value, disinvestment, less is more, and avoidable
Three sets of lists were identified (1103 recommendations) as of March 5, 2013. Two physicians excluded recommendations that were not relevant to ambulatory internal medicine (eg, specialized medicine, pediatrics), leading to an initial list of 38 international recommendations.

An online Delphi process was then applied, using successive electronic survey instruments placed on the SurveyMonkey website (www.surveymonkey.com). All committee members of the Swiss Society of General Internal Medicine and the Swiss Society of Family Medicine, along with professors from the divisions of General Internal Medicine and Family Medicine at the 5 Swiss university medical schools, were invited to participate as experts. A 7-member advisory committee was formed based on Swiss Society of General Internal Medicine members who expressed a specific interest in this subject.

In round 1, experts gave their level of agreement with the international recommendations using a 10-point Likert scale. Experts could also propose additional recommendations. After a review of publications to ensure their validity based on available evidence, 12 of 21 novel recommendations were retained.

In round 2, recommendations with intermediate scores in round 1 (average scores, 7-9) were reranked based on experts’ level of agreement, along with the 12 novel recommendations. For round 3, recommendations with scores greater than 9 were graded based on a 3-point Likert scale in 3 areas: frequency, agreement ranking, and committee selection.

A total of 50 recommendations were ranked during the Delphi process, including 38 existing international recommendations and 12 novel recommendations from the experts. From the top 10 recommendations of the Delphi process, an expert panel chose the final top 5 list.

### Table. Top 10 Recommendations Based on Frequency Score

<table>
<thead>
<tr>
<th>Rank</th>
<th>Recommendation</th>
<th>Frequency Score (32-96)a</th>
<th>Agreement Score (0-10)c</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do not obtain imaging studies in patients with nonspecific low back pain</td>
<td>94</td>
<td>9.56</td>
</tr>
<tr>
<td>2</td>
<td>Do not prescribe antibiotics for uncomplicated URTIs</td>
<td>92</td>
<td>9.40</td>
</tr>
<tr>
<td>3</td>
<td>Do not perform the PSA test to screen for prostate cancer without a discussion of the risks and benefits</td>
<td>90</td>
<td>9.59</td>
</tr>
<tr>
<td>4</td>
<td>Do not perform laboratory testing in patients with a clinical diagnosis of an uncomplicated URTI</td>
<td>87</td>
<td>9.03</td>
</tr>
<tr>
<td>5</td>
<td>Do not continue pharmacological treatment of GERD with long-term acid suppression therapy without titrating to the lowest effective dose</td>
<td>82</td>
<td>9.50</td>
</tr>
<tr>
<td>6</td>
<td>Do not routinely prescribe antibiotics for acute mild-to-moderate sinusitis</td>
<td>81</td>
<td>9.50</td>
</tr>
<tr>
<td>7</td>
<td>Do not use antimicrobials to treat bacteriuria in immunocompetent older adults</td>
<td>80</td>
<td>9.16</td>
</tr>
<tr>
<td>8</td>
<td>Do not routinely obtain radiographic imaging for patients who meet diagnostic criteria for uncomplicated acute rhinosinusitis</td>
<td>78</td>
<td>9.91</td>
</tr>
<tr>
<td>9</td>
<td>Do not obtain preoperative chest radiography in the absence of a clinical suspicion</td>
<td>77</td>
<td>9.26</td>
</tr>
<tr>
<td>10</td>
<td>Do not use DEXA screening for osteoporosis in women younger than 65 or men younger than 70</td>
<td>72</td>
<td>9.16</td>
</tr>
</tbody>
</table>

Abbreviations: DEXA, dual-energy x-ray absorptiometry; GERD, gastroesophageal reflux disease; PSA, prostate-specific antigen; URTI, upper respiratory tract infection.

* Boldface indicates items retained for top 5.

b Frequency scores are from round 3.

c Agreement scores are from rounds 1 and 2.
frequency, costs, and patient harm. Frequency was defined as how often the average general practitioner is faced with the decision to perform the test or prescribe the treatment. Costs were direct costs and not those of unanticipated adverse effects or complications. Harms were defined as potential harms from the test or treatment, including those that could be expected from the recommendation. For reasons of implementation, the final list was limited to 5 of the 10 most frequent recommendations.

**Results** | Of the 59 experts contacted, 35 agreed to participate (59%; mean [SD] age, 51 [6.3] years; 27 men [77%]). A flowchart of the recommendations is shown in the Figure. Through rounds 1 and 2, a total of 50 items were ranked based on an agreement scale of 1 to 10, including the 12 novel recommendations. The mean (SD) agreement score was 8.52 (0.80) of 10. Of the 18 recommendations reviewed in round 3, the top 10, ranked by perceived frequency, are seen in the Table. The final top 5 list was made by consensus of the advisory committee, who believed there would be too much overlap if there were 2 recommendations for respiratory tract infections.

**Discussion** | Our study illustrates a method to allow medical societies to create their own national lists based on existing international work. Our high agreement scores suggest that there is enough consensus to allow for the adaptation of such lists in other countries.

The Good Stewardship Working Group used a small committee for the generation and initial selection of recommendations and a larger group of 255 health care professionals for validation; we started from an initial list of international recommendations and used a panel of 35 experts for selection. We are currently conducting an implementation study among Swiss general practitioners.

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**Author Contributions:** Drs Selby and Cornuz had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

**LESS IS MORE**

**Development of Choosing Wisely Recommendations for an Inpatient Internal Medicine Service**

As part of the American Board of Internal Medicine Foundation's Choosing Wisely campaign, more than 60 specialty societies have published lists of 5 tests, procedures, or treatments that physicians and patients should question. Recognizing the opportunity for the provision of higher-value care in our own setting, we developed a Choosing Wisely list for the inpatient General Internal Medicine service at Mount Sinai Hospital (MSH), one of the affiliated teaching hospitals at University of Toronto.

**Methods** | All attending physicians who care for patients on the General Internal Medicine service at MSH were invited to recommend 2 commonly ordered tests or procedures for inclusion on our Choosing Wisely list and to participate in an iterative voting process to identify the 5 items that are least likely to be of net benefit to patients. Once solicitation of initial suggestions was complete, the participants were asked to select exactly 5 items for the final Choosing Wisely list via an anony-
mous online survey. The physicians were not asked to rank their selections. The results of each round of voting were distributed to the participants, and the least popular items were eliminated from consideration before subsequent rounds. The selection process was repeated until 5 items had more votes than the remainder of the suggestions, comprising our final Choosing Wisely list. Institutional review board approval was neither obtained nor waived because no patient information was used.

**Results** | Fifteen attending physicians agreed to participate, and a total of 31 initial suggestions were received. The initial list and results of voting are published in Table 1. Fourteen (45%) items received 2 or fewer votes (<15% of participants) in the first round of voting and were eliminated. Consensus regarding the top 5 items (those with the most votes) for the final list was achieved in the second round of voting. The top 5 recommendations were each endorsed by a minimum of 40% of the participants, with the top recommendation being endorsed by more than 50% of participants. The final Choosing Wisely list for the inpatient internal medicine service at MSH is shown in Table 2.

**Discussion** | To our knowledge, this is the first instance of an individual hospital division developing its own Choosing Wisely list. While the selected items may not be generalizable be-

---

### Table 1. List of Choosing Wisely Suggestions and Voting Results

<table>
<thead>
<tr>
<th>Item</th>
<th>Votes</th>
<th>Round 1</th>
<th>Round 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Troponin without suspected acute coronary syndrome</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>CT head in delirious patients without reason to suspect abnormality</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>2-D echocardiogram for patients with recent echo and clinical exam</td>
<td>5</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Urinalysis or urine culture in the absence of symptoms of urinary</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Daily calcium, magnesium, phosphate in absence of abnormalities</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Magnetic resonance imaging of the brain in patients with clinical</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>New benzodiazepine prescriptions for sleep</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Carotid dopplers in patients with stroke who would not be surgical</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Erythrocyte sedimentation rate for anything except temporal</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Nil per os for stroke patients until speech language pathology</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Colace (docusate sodium; Purdue Products LP)</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Ultrasound of the kidney for uncomplicated pyelonephritis</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Repeat thyroid-stimulating hormone</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Chest x-ray to follow up heart failure</td>
<td>2</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Nonferritin iron studies for anemia</td>
<td>2</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Repeat albumin</td>
<td>2</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Gamma-glutamyl transferase</td>
<td>1</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Sputum/blood cultures for low-risk community-acquired pneumonia</td>
<td>1</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Abdominal x-ray to assess for constipation</td>
<td>1</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Chest x-ray to follow up pneumonia before 4-6 wk</td>
<td>1</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Rheumatoid factor</td>
<td>1</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Urine eosinophils</td>
<td>1</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Lactate</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Hepatitis serologies without considering pattern of liver enzyme</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Telemetry for stroke patients (as opposed to Holter monitors)</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Venereal Disease Research Laboratory test</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Autoimmune serologies beyond screening tests (antinuclear antibody,</td>
<td>0</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>75</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

Abbreviations: COPD, chronic obstructive pulmonary disease; CT, computed tomography; exam, examination; NA, items eliminated for having zero votes in the first round could not be voted on in the second; RF, rheumatoid factor.

*a* Original wording of suggestions, as provided by the participating physicians, was preserved.

*b* Indicates that nothing can be eaten or drunk.

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Beyond our scope of practice, the exercise of identifying areas of improvement can be applied in any setting. A potential weakness of our study is the reliance on expert opinion, although substantial evidence supports each of the items we generated. A further possible weakness is the potential for random variation in voting patterns to determine the final outcome owing to our small sample size. However, the general consensus among participants was that the number of high-quality suggestions on the initial list was in excess of 5, making it unlikely that our final list is invalid. Finally, in a small department like ours, we were concerned about the potential for a small number of individuals having an undue influence over the final outcome, which we mitigated through the anonymous online voting process.

Our list is unique to the inpatient internal medicine service, and perhaps to our local environment at MSH. As the complexity of medicine increases, physicians will face difficult choices regarding how best to investigate and treat patients’ conditions. We must also be mindful of the value our care provides in a resource-constrained world. Initiatives such as this are one way to address these problems in the future.

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Drafting of the manuscript: All authors.

Critical revision of the manuscript for important intellectual content: All authors.

Statistical analysis: Gupta.

Administrative, technical, or material support: Detsky.

Conflict of Interest Disclosures: None reported.


Invited Commentary

Challenges in Choosing Wisely’s International Future: Support, Evidence, and Burnout

In the short time since its April 2012 launch by the American Board of Internal Medicine Foundation, the Choosing Wisely campaign has affected more than 60 US specialty societies. Now the campaign is becoming an international phenomenon, as evidenced by Selby et al1 and Gupta and Detsky2 in this issue. These publications should be considered in the context of other national efforts, the most prominent being Choosing Wisely Canada,3 which identifies itself as being modeled after its American counterpart and having “spread to Australia, Germany, Italy, Japan, Netherlands, Switzerland and elsewhere.” This rapid expansion is a heartening sign that there is increasing international sentiment against wasteful medical practices. However, actually decreasing wasteful and harmful health care will require both patient and physician commitment as well as objective evidence of effectiveness. If either is found wanting, the results will be underwhelming.

Both Choosing Wisely and its global counterparts seek to reduce low-value health care by generating “top 5” lists of practices that should be questioned by patients and health care professionals; as such, effecting change from these suggested lists will require constituents' support of the lists. Therefore, it is fitting that the process should be designed to optimize support. The first such top 5 list, generated by the American Academy of Family Physicians and published in Archives of Internal Medicine in 2011,4 was developed using a modified nominal group process. Three years later, the Swiss Society of General Internal Medicine used a process of literature review supplemented by expert opinion, followed by an electronic Delphi process in multiple rounds to identify the top 5 recommendations. Gupta and Detsky2 chose to solicit recommendations from physicians, followed by a voting process to select the top recommendations. The above processes are quasi-systematic methods that focus on physician participation to increase support; however, they rely on subjective perceptions of feasibility and benefit to cost ratio rather than high-quality evidence. An alternative would be to develop a systematic process to identify the practices that

Table 2. Final Choosing Wisely Recommendations for the Inpatient Internal Medicine Service at Mount Sinai Hospital

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Do not order troponins in the absence of angina, new or worsened heart failure, EKG changes consistent with an acute coronary syndrome, or sudden death with ventricular fibrillation</td>
</tr>
<tr>
<td>2</td>
<td>Do not order a) daily complete blood counts (in the absence of active bleeding, symptomatic anemia, febrile neutropenia, or primary hematologic disorder) or b) daily electrolyte panels and/or creatinine levels (in the absence of existing abnormalities such as hypo/hypernatremia or hypo/hyperkalemia, renal failure, active diuresis or intravenous fluid replacement)</td>
</tr>
<tr>
<td>3</td>
<td>Do not order computed tomography of the brain in delirious patients in the absence of abnormal neurological findings, a history of falls, or head trauma</td>
</tr>
<tr>
<td>4</td>
<td>Do not order urinalysis or urine culture for patients in the absence of symptoms of urinary tract infection or, in patients unable to provide a history, the systemic inflammatory response syndrome</td>
</tr>
<tr>
<td>5</td>
<td>Do not order echocardiograms in patients with known heart failure, a recent echo report (eg, within one year if patient has been stable over that time), and an identified precipitant</td>
</tr>
</tbody>
</table>

Abbreviation: EKG, electrocardiogram.
and cost reductions. Doing so might be accomplished with traditional methods of evidence-based recommendations, such as systematic review and health technology assessment. Alternatively, one might leverage already-generated lists of practices that are known to have evidence of harm and are high in cost. Several such lists already exist, with groups having completed systematic reviews as well as sophisticated cost modeling to project potential cost reduction.4-6

Choosing Wisely and Choosing Wisely Canada aspired to initiate conversations about eliminating low-value health care,3,7 and they have succeeded in realizing their goal. We are now ready and eager for the next steps—to realize a measurable decrease in low-value health care utilization. Currently, we are not aware of any evidence that the top 5 lists, in the United States or abroad, have reduced low-value medical practices. The American Board of Internal Medicine Foundation studied the effect of their campaign using a telephone survey of 600 US physicians and found that 21% had heard of the Choosing Wisely campaign and that, among this subgroup, 62% reported having reduced unnecessary testing in the past year.8 These results suggest, at best, a modest effect; but because the results are self-reported, they cannot be used to estimate the net effect on cost-effective care. Building on the success of the Choosing Wisely campaign will require demonstration of a reduction in wasteful practices. As global enthusiasm for top 5 lists mounts, so will the desire to use the lists to shape policy and practices. Evidence of the effectiveness of top 5 lists must grow, not just the number of lists—otherwise, physicians may question the value of the campaigns. The resulting skepticism and cynicism are likely to lead to decreased support.

Even more dangerous to the movement than the present lack of evidence would be top 5 list “burnout.” Survey studies9 have shown that physicians who were faced with multiple guidelines on a single topic become less certain of how to proceed. Professional organizations around the world already publish guidelines that outline the best evidence-based practices. While top 5 lists are not guidelines, it is likely that the finding of guideline burnout is generalizable to top 5 lists. This potential seems more likely now that individual institutions are adopting their own top 5 lists. For example, Gupta and Detsky2 describe the creation of a top 5 list for the general internal medicine inpatient service at Mount Sinai Hospital in Toronto, Ontario, Canada, that might be considered in addition to the top 5 lists from the 21 Canadian specialty societies that partnered with Choosing Wisely Canada. It is not hard to imagine a near future in which every service at an individual institution generates a top 5 list to be considered in the context of the national specialty society top 5 lists, all without specific evidence of effectiveness. Particularly, if some of these lists are discordant, they will be unlikely to change behavior.

Internationally, health care costs are increasing without a commensurate improvement in health outcomes. Therefore, we strongly believe in the global spirit behind the Choosing Wisely campaigns and movement; that is why we advocate that the priority in 2015 should be the thoughtful implementation and rigorous evaluation of existing top 5 lists. Changing behavior is more complex and challenging than writing a list, but clearly the will to change exists among physicians and patients. Systematic, repeated, deliberate effort is required, and tools such as dashboards, performance reporting, financial incentives, benchmarking, and repeated feedback loops may be useful. We believe all top 5 lists should be accompanied by an implementation plan and should be evaluated and continuously monitored to assess their effect on low-value health care utilization.

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Stress Testing Before Low-Risk Surgery: So Many Recommendations, So Little Overuse

The Choosing Wisely (CW) campaign, which commenced in 2011, focuses on reducing medical services that are of questionable value or may be harmful.1 In 1996 and 2002, guidelines from the American College of Cardiology and the American Heart Association implied that routine stress testing before low-risk surgeries should be avoided; this was codified in the 2007 guidelines2 because the risk of cardiac complications from these surgeries is very low. Consequently, 7 specialty societies for the CW campaign