**Table. Potential Savings Among Potential Users**

| Variable | No. of Adults | No. of Weighted Users | Total Savings per Person,[a] 2007 $ | Total Societal Savings,[b] 2007 $ | Out-of-pocket Savings per Person,[a] 2007 $ (95% Confidence Interval) | Total Savings to Patients,[b] 2007 $ | Total Savings to Medicare,[b] 2007 $ |
|---|---|---|---|---|---|---|---|
| All switched | | | | | | | |
| Branded | 1047 | 11 701 128 | 216 (194-238) | 2 529 052 573 | 125 (113-138) | 1 467 669 167 | 442 970 165 |
| Generics | 4042 | 43 676 443 | 74 (69-80) | 3 252 518 957 | 40 (37-44) | 1 761 463 956 | 626 582 594 |
| Total | 4628 | 50 188 290 | 115 (107-124) | 5 781 571 531 | 64 (59-69) | 3 229 133 122 | 1 069 552 759 |
| Top 80% switched | | | | | | | |
| Branded | 958 | 10 728 057 | 231 (208-254) | 2 477 381 456 | 137 (123-150) | 1 465 834 780 | 435 423 813 |
| Generics | 3199 | 34 323 534 | 92 (85-99) | 3 163 901 619 | 51 (47-55) | 1 738 475 939 | 605 471 857 |
| Total | 3702 | 39 921 744 | 141 (131-151) | 5 641 283 075 | 80 (74-86) | 3 204 310 718 | 1 040 895 670 |
| Top 50% switched | | | | | | | |
| Branded | 811 | 9 001 487 | 262 (236-287) | 2 354 752 998 | 161 (145-176) | 1 445 988 387 | 415 959 412 |
| Generics | 1914 | 20 457 160 | 131 (120-142) | 2 676 650 960 | 77 (71-84) | 1 579 556 244 | 485 712 268 |
| Total | 2314 | 24 889 392 | 202 (187-217) | 5 031 403 958 | 122 (112-131) | 3 025 544 631 | 901 671 680 |
| Top 30% switched | | | | | | | |
| Branded | 607 | 6 747 286 | 324 (294-353) | 2 183 990 629 | 204 (185-223) | 1 378 153 731 | 363 155 303 |
| Generics | 1103 | 11 508 520 | 176 (161-191) | 2 028 496 166 | 112 (106-118) | 1 290 853 911 | 339 736 655 |
| Total | 1388 | 14 717 599 | 286 (266-307) | 4 212 486 795 | 181 (170-193) | 2 669 007 642 | 702 891 958 |

[a] These numbers are weighted numbers that reflect the survey design, sampling frame, and adjustments for household nonresponse and planned oversampling. The weighted results therefore represent estimates for the noninstitutionalized US population.
[b] These numbers are savings per person multiplied by the number of weighted users.

individuals to low-cost generic drug programs, patients, payers, and taxpayers could save enormously.

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**Additional Information:** For more information about RUPHI, please visit our Web site at http://www.ruphi.pitt.edu. Information on Re-engineering the Clinical Research Enterprise can be obtained from http://nihroadmap.nih.gov/clinicalresearch/overview-translational.aspx.

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## The Impact of Medical School Oaths and Other Professional Codes of Ethics: Results of a National Physician Survey

Most US medical students participate in "white coat" ceremonies in which they recite an oath, often with reference to the Oath of Hippocrates. Reciting such oaths or endorsing shared ethical standards such as the American Medical Association (AMA) Code of Ethics can nurture professionalism by conveying a sense of gravity and belonging to something greater than oneself.[1] Yet historic oaths can sound anachronistic to the modern ear, and the oaths sworn in



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**Table. Self-reported Influence of Physician Oaths Taken in Medical School and of Other Sources of Moral Guidance Among 1032 Practicing US Physicians**

| Sources of Moral Guidance That Significantly Influence Professional Practice | No. (%) (n=1025)[a] |
|---|---|
| Medical school physician oaths | 269 (26) |
| AMA Code of Ethics | 166 (16) |
| Other professional society codes | 112 (11) |
| Great moral teachers | 362 (35) |
| Specific traditions | 292 (28) |
| Personal sense of right and wrong | 948 (92) |
| Other | 252 (25) |

Abbreviation: AMA, American Medical Association.
[a] Totals do not sum to 1032 owing to missing values.

most medical schools modify the original Hippocratic Oath by excluding significant portions and adding language deemed more fitting.[2,3] Revised oaths, while more relevant to contemporary medicine, may suffer from being arbitrary and self-serving.[4,5]

Despite controversies over the role of oath ceremonies in US medical education, little is known about how taking a medical school oath influences physicians' professional formation and practice.

**Methods.** In 2009, we mailed a confidential, self-administered questionnaire to 2000 practicing US physicians, 65 years or younger, from all specialties selected randomly from the AMA Physician Masterfile described elsewhere.[6] The Mayo Clinic institutional review board approved the study.

Participants indicated if their medical school conducted an oath ceremony, and, if so, whether the physician participated as well as indicating which oath was used. Then, physicians indicated how much physicians' oaths had influenced their own professional lives (a lot, somewhat, not very much, not at all) and which of several other sources of moral guidance had significantly influenced their professional practice.

Given the religious nature of historic oaths (eg, Hippocratic Oath, Prayer of Maimonides), we hypothesized that physicians' religious characteristics would be associated with their judgments about the influence of oaths and codes in practice.[7] Therefore, we assessed how important religion was in their life ("the most important part of my life," "very important in my life," "fairly important in my life," "not very important in my life," or "not applicable—I have no religion").

**Results.** Of 2000 physicians, 105 could not be contacted; 1032 of 1895 eligible physicians returned completed surveys after 3 mailings (cooperation rate of 54%). Cooperation rates varied somewhat by region (Northeast, 53%; South, 52%; Midwest, 62%; and West, 52% [$P=.03$]) and age category (<50 years, 51%; and ≥50 years, 59% [$P<.001$]) but not by sex or specialty.

Most respondents reported their medical school conducting an oath ceremony (79%), with nearly all of those reporting participation in that ceremony (97%). Of those of who took an oath in medical school, most (85%) recalled using some version of the Hippocratic Oath (modified or original), though small minorities took an Osteopathic oath (6%), an Oath and/or Prayer of Maimonides (3%), or the Declaration of Geneva (2%).

One in 4 physicians (26%) indicated that physician oaths exerted "a lot" of influence on their practice. The rest indicated that oaths had influenced their practice "somewhat" (37%), "not very much" (24%), or "not at all" (13%).

When asked about other sources of moral guidance that had "significantly" influenced their professional practice, few physicians (16%) cited the AMA Code of Ethics. Many more said their "personal sense of right and wrong" (92%), great moral teachers (35%), and specific traditions (28%) influenced their practice (**Table**).

After controlling for age, sex, race, region, and specialty, physicians who reported their religion being "the most important" or "a very important" part of their life were more likely than physicians who "have no religion" to report that physician oaths had influenced their professional life "a lot" (odds ratio, 1.8; 95% confidence interval, 1.4-2.5; $P<.001$). Similarly, compared with those who "have no religion," physicians who reported their religion as "the most important part of their life" were more likely to report that the AMA Code of Ethics influenced their professional practice "significantly" (odds ratio, 2.2; 95% confidence interval, 1.0-4.7; $P<.05$).

**Comment.** These data indicate that most practicing US physicians took some physician oath in medical school. However, only 1 in 4 practicing US physicians acknowledged a strong influence of oaths on their practice. Other professional codes, such as the AMA Code of Ethics, seem to play a smaller role in medical practice. For moral guidance in their professional practice, physicians appear to rely most on their own personal sense of right and wrong, with some awareness of the influence of great moral teachers and specific traditions.

In light of these data, the binding moral identity that oaths and codes are/were intended to inspire seems no longer to serve that function for most US physicians. Our data suggest that if oaths and codes are to play an important role in medical education in the future, leaders in professionalism may need to draw connections between standards of professionalism and the personal, philosophical, and theological traditions from which physicians actually draw their moral guidance.[8]

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**Additional Information:** Information on the NCRR is available at http://www.ncrr.nih.gov/. Information on the Reengineering the Clinical Research Enterprise can be obtained from http://nihroadmap.nih.gov.

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## COMMENTS AND OPINIONS

### Considering Selection Bias When Developing a Search Strategy

We read with great interest the article by Sciarretta et al[1] on antihypertensive treatment and development of heart failure in hypertension. They performed the largest network meta-analysis in essential hypertension, to our knowledge, and showed that the use of diuretics and renin-angiotensin system inhibitors are the most effective first-line antihypertensive drug for preventing heart failure. In this meta-analysis, however, the search strategy and study selection are somewhat unclear.

The Candesartan Antihypertensive Survival Evaluation in Japan (CASE-J) trial, published in 2008,[2] assessed cardiovascular outcomes in high-risk hypertensive patients receiving either candesartan or amlodipine. The primary end point of the CASE-J trial was a composite of cardiovascular morbidity and mortality, including heart failure. We think that this trial meets the inclusion criteria in the

*See also page 384*

meta-analysis by Sciarretta et al,[1] but it was not included despite a careful search using 2 databases by 2 investigators. Also, neither the KYOTO HEART study[3] nor the Heart Institute of Japan Candesartan Randomized Trial for Evaluation in Coronary Artery Disease (HIJ-CREATE)[4] was included. The authors also checked in the references of a previous meta-analysis by Verdecchia et al.[5] This could not be enough to identify all randomized controlled trials to evaluate a wide range of antihypertensive drugs because this previous meta-analysis by Verdecchia et al[5] aimed to compare old antihypertensive drugs (diuretics and β-blockers) or placebo with new drugs (renin-angiotensin system inhibitors or calcium channel blockers). We are afraid that other important clinical trials are not included in the meta-analysis by Sciarretta et al.[1]

Although a meta-analysis can provide more precise estimates of interventions, it always has a potential for selection bias. Therefore, we would like to know in more detail the search strategy used in this meta-analysis based on the Preferred Reporting Items for Systematic Reviews and Meta-analysis statement.

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