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Invited Commentary

Patient Decision Aids for Discouraging Low-Value Health Care Procedures

Null Findings and Lessons Learned

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Per-capita health care spending in the United States is disproportionately higher than that of other industrialized nations, while life expectancy is appreciably lower. In 2013, US health care spending totaled \$2.9 trillion.¹ At \$9255 per person, this was 42% higher than the next highest per-capita



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spender. Yet, the United States ranks 50th for life expectancy among 221 nations and 27th out of the 34 industrialized Organisation for Economic Co-operation and Development (OECD) countries. With a focus on maximizing the return of health care spending, of interest are best practices for reducing the use of medical procedures that offer low net benefit or, at the population level, possible net harm.

In this issue of *JAMA Internal Medicine*, Sheridan and colleagues² conducted a randomized clinical trial comparing alternative versions of printed patient decision support materials to discourage acceptance of low-value preventive health services. The targeted health services were prostate cancer screening with prostate-specific antigen (PSA) (for men ages 50-69 years), osteoporosis screening (for women ages 50-64 years), and colorectal cancer screening (for both sexes, ages 76-85 years). The information, printed on a single page in 4 formats, varied only in how harms and benefits were presented. The formats were qualitative (words only), quantitative (with numbers), quantitative with a narrative (a story of an individual thinking about the numbers), and quantitative with framing (to promote risk aversion and discourage screening).

Overall, the study showed no significant change in intention to screen preintervention to postintervention and no difference between the 4 formats. Addressing an important clinical and public health issue, the investigators and *JAMA Internal Medicine* are commended for publishing these null findings. We interpret the findings herein with consideration of the study's patient sample, risk communication strategy, and evaluation methods, and identify potential future research directions.

Described as a convenience sample, participants averaged 65 years of age, were highly educated (>90% were college educated, many with advanced degrees), nearly all insured, and all receiving continuity care within 4 selected community-based, primary care practices. Despite attempts to recruit patients not screened previously, most had in the past completed the screening tests of interest (>80% for PSA and nearly 100% for colorectal cancer screening). Just over one-third (39%) of invited eligible patients enrolled. No financial incentive was provided for study participation. Patient factors predictive of study enrollment were not reported. It is likely that interest in screening related to participation. Notably, the

sample's intention for screening at baseline was characterized as high. Unknown is how study findings generalize to younger, more socioeconomically disadvantaged groups, and those without interest and prior screening experience.

The primary outcome was patient self-reported intention to accept future screening, not medical chart documentation of actual screening behavior. The investigators² acknowledged that intention is an incomplete measure, predicting a maximum of 30% variance in behavior. Research^{3,4} in various wide-ranging fields has consistently found that past behavior is the best predictor of future behavior. It is unsurprising then that in a patient group compliant in the past with clinician screening recommendations, the effect of this low-intensity patient-focused intervention would be null.

Some points are worth mentioning with regard to the risk communication approach. Although aimed at reducing acceptance of screening, the study materials used gain-framed messaging (eg, foregoing a PSA test would avoid biopsy, worry, and unnecessary treatments). Best practices suggest the utility of gain-framed messages for promoting behavior and loss-framed messages for reducing a behavior.⁵ The decision aids emphasized the problem of overdiagnosis, represented indirectly with reference to how incident disease rates exceed clinically important outcomes, such as mortality or fractures. While the quantified benefits were reported for the number of patients screened (eg, 1 fewer death in every 1000 men screened), the event rates for treatment complications applied only to treated patients (eg, 300 of 1000 men treated have sexual dysfunction and urinary tract problems), which the investigators² acknowledged likely portrayed an overly negative view of screening. The investigators² pilot tested only the quantitative vignette with patients; unknown is the degree to which patients noted and appreciated the subtle differences in each risk communication format. Finally, the materials were static without tailoring to patient race or ethnicity, personal or family medical history (eg, cancer, fractures), prior screening behavior, or current intention. Research generally has found that patients have greater recollection for and are more responsive to tailored health communications.⁶ Process measures that would have been useful to collect include the amount of time patients spent reading the material and comprehensibility and perceived usefulness of the information.

Also of interest are clinician effects. The study's focus was on patient acceptance of screening, which ostensibly would be recommended by their health care clinicians. Unmentioned were efforts to attenuate clinician recommendation for low-value screening practices. In the literature, standardized protocols, group education, alert systems with reminders, and

ongoing feedback have positively influenced clinician behavior.⁷ The study's analyses also did not adjust for clustering by clinician or within clinic. One would expect shared variance in use of preventive health services among patients treated by the same clinician and within the same clinic.

While none of the methods decreased participants' intentions to participate in the screening programs, small improvements were found in general and disease-specific knowledge, screening attitudes, and perceived net benefit, though again, not differentially so by treatment arm. Most of the assessments were study-created scales, many lacking information on validity, internal consistency, and stability over time; hence, the implication of these small reported changes are unknown. Needed are validated scales of patient behavior and intentions regarding low-value medical practices.

Given the highly educated sample and small increases in knowledge found, it seems that acceptance of screening was largely unrelated to transferred knowledge, at least as communicated on a single-page information sheet varied only in written presentation of risks and benefits. That is, the intervention tested was brief, static, and subtle in the degree to which the 4 formats differed.

Reducing the use of low-value health services is a complex issue, with significant clinical and health policy implications. The study by Sheridan and colleagues² provides a useful vantage point for informing future efforts. Certainly, hindsight is 20/20. In interpreting study findings, key consid-

erations included the representativeness of the sample, the quality of the outcome measures, intervention characteristics, and the fidelity of delivery. To inform clinical practice, future study is needed with more diverse patient samples, process measures of patient-clinician communications, and tracking of outcomes to actual behavior. Furthermore, the null findings suggest the need for novel approaches to dissuade low-value health services that move beyond 1-size-fits-all patient education interventions. More personalized and tailored approaches would include computer-assisted behavior change coaching, applied virtual reality technologies, and interactive digital games. Also important are strategies that consider the dyadic nature of the patient-clinician relationship. A leading National Institutes of Health research priority and health movement backed by President Barack Obama, personalized or precision medicine recognizes that variability in response to medical treatment and prevention exists because of individual differences in genes, environment, and lifestyle.⁸ Personalized approaches tailored to familial and genetic risk, environment, and lifestyle are worth testing for coaching patient decision making around low-value medical procedures. That most of the study sample had been screened prior, likely within the clinical practice through which the intervention was being tested, without ill-reported effects and with intention to screen again, suggests the appropriateness of a more personalized and multilevel systems approach.

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