

Other types of participants are now sharing immersion experiences.<sup>2</sup> Aiming to move beyond governance to engage and educate our community, we created a multiweek immersion program for a local journalist who subsequently authored a series of articles explaining concepts such as cost shifting and indigent care and illustrating why our state's failure to expand Medicaid was so painful for our community.<sup>3</sup>



An audio interview with Dr. Paulus is available at [NEJM.org](http://NEJM.org)

We then realized that an Immersion Day might also benefit state and federal policymakers — who, after all, fund the care of more than 70% of Mission Health patients. So we created a Policy-

maker Immersion Day. The first participant wrote an op-ed about his experience,<sup>4</sup> and his work in the state capital is now informed by what he learned. Other participants have followed, and we now offer the experience to national policymakers as well.

Immersion is not a hospital tour. Through careful preparation, we've built a transformative experience that can guide our board. Deep immersion in the work of our health system has strengthened governance and engendered trust in our community, staff, and physicians, while elucidating health care for policymakers. After three years of Immersion Days, we cannot imagine being governed by a board

that hasn't seen so intimately how a health system works.

Disclosure forms provided by the authors are available with the full text of this article at [NEJM.org](http://NEJM.org).

From Mission Health, Asheville, NC.

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## The Science of Choosing Wisely — Overcoming the Therapeutic Illusion

David Casarett, M.D.

In recent years, the United States has seen increasing efforts to reduce inappropriate use of medical treatments and tests. Perhaps the most visible has been the Choosing Wisely campaign, in which medical societies have identified many tests, medications, and treatments that are used inappropriately. The result is recommendations advising against using these interventions or suggesting that they be considered more carefully and discussed with patients.

The success of such efforts, however, may be limited by the tendency of human beings to overestimate the effects of their actions. Psychologists call this phenomenon, which is based on

our tendency to infer causality where none exists, the “illusion of control.”<sup>1</sup> In medicine, it may be called the “therapeutic illusion” (a label first applied in 1978 to “the unjustified enthusiasm for treatment on the part of both patients and doctors”<sup>2</sup>). When physicians believe that their actions or tools are more effective than they actually are, the results can be unnecessary and costly care. Therefore, I think that efforts to promote more rational decision making will need to address this illusion directly.

The best illustration of the illusion of control comes from studies in which volunteers were asked to figure out how to press a button in order to cause a panel

to light up.<sup>3</sup> The volunteers searched enthusiastically for strategies and were generally confident that they'd succeeded. They didn't know, however, that their success was determined entirely by chance.

The phenomenon has since been described in widely varied settings. Gamblers, for example, consistently overestimate the control they have over outcomes, both in gambling and in everyday life. Their belief leads them to engage in seemingly bizarre or ritualistic behaviors such as throwing dice in a certain way or wearing specific colors. But the illusion of control is widespread, and its effects may be enhanced when people are placed in posi-

tions of authority or subjected to time pressure or competition.

The decisions that physicians make at the bedside are both more complicated and more evidence-based than the choices of volunteers in a laboratory. Nevertheless, physicians also overestimate the benefits of everything from interventions for back pain to cancer chemotherapy.<sup>4,5</sup> And their therapeutic illusion facilitates continued use of inappropriate tests and treatments.

The outcome of virtually all medical decisions is at least partly outside the physician's control, and random chance can encourage physicians to embrace mistaken beliefs about causality. For instance, joint lavage is overused for relief of osteoarthritis-related knee pain, despite a recommendation against it from the American Academy of Orthopedic Surgery. Knee pain tends to wax and wane, so many patients report improvement in symptoms after lavage, and it's natural to conclude that the intervention was effective.

Moreover, the therapeutic illusion is reinforced by a tendency to look selectively for evidence of impact — one manifestation of the “confirmation bias” that leads us to seek only evidence that supports what we already believe to be true. Physicians may be particularly susceptible to that bias when caring for a patient with a complex illness. When a patient has multiple medical problems, it's often possible to find some evidence of improvement after an intervention, particularly if the patient is being intensively monitored. For instance, the Critical Care Collaborative advises against administering total parenteral nutrition during a patient's first

7 days in an intensive care unit. However, if it is used, available tests are likely to provide at least a few indications of improvement in the patient's electrolytes, volume status, or prealbumin level.

The illusion of control is deeply ingrained in human psychology in the form of a heuristic, or rule of thumb, that we rely on to interpret events and make decisions. Many heuristics are subconscious and therefore difficult to avoid or eradicate, but we can ameliorate

their effects by using countervailing, conscious heuristics. Indeed, physicians already use this strategy to improve diagnostic decisions. For instance, we tend to ignore the pretest probability of an illness when making a diagnosis, which can cause us to overdiagnose rare conditions and underdiagnose common ones; medical students are therefore taught the rule “When you hear hoofbeats, look for horses, not zebras.”

This strategy can help curb the therapeutic illusion. For example, since reduced oral intake can be a sign of advanced dementia and is often a marker of poor prognosis, several medical societies have recommended against routine use of feeding tubes in

patients with dementia. Although refraining from placing a feeding tube is an emotional decision with ethical and legal implications, two conscious heuristics can help counteract the therapeutic illusion.

The first might be formulated as “Before you conclude that a treatment was effective, look for other explanations.” For instance, if the tube was placed during a period of illness and decreased oral intake when a patient's weight decreased, weight gain might be explained by regression to the mean. Similarly, decreased activity, a successfully treated infection, or control of agitation could help explain weight gain.

The second heuristic might be “If you see evidence of success, look for evidence of failure.” In other words, test assumptions of effectiveness by looking for negative outcomes. Even if a patient gains weight, other outcomes might include continued episodes of aspiration pneumonia, or new or progressive decubitus ulcers. Physicians can lay the foundation for this heuristic before initiating an intervention by being explicit about how success and failure will be measured.

The therapeutic illusion is not the only factor driving overtreatment. Decisions about feeding tubes in advanced dementia, for instance, are influenced by reimbursement pressures, quality measures, fear of litigation, and family expectations. To say that ineffective treatment can be curtailed by managing the therapeutic illusion, without questioning the effectiveness of that strategy, is in effect to fall prey to the therapeutic illusion. Therefore, research is needed to determine whether and how management



of the therapeutic illusion could reduce overtreatment. Research could also focus on the roles that new tools might play in countering the illusion. For instance, by collecting, tracking, and displaying outcomes, an electronic medical record could guide more rational assessments of causality and more balanced evaluations of impact.

Research is also needed to define how efforts to reduce the therapeutic illusion can best be integrated into medical education. Just as we're all subject to the illusion of control, physicians are vulnerable to the therapeutic illusion long before they see their first patient. Therefore, strategies to uncover and minimize this bias should be developed and tested in medical school, in postgraduate medical education, and throughout lifelong learning.

Finally, research is needed to investigate the positive role that the therapeutic illusion might play in health care. For instance, perhaps it contributes to the psychological well-being of physicians

and other health care providers by bolstering their confidence and sustaining their belief in the value they offer to patients. It might also be a necessary ingredient in medical decision making. A purely rational approach to decision making in which physicians question and doubt their own effectiveness might lead to undertreatment, with resultant harms that are as substantial as those of overtreatment.

Choosing Wisely may be an ambitious attempt to address the problem of overtreatment, but it's not realistic to think that any single solution will be effective. The campaign's reliance on medical societies risks a certain parochial defensiveness, which has produced recommendations focused disproportionately on other specialties' procedures. A more comprehensive, broad-based approach could begin with education that provides trainees with the skills to recognize and manage the therapeutic illusion. In addition, it will be essential to enlist the support of patient groups and payers.

Such efforts will take time, effort, and organization. In the meantime, the therapeutic illusion is one contributor to overtreatment that all physicians can begin to address immediately. By evaluating their own practice, examining their own beliefs, and applying simple conscious heuristics, all physicians can contribute to more rational, evidence-based care.

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From the University of Pennsylvania Perelman School of Medicine, Philadelphia.

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## Federal Research Regulations for the 21st Century

Bernard Lo, M.D., and Mark Barnes, J.D., LL.M.

Innovative research combining analysis of biospecimens, detailed clinical information, and real-time data from mobile devices has enormous potential for improving patient care, but this research raises ethical dilemmas that current federal human-subjects regulations, known as the Common Rule, do not adequately address. Eighteen federal agencies have proposed extensive re-

visions to these regulations,<sup>1</sup> the first major overhaul in 25 years. Although the Common Rule needs to be updated and improved, we believe the notice of proposed rule making (NPRM) has serious conceptual failures.

The proposal fails to anticipate that ongoing research innovations will necessitate future regulatory changes and so fails to require that regulatory guid-

ance be reviewed and updated regularly. Moreover, even in this first iteration, the proposal fails to build on available empirical evidence and current technology to improve protections for research participants. Finally and more specifically, it overlooks the context and origins of widespread public objections to certain research involving biospecimens.

Scientific and technological