Researchers identify 146 contemporary medical practices offering no net benefits

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While there is an expectation that newer medical practices improve the standard of care, the history of medicine reveals many instances in which this has not been the case. Reversal of established medical practice occurs when new studies contradict current practice. Reporters may remember hormone replacement therapy as an example of medical reversal. A new analysis published in *Mayo Clinic Proceedings* documents 146 contemporary medical practices that have subsequently been reversed.

A team of researchers led by Vinay Prasad, MD, Medical Oncology Branch, National Cancer Institute, National Institutes of Health, Bethesda, MD, reviewed ten years of original articles published in the *New England Journal of Medicine* testing standard of care.

"The purpose of our investigation was to outline broad trends in medical practice and identify a large number of practices that don't work," says Dr. Prasad. "Identifying medical practices that don't work is necessary because the continued use of such practices wastes resources, jeopardizes patient health, and undermines trust in medicine."

Dr. Prasad and his investigative team evaluated 1,344 original articles published in the *New England Journal of Medicine* between 2001 and 2010 that examined a new medical practice or tested an established one. This included assessment of a screening, stratifying, or diagnostic test, a medication, a procedure or surgery, or any change in health care provision systems.

Dr. Prasad and colleagues made several interesting findings. First, only a minority of studies over the last 10 years even tested current medical practices. Dr. Prasad found that only 27% (363/1344) of articles that tested a practice tested an established one. Instead, the vast majority of such studies, 73% (981/1344), tested a new medical practice. Dr. Prasad says, "While the next breakthrough is surely worth pursuing, knowing whether what we are currently doing is right or wrong is equally crucial for sound patient care."

Dr. Prasad's major conclusion concerns the 363 articles that test current medical practice—things doctors are doing today. His group determined that 146 (40.2%) found these practices to be ineffective, or medical reversals. Another 138 (38%) reaffirmed the value of current practice, and 79 (21.8%) were inconclusive—unable to render a firm verdict regarding the practice.

Dr. Prasad comments, "A large proportion of current medical practice, 40%, was found to offer no benefits in our survey of 10 years of the *New England Journal of Medicine*. These 146 practices are medical reversals. They weren't just practices that once worked, and have now been improved upon; rather, they never worked. They were instituted in error, never helped patients, and have eroded trust in medicine."

Dr. Prasad adds, "Health care costs now threaten the entire economy. Our investigation suggests that much of what we are doing today simply doesn't help patients. Eliminating medical reversal may help address the most pressing problem in health care today."

Key examples of medical reversal include the following:

Stenting for stable coronary artery disease was a multibillion dollar a year industry when it was found to be no better than medical management for most patients with stable coronary artery disease.

Hormone therapy for postmenopausal women intended to improve cardiovascular outcomes was found to be worse than no intervention. The routine use of the pulmonary artery catheter in patients in shock was found to be inferior to less invasive management strategies.

Other instances pertain to the use of the drug aprotinin in cardiac surgery, use of a primary rhythm control strategy for patients with atrial fibrillation, use of cyclooxygenase 2 inhibitors, early myringotomy procedures, and application of recommended glycemic targets for patients with diabetes.

Says Dr. Prasad, "To our knowledge, this is the largest and most comprehensive study of medical reversal. The reversals we have identified by no means represent the final word for any of these practices. But, the reversals we have identified, at the very least, call these practices into question."

In an accompanying editorial, John P. A. Ioannidis, MD, DSc, of the Stanford Prevention Research Center, Department of Medicine and the Department of Health Research and Policy at Stanford University School of Medicine, comments on the work of Prasad and his team and evaluates it within a broader context.

"The 146 medical reversals that they have assembled are, in a sense, examples of success stories that can inspire the astute clinician and clinical investigator to challenge the status quo and realize that doing less is more," notes Dr. Ioannidis. "If we learn from them, these seemingly disappointing results may be extremely helpful in curtailing harms to patients and cost to the health care system."

According to Dr. Ioannidis, it is just as important to promote and disseminate knowledge about ineffective practices that should be reversed and abandoned. Given the widespread attention that practice

guidelines typically receive, particularly when published by authoritative individuals or groups, he questions whether a generally higher level of evidence should be required before these guidelines are recommended and can impact clinical practice.

"Finally, are there incentives and anything else we can do to promote testing of seemingly established practices and identification of more practices that need to be abandoned? Obviously, such an undertaking will require commitment to a rigorous clinical research agenda in a time of restricted budgets," concludes Dr. Ioannidis. "However, it is clear that carefully designed trials on expensive practices may have a very favorable value of information, and they would be excellent investments toward curtailing the irrational cost of ineffective health care."

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