

Goal-Oriented Prevention: How to Fit a Square Peg into a Round Hole

James W. Mold, MD, MPH, Darren A. DeWalt, MD, MPH, and F. Daniel Duffy, MD

Prevention does not fit well within our problem-oriented medical paradigm in which the focus is on curing or ameliorating existing diseases. It is easier and more satisfying to solve existing problems than it is to advise and motivate patients to implement measures to prevent future problems that may or may not occur. Clinician motivation is further diminished by the time required to help people make lifestyle changes, the low reimbursement rate, and the fact that the benefits, if any, are often not apparent for years. Typical patient panel sizes make it difficult to provide all of the recommended disease-oriented preventive services and to also address the social and lifestyle factors that can impact future health problems. One solution to this square peg-round hole mismatch is to focus on the goals, life extension and prevention of future disabilities. (J Am Board Fam Med 2023;36:333–338.)

Keywords: Chronic Disease, Clinical Decision-Making, Clinical Medicine, Disease Management, Health Promotion, Lifestyle, Patient-Centered Care, Preventive Care, Primary Health Care

Prevention and Problem-Solving

Prevention has never fit particularly well in our problem-oriented medical paradigm. It is hard to solve a problem that has yet to occur. In the early days of problem-oriented medical records, physicians often added “health promotion disease prevention” to patients’ problem lists as a reminder. The Centers for Medicare and Medicaid Services chose to call preventive visits wellness visits, presumably to distinguish them from sickness visits. Of course, most chronic illness care involves tertiary prevention, but addressing primordial (eg, social and environmental determinants), primary (eg, behavioral, immunizations, and other prophylactic measures), and secondary prevention (eg, screening) within routine medical encounters often involves flipping a mental switch and

moving in an entirely different direction, after new and ongoing health concerns have been addressed.¹

It should not be surprising then that delivery and implementation of preventive services is less than optimal. In 2015, fewer than 10% of adults over 35 reported having received all of the highest-priority preventive services recommended for them.² Only two thirds are up-to-date on breast, cervical, and colon cancer screenings, and rates of immunization for pneumococcal pneumonia, influenza, and herpes zoster are only 67%, 51%, and 39%, respectively. Although firearm injuries are the second leading cause of death in children, gun safety is rarely discussed during well child visits, and fewer than 50% of households with children and guns keep the firearms locked up.^{3–5} During a pandemic in which more than a million people have died from coronavirus infections in the United States, only 50% of adults and 34% of children more than 5 years old are vaccinated with at least 1 booster.^{6,7} In many respects, prevention is like a square peg that we are trying to fit into a round hole. The adverse consequences of this mismatch between prevention and problem-solving can be seen in patient and clinician motivation, practicality, conceptualization, and focus.

Motivation

On a day-to-day basis, people tend to be more motivated to solve existing problems, especially

This article was externally peer reviewed.

Submitted 16 August 2022; revised 15 November 2022; accepted 18 November 2022.

From the University of Oklahoma Health Sciences Center, Chapel Hill, NC (JWM); Division of General Medicine and Clinical Epidemiology, University of North Carolina School of Medicine, Chapel Hill, (DAD); Internal Medicine and Medical Informatics, University of Oklahoma–Tulsa School of Community Medicine, Tulsa (FDD).

Funding: None.

Conflict of interest: JWM has published two books on the subject of goal-oriented care from which he receives income.

Corresponding author: James W. Mold, MD, MPH, University of Oklahoma Health Sciences Center, 1001 Blackwood Mountain Road, Chapel Hill, NC 27516 (E-mail: jameswmold@gmail.com).

when they interfere with essential and desired activities, than to take steps to try to increase their life expectancy.⁸ The potential benefits of preventive services for an individual are often unknown or hard to calculate. As a result, clinical advice tends to be focused on intermediate outcomes like earlier detection of cancer rather than on more meaningful metrics like average number of additional months or years of life gained or reduction in risk of future disabilities. When such information has been published, it is often difficult to find and to explain.

Clinician motivation to provide preventive services is similarly diminished by patients' quality-of-life priorities and the lack of meaningful impact measures for preventive services. For example, while helping a patient quit smoking is rewarding, there is little immediate benefit and no easily calculable metric indicating the amount of benefit that particular person can expect in the future. By comparison, diagnosis and successful treatment of an acute injury or infection produces measurable benefits within a short period of time.

Practicality

Yarnall and colleagues⁹ calculated that, in a primary care physician's practice with 2500 active patients, delivery of all recommended primary and secondary preventive services would take about 7.4 hours per workday. They calculated that an additional 3.5 to 10.6 hours per day would be required to manage chronic health conditions, depending on level of control.¹⁰ In a 2022 study, despite the implementation of electronic records, those estimates were even higher: 14.1 hour per day to provide preventive care and 7.2 hours per day to provide chronic disease care.¹¹ While much of the work involved could be delegated to nonphysicians, many physicians prefer to be involved in aspects that involve individualized decision-making.¹

Preventive services guidelines can be complex when they apply only to at-risk patients. Yet electronic decision-support algorithms are typically only able to generate lists of primary and secondary preventive measures based on age and gender. Primordial and tertiary prevention are often managed separately, using surveys linked to community resources and electronic registries. Thus, electronic prompts and reminders often consist of a poorly coordinated mix of social determinants surveys, age- and gender-based algorithms, and single-

disease registries. Because guidelines are typically single-disease specific, the recommended periodicities are often discordant.

A common reason clinicians give for neglecting preventive care is inadequate reimbursement. Reimbursement probably is inadequate, though the actual costs of providing individual preventive services are hard to find. For many screening tests (eg, mammography, colonoscopy, bone densitometry), substantial reimbursement goes to the proceduralist, while far less goes to the primary care practice providing the education, motivation, referral, and tracking required to make the procedure happen. Mismatches between time and effort and reimbursement for preventive care are further evidence of the difficulty of incorporating prevention into problem-oriented care.

Conceptualization

In an attempt to fit prevention into our problem-oriented paradigm, we are inclined to view risk factors as diseases. That conceptualization encourages dichotomization (eg, nonsmoker or smoker) or trichotomization (eg, normoglycemia, prediabetes, diabetes). However, although hypertension, the disease, is either present or absent, systolic, diastolic, and mean blood pressures are continuous variables with different optimal levels for different circumstances,¹² and ideal blood pressure levels are probably different for each person depending on unique risk profiles, which supports individualization over standardization.¹³

Focus

Because our focus is on preventing the occurrence and consequences of individual diseases, research, administration, and funding tend to be siloed by disease. As a result, we know more about how to convince people to have colonoscopies than we do about how to help them decide which preventive services would provide the greatest benefit. Preventive care has become a time-sensitive box-checking activity, in which clinicians either reduce the number of services recommended to a manageable few or distribute the available time across all strategies regardless of impact or degree of difficulty.¹ In the process, much of the knowledge gleaned from research on preventing individual diseases is lost in the quest for efficiency.

A Potential Solution—Goal-Oriented Prevention

Resolving the peg-and-hole dilemma might be as simple as shifting the focus from strategies (eg, reducing blood pressure) and objectives (eg, reducing the risk of heart attack) to the more meaningful person-centered goals, preventing premature death and disability.^{14,15} Viewing prevention through a goal-oriented lens would remind clinicians and patients that primordial, primary, secondary, and tertiary preventive strategies all have a common purpose, and it would encourage rational prioritization.

To help people live longer with fewer disabilities, it makes sense to emphasize the strategies likely to have the greatest impact. While those strategies will be different for different people, some general principles apply. To survive, human beings need adequate nutrition, physical activity, sleep, safety, and shelter, and we are susceptible to a variety of lethal infectious agents and toxins like tobacco and alcohol and various types of addiction. Addressing those requirements, exposures, and susceptibilities as priorities can therefore have a major impact on longevity.¹⁶ In many cases those same strategies can reduce the risk of disability. However, if we are interested in preventing future disability, attention should also be paid to measures that could be taken to reduce the risk of common nonfatal causes of disability, such as cognitive impairment, musculoskeletal conditions, and sensory loss.^{17–19}

As we age, the probable causes of our death and disabilities often become clearer. For example, a person with advanced chronic obstructive lung disease is most likely to die from a pulmonary infection or acute airway obstruction. A person with congestive heart failure is most likely to die from an arrhythmia or reduced tissue perfusion. Strategies aimed at preventing or delaying those causes—hand washing, avoiding infectious contacts, and immunizations in the first instance and pharmacologic interventions, meticulous self-care, and close clinical monitoring in the second—would likely have a greater impact on survival than colonoscopy, mammography, or cholesterol reduction. That does not mean that those other strategies should never be considered, just that the most impactful strategies should be given priority. The law of limited returns suggests that nearly all the benefit is often derived from the best 3 or 4 strategies.²⁰

Although life extension and disability prevention are goals for people of all ages until death becomes the preferred option, the priorities placed on those goals in comparison to other goals (eg, current quality of life, personal growth and development, a good death) can change over time and with changes in functional status.⁸ In general though, patients tend to be most concerned about quality of life, and physicians tend to be more concerned with survival. That creates the opportunity for a healthy dialog and more balanced decision-making.

Although individual prioritization may be complex, the payoff can be substantial, a conclusion supported by modeling studies¹³ and at least 2 randomized controlled trials. In the first trial, 200 adults recruited from 2 control and 2 intervention practices completed a comprehensive, self-administered risk assessment questionnaire at baseline and again 1 year later. Included were questions about 215 risk and protective factors and preventive measures already taken. A computer algorithm calculated estimated life expectancy and health expectancy (length of life free of disability), additional years of life obtainable through prevention, a risk-factor-adjusted “real age,” and a list of preventive strategies prioritized by their estimated impact on length of life. Those results were provided to the intervention group and their physicians. After 1 year, the intervention group had gained 13 months of additional estimated life expectancy, whereas the control group gained 5 months ($P < .001$). Rates of counseling on diet, physical activity, seatbelt use, and smoking cessation increased to a greater degree in the intervention group than in the control group.²¹

The second trial enrolled 140 adult patients from a single urban safety-net practice, randomized to an intervention group that received intensive prioritized preventive care informed by another comprehensive risk appraisal tool and a control group that received usual care. At the end of a year, the average gain in estimated life expectancy was 18.7 months in the intervention group compared with 5.1 months in controls, a difference of 13.7 months (95% CI, 6.1, 21.2). Intervention patients achieved greater improvements than controls in alcohol misuse, blood pressure control, use of statins, management of depression, and smoking cessation.²² Although the reasons for the apparent benefits in these studies are speculative, it seems likely that they include improved collaborative

decision-making resulting from focusing on a meaningful, understandable goal (ie, survival), simple metrics (eg, real age, wellness score, estimated gains in life and health expectancies), and comparative benefits of potential strategies.

Focusing more directly on prevention of premature death and disability would also force us to confront our present level of ignorance about the actual causes and how to mitigate them. The aforementioned risk appraisal algorithms were based on either death certificate data or short-term randomized trials. While those data are good enough to serve as a proof of concept, and both of the aforementioned tools have been validated, more accurate tools will probably require more autopsies—both full and noninvasive—more clinical-pathologic analyses, and longer-term investigations of a wider range of potential risk factors (eg, psychosocial, environmental, genetic). Further development, updates, training, and ongoing user support of preventive decision-support algorithms will likely require collaboration between academicians, health systems, software companies, and the federal government (eg, the Centers for Disease Control and Prevention).

Motivation

A goal-oriented approach could also improve both patient and clinician motivation.²¹ The following case is illustrative. Mrs. P was a 67-year-old woman with a variety of chronic medical problems including diabetes, hypertension, and osteoarthritis, all which were more or less “under control.” At a routine follow-up visit, her primary care physician said, “I assume that one of the reasons you come to see me is so I can help you stay alive for as long as possible.” When she agreed, he asked, “What do you still hope to experience before you die?” She began talking about her children and grandchildren, graduations, and marriages. Then he asked, “If you could pick one thing you could do to improve the chances that you will live long enough to experience all those things, what would it be?” She said, “I should stop smoking,” followed by “I am going to do it,” and she did. Her physician had for years encouraged her to stop smoking to reduce her risks for cancer, lung disease, and heart attacks, with no success. He had never helped her to connect smoking cessation to her goal, which was to live long enough to enjoy specific future family milestones and events. Researchers and experienced clinicians have found

that patients are more likely to sustain lifestyle changes when they are tied to current and future quality-of-life goals.^{23–25}

Practicality

We believe that most prevention planning should be separated from acute care and quality-of-life-oriented visits for at least 2 reasons: (1) the process and strategies required to prevent premature death and disability (eg, comprehensive risk assessment and individualized prioritization) are for the most part, different from those required to improve current quality of life; and (2) separation would create greater goal differentiation and clarity, an important component of informed decision-making, motivation, and collaboration.

Development of individualized prevention plans would begin with an assessment of risk factors, strengths, and resources. This could be initiated by patients, as in the 2 trials described previously, and supplemented by both manual electronic record review and automated phenotyping.²⁶ When advanced computerized risk appraisal tools become available, the information could be directly entered and analyzed electronically. An informed discussion with a clinician would then follow, leading to the co-development of an individually prioritized preventive care plan for the coming year.

Because of the extensive analysis of risk factors, including chronic health conditions, and development of comprehensive prevention plans that include chronic disease management (tertiary prevention), these annual prevention planning visits would meet the criteria for Medicare annual wellness visits and the evaluation and management criteria for comprehensive visits (Current Procedural Technology codes: 99205 and 99215). However, more comprehensive prevention codes would be more appropriate and should be developed. Patients would probably think of them as annual physical examinations, but from a motivational perspective they might more appropriately be called “for as long as is possible” (FLIP) visits, visits designed to help patients continue to do and experience the things that they enjoy for as long as possible. The biggest challenge would be fitting FLIP visits for all active patients into the schedule. Of course, such calculations should be used to determine the number of active patients assigned to each primary care physician rather than the converse.

Depending on the elements of the individualized prevention plans, disease-focused decision support methods could be particularly helpful. Clinical pathways could be crafted to provide reminders and assistance to improve the likelihood of success. They would include a set of common modifiable elements, such as who in the practice will monitor progress, what types of support and assistance are to be provided, and an action plan with triggers to prompt adjustments. Time spent supporting preventive strategies could be billed under chronic care management codes. An alternative might be to establish community-based prevention centers, owned and operated by the primary care physicians in a community (similar to ambulatory surgery centers), with facilities, equipment, and staffs needed to help patients carry out their prevention plans.

Value-based metrics could include process measures (eg, periodic comprehensive risk assessment with prioritization, patient-reported person-centered care), potentially high-impact intermediate outcomes (eg, smoking cessation, optimal lifestyle metric),²⁷ and meaningful outcomes (eg, age-adjusted change in estimated life and health expectancy). However, given the unanticipated adverse effects quality metrics have had on person-centered care, we are not promoting their use.

Summary and Conclusions

Refocusing attention from the prevention of individual diseases to the broader goal, prevention of premature death and disability, could improve preventive care in several ways. Tying recommendations to outcomes that matter and are more understandable to patients and using decision-support systems that provide estimates of the benefits could enhance patient motivation. Individual prioritization could increase both effectiveness and efficiency. Goal-oriented preventive care could also inform the development of person-centric quality metrics and guide future research.^{28,29}

To see this article online, please go to: <http://jabfm.org/content/36/2/333.full>.

References

1. Murugan H, Spigner C, McKinney CM, Wong CJ. Primary care provider approaches to preventive health delivery: a qualitative study. *Prim Health Care Res Dev* 2018;19:464–74.
2. Borsky A, Zhan C, Miller T, Ngo-Metzger Q, Bierman AS, Meyers D. Few Americans receive all high-priority, appropriate clinical preventive services. *Health Affairs* 2018;37:925–8.
3. Garbutt JM, Bobenhouse N, Dodd S, Sterkel R, Strunk RC. What are parents willing to discuss with their pediatrician about firearm safety? A parental survey. *J Pediatr* 2016;179:166–71.
4. Cunningham RM, Walton MA, Carter PM. The major causes of death in children and adolescents in the United States. *N Engl J Med* 2018;379:2468–75.
5. Schuster MA, Franke TM, Bastian AM, Sor S, Halfon N [Internet]. Guns in the family: firearm storage patterns in U.S. homes with children. Santa Monica, CA: RAND Corporation; 2001. Available from: https://www.rand.org/pubs/research_briefs/RB4535.html.
6. Centers for Disease Control and Prevention [Internet]. COVID-19 vaccinations in the United States; 2022. Available from: https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-people-additional-dose-totalpop.
7. Centers for Disease Control and Prevention [Internet]. Pediatric data; 2022. Available from: <https://covid.cdc.gov/covid-data-tracker/#pediatric-data>.
8. Mold JW, Looney S, Viviani NJ, Quiggins PA. Predicting the health-related values and preferences of geriatric patients. *J Fam Pract* 1994;39:461–7.
9. Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health* 2003;93:635–41.
10. Østbye T, Yarnall KS, Krause KM, Pollak KI, Gradison M, Michener JL. Is there time for management of patients with chronic diseases in primary care? *Ann Fam Med* 2005;3:209–14.
11. Porter J, Boyd C, Skandari MR, Laiteerapong N. Revisiting the time needed to provide adult primary care. *J Gen Intern Med* 2022. Epub ahead of print.
12. Itoga NK, Tawfik DS, Montez-Rath ME, Chang TL. Contributions of systolic and diastolic blood pressures to cardiovascular outcomes in the ALLHAT Study. *J Am Coll Cardiol* 2021;78:1671–8.
13. Eddy DM, Adler J, Patterson B, Lucas D, Smith KA, Morris M. Individualized guidelines: the potential for increasing quality and reducing costs. *Ann Intern Med* 2011;154:627–34.
14. Mold JW. Goal-directed health care: redefining health and health care in the era of value-based care. *Cureus* 2017;9:e1043.
15. Mold JW. Goal-oriented medical care: helping patients achieve their personal health goals. Chapel Hill (NC): Full Court Press; 2020.
16. Khaw KT, Wareham N, Bingham S, Welch A, Luben R, et al. Combined impact of health behaviours and mortality in men and women: the EPIC-

- Norfolk Prospective Population Study. *PLOS Med* 2008;5:e12.
17. Loisel P, Durand MJ, Berthelette D, et al. Disability prevention. *Dis Manage Health Outcomes* 2001;9: 351–60.
 18. Preventing cognitive decline and dementia: a way forward. Washington (DC): The National Academies Press; 2017.
 19. McGrail MP, Lohman W, Gorman R. Disability prevention principles in the primary care office. *Am Fam Physician* 2001;63:679–84.
 20. Mold JW, Hamm RM, McCarthy LH. The law of diminishing returns in clinical medicine: how much risk reduction is enough? *J Am Board Fam Med* 2010;23:371–5.
 21. Nagykaldi ZJ, Voncken-Brewster V, Aspy CB, Mold JW. Novel computerized health risk appraisal may improve longitudinal health and wellness in primary care. *Applied Clinical Informatics* 2013;5: 75–87.
 22. Applegate M, Scott E, Taksler GB, et al Project ACTIVE: a randomized controlled trial of personalized and patient-centered preventive care in an urban safety-net setting. *J Gen Intern Med* 2021; 36:606–13.
 23. Teixeira PJ, Carraca EV, Markland D, Silva MN, Ryan RM. Exercise, physical activity, and self-determination theory: a systematic review. *Int J Behav Nutr Phys Act* 2012;9:78–108.
 24. Sevild CH, Niemiec CP, Bru LE, Drystad SM, Husebo AML. Initiation and maintenance of lifestyle changes among participants in a healthy life centre: a qualitative study. *BMC Public Health* 2020;20:1006–18.
 25. Welborn TL, Azarian MH, Davis N, Layton JC, Aspy C, Mold JW. Development of an obesity counseling model based upon a study of determinants of intentional sustained weight loss. *J Okla State Med Assoc* 2010;103:243–7.
 26. Alzoubi H, Alzubi R, Ramzan N, West D, Al-Hadhrami T, Alazab M. A review of automatic phenotyping approaches using electronic health records. *Electronics* 2019;8:1235–58.
 27. College for Behavioral Health Leadership [Internet]. Health-related quality of life metrics; 2022. Available from: <https://www.change4health.org/technologies/consumer-e-health-and-health-metrics/tools/health-metrics/>.
 28. Mold JW. Failure of the problem-oriented medical paradigm and a person-centered alternative. *Ann Fam Med* 2022;20:145–8.
 29. Reuben DB, Tinetti ME. Goal-oriented patient care: an alternative health outcomes paradigm. *N Engl J Med* 2012;366:777–9.