Prioritizing Guideline-Recommended Interventions

Imagine that a new patient named "Bill," who is aged 62 years, comes to your clinic for a visit. You want to deliver guideline-recommended preventive care and decide to use the U.S. Preventive Services Task Force (USPSTF) guidelines. More than 10 separate guidelines are relevant to Bill. Following the guidelines, you screen for hypertension, hyperlipidemia, colon cancer, depression, alcohol misuse, depression, diabetes, HIV, obesity, and tobacco use. You learn that Bill is obese; smokes; and has high cholesterol, hypertension, and diabetes. Given his risk factors, USPSTF guidelines indicate that Bill would be eligible for aspirin use to prevent cardiovascular disease; management of obesity, diabetes, and hypertension; and possibly counseling to promote a healthy diet and physical activity. Although the goal is to follow all of the guideline recommendations, it simply may not be possible to do everything. If that is true, which of these guideline-recommended interventions are most important? Will smoking cessation, treatment of diabetes, or weight loss improve Bill's health the most? How can we know, and what metric should we use to decide which interventions provide the most benefit?

How to prioritize what to do in the limited time of a clinical encounter is a pervasive problem in primary care. This question is the topic of an article by Taksler and colleagues in this issue (1). They addressed the question in the context of the benefits that accrue from delivery of preventive services and treatment of conditions identified through those services. The goal of their analysis was to identify which interventions result in the biggest increase in how long Bill and other patients can expect to live.

To do this, Taksler and colleagues developed a mathematical model that estimated how different interventions (for example, treatment of diabetes and weight loss) would change Bill's life expectancy. Life expectancy is the average time a group of people would live, and it is an important measure of health benefit. Changes in life expectancy of 1 year or more are enormous, and even changes in life expectancy of a few days to weeks may be sufficient to justify an intervention (2). For example, biennial screening mammography from age 50 to 69 increases life expectancy by approximately 5 weeks (3). Taksler and colleagues did an admirable job considering all applicable preventive interventions for which the USPSTF has given an A or B recommendation (meaning they are recommended).

The first finding to note is that rather than a life expectancy of 19.1 years, which is expected for an average white man aged 62 years, Bill's life expectancy was only 9.6 years (the life expectancy of an average white man aged 77 years). This dramatically shorter life expectancy highlights the seriousness of Bill's comorbid conditions. Of all of the candidate interventions, the ones with the most effect on life expectancy were control of diabetes (1.8 life-years gained), smoking cessation (1.5 life-years gained), and blood pressure control (1.4 life-years gained). Lowering cholesterol, daily use of aspirin, weight loss, and eating a healthier diet also provided substantial gains in life expectancy. Screening for colon cancer, HIV, and abdominal aortic aneurysms provided much smaller gains. The rank order of the most important interventions change based on the comorbid conditions, ethnicity, and sex of the patient. For example, for a woman with Bill's conditions, control of diabetes dropped from the first- to the fourth-largest effect on life expectancy. The change was because women have lower risks for coronary heart disease.

The value of the tool Taksler and colleagues developed is that it estimated the changes in health outcomes across many interventions and thus enables us to understand the relative importance of different interventions for a specific patient. Although guideline development groups, such as the USPSTF, use models to help develop guidelines, by necessity these models evaluate the effect of 1 intervention (such as mammography) on patients with different characteristics. These models can be very helpful in exploring how screening intervals and age ranges for recommended screening affect benefits and harms of an intervention delivered to different patient subpopulations (4). However, they are not intended to model several diseases or directly prioritize across conditions and interventions.

Modeling the effect of interventions across many diseases is ambitious and requires many simplifying assumptions. As the authors note, their analysis was a proof of concept rather than a fully implemented tool, and there are extensions that would be valuable. They measured benefit in terms of life expectancy, which only accounts for changes in mortality. Other metrics of effect could include a broader set of outcomes. Quality-adjusted life expectancy accounts for both mortality and morbidity and thus would have an advantage as a metric (5). If patients or clinicians were interested in high-value health care (6), the analysis could also account for costs, and interventions could be prioritized based on cost-effectiveness. Regardless of the metric used, some interventions with high potential benefit (such as changing diet or lifestyle and weight loss) may be harder to realize in practice than others (such as blood pressure control), a factor that clinicians will likely consider. Some interventions may have synergies (or diminished benefits) when delivered together, which is another factor that may affect prioritization. In addition, some preventive interventions, such as screening for HIV, have a public health benefit (reduced transmission and consequent health benefits to persons other than the patient) that is not captured in the framework. Finally, an analysis could incorporate detailed patient-specific information and preferences to provide individualized decision support (7). Although there is additional work that can be done, the study makes an important contribution.

Although this study focused on helping clinicians prioritize which guideline-recommended prevention interventions to deliver, the goal of providing all guideline-recommended care remains very important but challenging. Success may require several delivery strategies. Some interventions need not be delivered by physicians and indeed may best be done by other health care professionals (8). While broader strategies are developed to provide all recommended care, the tool developed by Taksler and colleagues has promise to help make sure the interventions with the greatest effect are delivered. Whether its use will improve patient outcomes is a question worthy of further study.

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