With So Many Guidelines, How Does a Physician Practice Evidence-Based Medicine?

By Chuck Dinerstein — January 4, 2018

The Annals of Internal Medicine produced a hat-trick of material on screening for lung cancer, a study, a letter, and editorial. What is the big interest?

The National Lung Screening Trial demonstrated a 20% reduction in lung cancer deaths when persons were screened with low dose computed tomography (a more sensitive test) versus a plain X-ray. This study along with other evidence formed the current national guidelines from the US Preventative Services Task Force (USPSTF).

“The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.”

The study is a cost-effectiveness analysis, how many quality years of life are saved and at what cost? The question posed by the authors is whether the guidelines could be improved upon, by concentrating resources on the patients with the higher risk in this high-risk group. Can we tweak the algorithm?
The authors used eight factors to stratify the high-risk group into increasingly at-risk patients, an individual risk assessment. [1] They reported quality of life years gained (QALY), an economic measure. QALY is the cost of an additional year of good quality life. As the quality of life declines, because of hospitalization, treatment or increasing symptoms, the QALY for the same period will increase. [2]

- As individual risk increased, there was an increasing improvement regarding life’s saved, the years gained and the quality of those years.
- As individual risk increased, costs decreased to diagnose and treat these patients based on life years gained and their quality.
- If society was willing to spend $50,000 for one quality year improvement, no screening demonstrated savings. If the societal commitment increased to $100,000, the USPSTF recommendations were cost-effective.
- Focusing resources on the higher risk patients helped individuals but yield no societal cost benefits.

They concluded that further stratification of patients to identify and help more patients is an appealing notion and will add life years for patients. But, in general, the cost is higher and the life expectancy shorter for these patients. There is no evidence that it is a good economic deal for society.

The letter [3], really an invited commentary, ignores cost and considers only the value of screening to the individual patient. They argue that using personal risk factors would result in screening more patients, and more screening means less premature lung cancer deaths. The letter claims that the evidence shows further stratification is a good deal for individual patients.

Physicians are caught between differing evidence-based medical choices. Do they serve their patient and use individual risk criteria or do they serve society, acting as good stewards of scarce resources and use the national guidelines trading quality life and costs?

The editorial [4], aptly named Model-Based Eligibility for Lung Cancer Screening: Where Theory meets Practice looks for the clinician’s middle ground. Here is the argument:

“… risk-based selection for screening may draw in moderate smokers with a history of 20 to 29 pack-years, who are increasingly prevalent in the United States and still have a great deal to gain from screening. …[but] Persons who are most likely to die of lung cancer … have a shorter life expectancy and lower quality of life regardless of lung cancer, which in turn means that preventing a death in a higher-risk individual translates to fewer QALYs gained than preventing a death in someone at lower risk.”

In actuality, for all the chatter about preventative care and this trifecta of articles, physicians do very little screening for this condition. Among commercial insurance, traditional Medicare and Medicare Advantage, 83,910 beneficiaries were screened in 2015; 1.1% of the eligible 7 million at risk for the second highest cause of death in the US. For comparison in 2015, 101,730 traditional Medicare beneficiaries were screened for abdominal aortic aneurysm, 10% of the at-risk population for the 14th cause of death. Here the editorial makes its strongest point.
“...the more pressing concern is why people, regardless of how their eligibility is defined, are not receiving the test.”

Why indeed? If we are looking for the low hanging fruit of healthcare, being more insistent that we screen patients based on our current guidelines seems a slam dunk. We can research, write and read all we want, but we need to understand better how to improve the use of tools we have already. And we need to recognize that for physicians, looking at patients and their family, not at aggregated numbers, it is sometimes difficult to know which of the guidelines is best.

[1] The individual assessment included age and smoking status as in the guidelines along with “sex, race, family history in a first-degree relative, BMI, smoking exposure since smoking cessation and self-reported history of emphysema.”

[2] QALY = Cost/(years of life gained * quality of that time) Quality of that time ranges from 0 to 1 where 1 is a normal life. For example, QALY=$1000/(2 *1)=500 for every quality year. Having lung cancer reduces quality to 0.72 in this study. QALY=$1000/(2*.72)=694 for every quality year.