

# CORNERSTONE Critiques

Commentary by Richard A. Johnson, MD, on Current Literature

## Cost-Utility Analysis of Screening Intervals for Diabetic Retinopathy in Patients with Type 2 Diabetes Mellitus

Vijan S, Hofer TP, Hayward RA. *JAMA*. 2000;283:889–896.

A major cause of blindness in the United States is diabetic retinopathy. Annual eye-examination screening is generally recommended for patients with type 2 diabetes mellitus and is often used as a measure to assess quality of care. This standard, however, appears to be overzealous, as indicated by a cost-utility analysis conducted by Vijan and colleagues. These researchers suggest that every-other-year or every-third-year screening is nearly as effective as annual screening in most patients with type 2 diabetes mellitus. Applying a Markov cost-effectiveness model to a hypothetical patient cohort based on the US population of diabetic patients older than 40 years from the Third National Health and Nutrition Examination Survey (NHANES-III), the team examined the marginal cost-effectiveness of various screening intervals stratified by patient age and level of glycemic control as determined by hemoglobin A<sub>1c</sub>. The greatest benefit and cost-effectiveness was found in younger patients with the poorest glycemic control. For example, a high-risk patient of 45 years with a hemoglobin A<sub>1c</sub> level of 11% would gain an

additional 21 days of sight if screened annually instead of every third year. A low-risk patient of 65 years with a hemoglobin A<sub>1c</sub> level of 7% would gain an additional 3 days of sight. The researchers further determined that in the high-risk group, annual screening costs an additional \$40,530 per quality-adjusted life-year (QALY) gained and \$211,570 in the low-risk group. In the US population of patients with type 2 diabetes mellitus, conducting retinal screening every year compared with every other year would cost \$107,510 per QALY, whereas screening every other year compared with every third year would cost \$49,760 per QALY gained. The authors conclude that annual retinal screening for all patients with type 2 diabetes mellitus and no previous history of retinopathy is unwarranted; as a universal standard it is not cost-effective and does not confer significant benefit compared with less frequent screening. They recommend that screening intervals for diabetic retinopathy be tailored to each patient according to age, glycemic control, and individual circumstances.

### COMMENTARY

**Vijan et al convincingly show that the uniform recommendation to have annual retinal screening for all adults with type 2 diabetes mellitus produces inefficient outcomes. Their point that this intervention has the greatest utility, in terms of days of sight saved, in the younger and more poorly controlled patient is quite intuitive to any experienced clinician. Problems arise when the various constituents for quality in medicine adopt these types of recommendations as proxy measures of the quality of a physician's care. It is always much easier to deliver quality (recommended) care to those patients who have an active interest in their own disease and keep their process well managed, but in reality it is just these folks who benefit the least from many of our interventions. Targeted interventions make the most economic sense. On the other hand, it would be hard to tell your very motivated diabetic patients with good glycemic control, "Sorry, you don't get to see the ophthalmologist this year, because you have done a good job."**