

# Screening and treatment of diabetic retinopathy was cost-effective

Javitt JC, Aiello LP. Cost-effectiveness of detecting and treating diabetic retinopathy. *Ann Intern Med.* 1996 Jan 1;124:164-9.

## Objective

To determine the cost-effectiveness of screening and treating diabetic retinopathy in patients with diabetes mellitus from the perspective of health insurers.

## Design

Cost-utility analysis using a computerized model of the progression of diabetic eye disease and data from previously published epidemiologic studies and multicentre clinical trials.

## Setting

United States.

## Patients

A theoretical cohort of all Americans in a given age group who develop diabetes in a single year. Age-specific 1988 U.S. population figures predicted that 593 381 people would

develop diabetes mellitus in the United States annually.

## Intervention

In the model, each patient was assessed for disease progression and mortality by age, disease duration, and disease severity. Screening for diabetic retinopathy was assumed to be done according to the guidelines of the American Academy of Ophthalmology, with assessments for proliferative retinopathy and macular edema that used published sensitivities for ophthalmic examination. Patients who were diagnosed with retinopathy or macular edema from data derived from published clinical trials were assigned treatment outcomes of laser photocoagulation compared with no treatment.

## Main cost and outcome measures

Cost per person-year of sight saved and cost per quality-adjusted life-year (QALY) for the average person with diabetes. Costs were expressed in 1990 U.S. dollars using a 5% discount rate.

## Main results

The cost of screening and treating diabetic retinopathy was \$1757 per person-year of sight saved. The cost per QALY for detecting and treating diabetic retinopathy ranged from \$1996 for patients with insulin-dependent diabetes mellitus to \$3530 for patients with non-insulin-dependent diabetes mellitus who do not require insulin. For all patients with diabetes mellitus, the cost per QALY was \$3190. This low cost was maintained after the effect of treatment on QALYs was modified in a sensitivity analysis.

## Conclusion

In the United States, screening for and treating diabetic retinopathy were more cost-effective than most commonly provided medical interventions.

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## Commentary

Diabetic eye disease is a devastating complication of both insulin-dependent and non-insulin-dependent diabetes mellitus. The Diabetes Control and Complications Trial (1), a multicentre randomised trial, convincingly showed that tight glycaemic control substantially reduced the progression of retinopathy related to insulin-dependent diabetes mellitus, both in patients who had not developed retinopathy (primary prevention) and in patients who already had mild retinopathy (secondary prevention). On the basis of these findings, a debate began about how to use intensive therapy regimens in daily practice. Although this emphasis on prevention is warranted, we may have overlooked another important responsibility to our patients: detecting and treating existing eye disease.

Prospective trials indicate that laser photocoagulation is effective in reducing the risk for blindness in persons with diabetic retinopathy. These trials provide the rationale for the study by Javitt and Aiello. Their study makes 2 important contributions to clinical practice. First, they analysed how ophthalmologic screening and the treatment of diabetic retinopathy influenced the quality of life of patients with sight-threatening retinopathy. Second, they evaluated the cost of such a program and expressed the results in a framework that enables us to compare the cost-effectiveness of detecting and treating diabetic retinopathy with that of other health interventions. The methods of the study are sound.

Their results indicate that detecting and treating diabetic eye disease can substantially improve our patients' quality of life

and that screening is an economic bargain. In terms of benefit provided, this intervention is one of the least costly ever studied. The study provides a compelling health and economic rationale for incorporating the detection and treatment of diabetic retinopathy into the care of every patient with diabetes.

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## Reference

1. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. Diabetes Control and Complications Trial Research Group. *N Engl J Med.* 1993;329:977-86.