

Telemedicine Process Used to Implement an Effective and Functional Screening Program for Diabetic Retinopathy

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Abstract

Background:

Diabetic retinopathy, damage to the blood vessels in the retina, is the leading cause of blindness in adults 20–74 years of age. Nearly 300 million people worldwide have diabetes and nearly half of all people with diabetes will develop some degree of diabetic retinopathy during their lifetime. It has been estimated that blindness from diabetic retinopathy is preventable in at least 65% of cases, if detected early. The aim of the project was to develop a flexible, modular, mobile method for screening individuals that could be used effectively in a variety of medical and community settings.

Methods:

Our project created software to support a simple, effective retinal screening process for people with diabetes. The system included four separate software components: registration, imaging, grading, and tracking/reporting. The imaging component consisted of customized software running on a computer attached to a camera that drives retinal image acquisition.

Results:

Seven hundred and six subjects with diabetes were successfully consented, registered, imaged, and had their eye images graded. The mean time for subjects to be registered, imaged, and have eye images graded was 00:12:53. Seventy-six percent of the sample was instructed to follow-up with their eye doctor in 1 year (had no retinopathy or microaneurysms). Only six patients (0.8 %) were asked to see their eye doctor within 6 weeks (proliferative retinopathy or diabetic maculopathy).

Conclusion:

Our project successfully demonstrated that the retinal screening software and workflow process can be used to overcome challenges of providing adequate screening and diagnostic services for people at risk for diabetic retinopathy.

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Abbreviations: (BRFSS) Behavioral Risk Factor Surveillance System, (GIM) General Internal Medicine, (LAN) local area network, (NPDR) nonproliferative diabetic retinopathy, (UPMC) University of Pittsburgh Medical Center

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