Dilation Before Automated Diabetic Retinopathy Screening Performed in the Primary Care Setting

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THE INNOVATION

One-third of US diabetic adults do not receive annual eye exams. Patients with lower income, lower educational levels, and identifying as Black or Hispanic are associated with missing eye examinations.[1,2] Previous research in the primary care setting has also shown that the proportion of ungradable exams is ~30%.[3] To increase the proportion of our primary care diabetic patient panel who received diabetic eye exams, we initially utilized digital fundus photography and automated retinal imaging analysis without performing dilation. Later, because of the high proportion of exams that the software could not interpret, we began offering eye dilation before fundoscopic examination.

WHO & WHERE

The OhioHealth Grant Medical Center Family Medicine practice is a family residency clinic located in Columbus, Ohio. Residents, faculty, and nurse practitioners comprise the 40 clinicians at our clinic. Our patients are primarily covered by Medicaid and are individuals from socially disadvantaged populations.

HOW

In September 2022, we began performing on-site diabetic retinopathy screening without eye dilation using the **Topcon Healthcare TRC-NW400 Non-Mydriatic Retinal Camera** (Topcon Corporation) and the **Digital Diagnostics IDx-DR program** (Digital Diagnostics). We taught physicians and staff to ask patients about prior exams and obtain outside records, employ non-clinical medical assistant staff to perform eye exams, and refer patients with positive screens or uninterpretable results to ophthalmology. Successful processes included identifying patients due for retinopathy screening before appointments and using our electronic health record to remind physicians and staff to perform screening at the point of care. The proportion of our diabetic population with sufficient diabetic retinopathy results (ie, retinal photos the software could interpret as positive or negative) increased from 20% (253/1277) in November 2022 to 35% (429/1225) in May 2023. In May 2023, we observed that 36% of all exams were insufficient and began offering eye dilation to patients aged >64 years and/or patients who had failed previous non-dilated exams. Over the next 8 months, our insufficient exam rate decreased to 22% (82/371); 41% of these exams were performed after dilation. Additionally, our retinopathy detection proportion increased from 11% (September 2023 to May 2023) to 18% (May 2023 to January 2024). Toward the end of January 2024, our overall screening rate was 57% (728/1268) for patients who hadn't been seen in our office in a year and 65% (702/1082) for patients who had been seen in a year.

LEARNING

Our efforts resulted in a substantial and sustainable increase in the number of patients who received diabetic retinopathy screening. The greatest increase in retinopathy screening came after clinic managers began reminding staff through electronic health record reminders to perform screening during appointments. Moreover, offering dilated eye exams to selected patients also led to an increase in the proportion of photographs that the software could interpret. Indeed, before we began dilating, our rate of insufficient exams was similar to previous research, but decreased by roughly one-third after we started dilating. In summary, dilated diabetic retinopathy screening in the primary care setting using in-clinic retinal photographs and automated software interpretation resulted in a large, sustainable increase in diabetic retinopathy screening rates for our underserved patient population.

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Key words: artificial intelligence; diabetic retinopathy; primary health care

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Conflicts of interest: authors report none.

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