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IOP Insight: Integrating Home Intraocular Pressure Monitoring with Electronic Health Records to Enable Data-Driven Glaucoma Care

Glaucoma management is limited by the episodic nature of intraocular pressure (IOP) measurement, which is typically obtained during in-office visits and often misses diurnal fluctuations or peak pressures outside clinic hours.^{1,2} Although home tonometry devices are available, their clinical impact has been limited by poor integration into electronic health record (EHR) systems and the lack of practical ways to incorporate longitudinal IOP data into routine clinical decision-making.³

This proposal describes an integrated digital platform, **IOP Insight**, that connects home tonometry devices directly with the EHR, allowing intermittent measurements to be converted into clinically useful longitudinal datasets. Automated data syncing, visualization dashboards, and flagging of various trends would allow clinicians to review IOP patterns within their normal workflow. In this model, home tonometry becomes part of standard glaucoma care rather than a standalone tool. To improve accessibility, the system could be implemented through a short-term, insurance-supported monitoring period (i.e. a 2-month rental), allowing patients to generate meaningful data without the need for long-term device ownership.

With real-time data integration, this approach allows earlier detection of IOP spikes, better assessment of treatment response, and more individualized management based on true pressure patterns rather than isolated readings.⁴ In many ways, this mirrors the shift seen in diabetes care with continuous glucose monitoring, where longitudinal data replaced single measurements as the basis for treatment decisions. Automated summaries and alerts also reduce the burden of manual data review and help identify patients at higher risk of progression.

From a health economics standpoint, EHR-integrated home IOP monitoring could reduce unnecessary visits, shorten ineffective treatment trials, and help prevent progression to more advanced disease requiring surgical intervention.⁵ Earlier and more precise management may ultimately lower long-term costs while improving patient outcomes. Integration into existing remote patient monitoring frameworks also makes reimbursement and broader adoption more feasible.

This approach builds on existing technology and infrastructure, making it practical to implement. By focusing on interoperability, automation, and usability, it closes the gap between data collection and clinical action, and offers a more modern, data-driven approach to glaucoma care.

References

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