

RESEARCH LETTER

Insights Into Inpatients With Poor Vision: A High Value Proposition

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BACKGROUND: Vision impairment is an under-recognized risk factor for adverse events among hospitalized patients, yet vision is neither routinely tested nor documented for inpatients. Low-cost (\$8 and up) nonprescription “readers” may be a simple, high-value intervention to improve inpatients’ vision. We aimed to study initial feasibility and efficacy of screening and correcting inpatients’ vision.

METHODS: From June 2012 through January 2014 we began testing whether participants’ vision corrected with nonprescription lenses for eligible participants failing a vision screen (Snellen chart) performed by research assistants (RAs). Descriptive statistics and tests of comparison, including *t* tests and χ^2 tests, were used when appropriate. All analyses were performed using Stata version 12 (StataCorp, College Station, TX).

RESULTS: Over 800 participants’ vision was screened (*n* = 853). Older (≥ 65 years; 56%) participants were more likely to have insufficient vision than younger (<65 years; 28%; *P* < 0.001). Nonprescription readers corrected the majority of eligible participants’ vision (82%, 95/116).

DISCUSSION: Among an easily identified subgroup of inpatients with poor vision, low-cost readers successfully corrected most participants’ vision. Hospitalists and other clinicians working in the inpatient setting can play an important role in identifying opportunities to provide high-value care related to patients’ vision. *Journal of Hospital Medicine* 2015;10:311–313. © 2015 Society of Hospital Medicine

Vision impairment is an under-recognized risk factor for adverse events among hospitalized patients.^{1–3} Inpatients with poor vision are at increased risk for falls and delirium^{1,3} and have more difficulty taking medications.^{4,5} They may also be at risk for being unable to read critical health information, including consent forms and discharge instructions, or decreased quality of life such as simply ordering food from menus. However, vision is neither routinely tested nor documented for inpatients. Low-cost (\$8 and up) nonprescription reading glasses, known as “readers” may be a simple, high-value intervention to improve inpatients’ vision. We aimed to study initial feasibility and efficacy of screening and correcting inpatients’ vision.

METHODS

From June 2012 through January 2014, research assistants (RAs) identified eligible (adults ≥ 18 years), English speaking) participants daily from electronic medical records as part of an ongoing study of general medicine inpatients measuring quality-of-care at the University of Chicago Medicine.⁶ RAs tested visual

acuity using Snellen pocket charts (participants wore corrective lenses if available). For eligible participants, readers were tested with sequential fitting (+2/+2.25/+2.75/+3.25) until vision was corrected (sufficient vision: at least 20/50 acuity in at least 1 eye).⁷ Eligible participants included those with insufficient vision who were not already wearing corrective lenses and had no documented blindness or medically severe vision loss, for whom nonprescription readers would be unlikely to correct vision deficiencies such as cataracts or glaucoma. The study was approved by the University of Chicago Institutional Review Board (IRB #9967).

Of note, although readers are typically used in populations over 40 years of age, readers were fitted for all participants to assess their utility for any hospitalized adult patient. Upon completing the vision screening and readers interventions, participants received instruction on how to access vision care and how to obtain readers (if they corrected vision) after hospital discharge.

Descriptive statistics and tests of comparison, including *t* tests and χ^2 tests, were used when appropriate. All analyses were performed using Stata version 12 (StataCorp, College Station, TX).

RESULTS

Over 800 participants’ vision was screened (*n* = 853); the majority were female (56%, 480/853), African American (76%, 650/853), with a mean age of 53.4 years (standard deviation 18.7), consistent with our study site’s demographics. Over one-third (36%,

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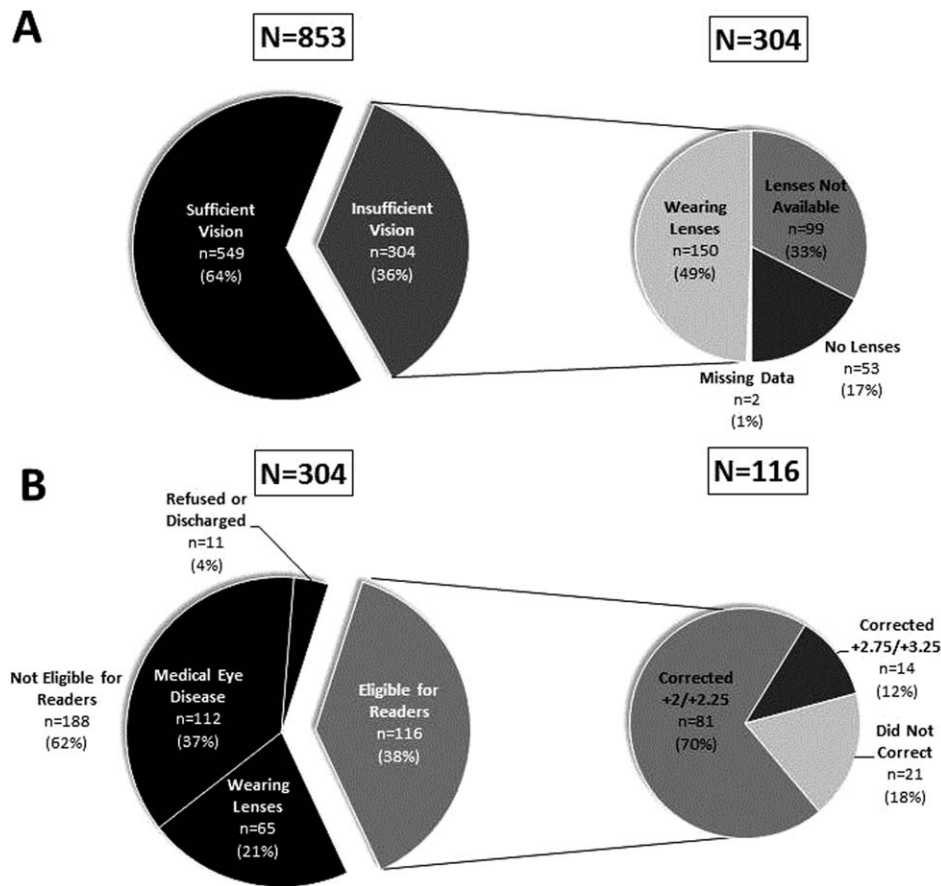


FIG. 1. (A) The proportion of patients screened with insufficient vision. (B) The proportion of eligible patients with vision corrected by readers. Note: percentages may not add to 100 due to rounding.

304/853) of participants had insufficient vision. Older (≥ 65 years) participants (56%, 136/244) were more likely to have insufficient vision than younger participants (28%, 168/608; $P < 0.001$).

Participants with insufficient vision were wearing their own corrective lenses during the testing (150/304, 49%), did not use corrective lenses (53/304, 17%), or were without available corrective lenses (99/304, 33%) (Figure 1A).

One-hundred sixteen of 304 participants approached for the readers intervention were eligible (112 reported medical eye disease, 65 were wearing lenses, and 11 refused or were discharged before intervention implementation).

Nonprescription readers corrected the majority of eligible participants' vision (82%, 95/116). Most participants' (81/116, 70%) vision was corrected using the 2 lowest calibration readers (+2/+2.25); another 14 participants' (12%) vision was corrected with higher-strength lenses (+2.75/+3.25) (Figure 1B)

DISCUSSION

We found that over one-third of the inpatients we examined have poor vision. Furthermore, among an easily identified subgroup of inpatients with poor vision, low-cost readers successfully corrected most

participants' vision. Although preventive health is not commonly considered an inpatient issue, hospitalists and other clinicians working in the inpatient setting can play an important role in identifying opportunities to provide high-value care related to patients' vision.

Several important ethical, safety, and cost considerations related to these findings exist. Hospitalized patients commonly sign written informed consent; therefore, due diligence to ensure patients' ability to read and understand the forms is imperative. Further, inpatient delirium is common, particularly among older patients.⁸ Existing or new onset delirium occurs in up to 24% to 35% of elderly inpatients.⁸ Vision is an important risk factor for multifactorial inpatient delirium, and early vision correction has been shown to improve delirium rates, as part of a multicomponent intervention.⁹ Hospital-related patient costs per delirium episode have been estimated at \$16,303 to \$64,421.¹⁰ The cost of a multicomponent intervention was \$6341 per case of delirium prevented,⁹ whereas only 1 potentially critical component, the cost of readers (\$8+), would pale in comparison.¹ Vision screening takes approximately 2.25 minutes plus 2 to 6 minutes for the readers' assessment, with little training and high fidelity. Therefore, this easily implemented, potentially cost saving, intervention targeting inpatients with

poor vision may improve patient safety and quality of life in the hospital and even after discharge.

Limitations of the study include considerations of generalizability, as participants were from a single, urban, academic medical center. Additionally, long-term benefits of the readers intervention were not assessed in this study. Finally, RAs provided the assessments; therefore, further work is required to determine costs of efficient large-scale clinical implementation through nurse-led programs.

Despite these study limitations, the surprisingly high prevalence of poor vision among inpatients is a call to action for hospitalists. Future work should investigate the impact and cost of vision correction on hospital outcomes such as patient satisfaction, reduced rehospitalizations, and decreased delirium.¹¹

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