Visual acuity, patient-reported outcome measures, or both? The development of an evidence-based appropriateness and prioritization tool for cataract surgery patients

Cataracts are the leading cause of blindness worldwide, with surgery as the only effective treatment.[1] In Ontario, cataract patients are classified into 4 broad priority levels without clear criteria to help guide clinicians in placing patients into categories 3 and 4. Patients in these 2 categories are generally booked on a first-come, first-served basis and comprise the majority of existing waitlists.[2] While visual acuity is objective standard of care and is used in society to categorize patients' vision, it does not encapsulate other factors impacting visual function. Additionally, the appetite for shared decision making in medicine is increasing; we demonstrated only some agreement between what physicians and patients deem important in the prioritization of cataract surgery patients.[3] We observed that patients can have significant visual acuity limitations but not report visual disability, for instance, patients unable to advocate for themselves despite clear signs of impaired visual function. Conversely, some patients with reasonably high contrast visual acuity report visual disability. For example, posterior subcapsular cataracts can cause debilitating glare, yet patients can still read the visual acuity chart well. Therefore, our objective was to explore how clinical measures and patient-reported outcome measures (PROMs) could be used to optimize the prioritization of cataract surgery patients.

Our systematic review concluded that the Catquest-9SF questionnaire was a reliable and valid tool to measure visual function in multiple populations and in multiple languages globally.[1] We further demonstrated that it had excellent psychometric properties in a Canadian population and was responsive to cataract surgery.[4,5] We also created the electronic Cataract Appropriateness and Prioritization tool, which was a modification of the Western Canada Wait List Project.[2] However, it was not as sensitive in differentiating patients with visual impairment and further reaffirmed Catquest-9SF as a robust tool.[4]

Also, because of if its length, we developed an abridged 3-item version of the questionnaire. We first identified 5 items with the highest precision.[4] We chose the easiest item (i.e., an item that someone with poor visual function can accomplish) and most difficult item (i.e., an item that someone with good visual function can have difficulty with) so that respondents with extremes of visual function (very low or high) can be identified. These items were "Do you have difficulty recognizing faces?" and "Are you satisfied or dissatisfied with your present vision?," respectively. Of the 3 remaining medium-difficulty items, we chose the item with the widest variance and that involved an instrumental activity of daily living that impacts quality of life ("Do you have difficulty recognizing prices of goods when shopping?"). The abridged version had precision to distinguish between 2 levels of visual function (low and high) rather than 3 (low, medium, and high).[4]

The coronavirus disease 2019 (COVID-19) pandemic led to cataract surgery cancelations and a greater need to triage surgical cases rapidly and to explore ways to do so virtually. To better match need with surgical supply, we administered the abridged questionnaire to 192 patients in Mississauga, Ontario, with cataract surgery cancelations. We found that using visual acuity or the abridged questionnaire scores to rank these patients significantly changed the waitlist order compared with the original first-come, first-served list (not published). Questionnaire scores and visual acuity were both sensitive to cataract surgery and improved postoperatively. Using the questionnaire to rank patients resulted in greater visual function improvements for those with a higher priority ranking, whereas using visual acuity to rank patients resulted in greater visual acuity improvement for those with a higher priority ranking. Additionally, there was some correlation between preoperative and postoperative visual acuity and preoperative and postoperative questionnaire scores. These findings lead to a discussion of whether visual acuity, PROMs, or a hybrid of both metrics should be considered when prioritizing patients. Using physician-collected data (i.e., visual acuity) is feasible currently, but patient perspectives are not fully captured in the current system.

Given our findings, we propose a tool encompassing both surgeon and patient input (**Fig. 1**). Patients are first screened by their primary eye care provider to determine referral appropriateness. If patients have 20/25 or better vision with no signs of visual disability on the abridged questionnaire, referral should be deferred, and patients should continue follow-up with their primary eye care provider (category 4). Those who have at least some signs of visual disability on the questionnaire and/or any visual acuity diminishment are appropriate for referral. The surgeon repeats the appropriateness screen for referrals. Those appropriate for surgery will subsequently be categorized into 3 groups. Category 1 patients are medically urgent cases and an immediate surgical priority. Category 2A includes legally blind patients (20/200 or worse). Patients who cannot legally drive but are not legally blind (20/60–20/150) are included in category 2B. Patients who have 20/50 or better vision are included in category 2C if they have significant signs of visual disability on the questionnaire. Patients in category 2 who have poor bilateral vision loss generally should be prioritized within each subgroup, though it is unlikely that the category 2 list will be long. Patients who have 20/50 vision or better who do not meet visual disability for category 2C are included into category 3 and ranked

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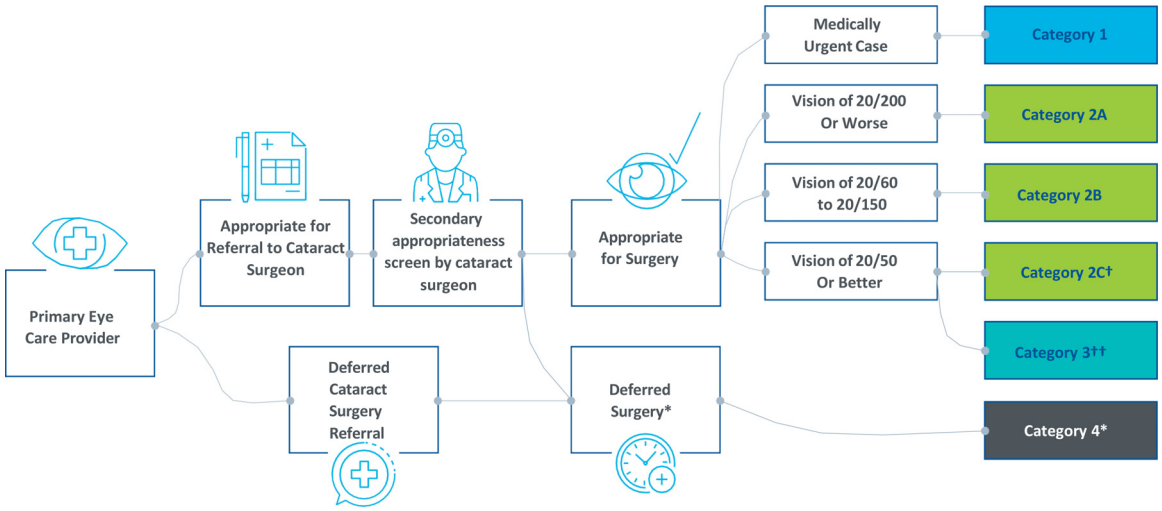

Fig. 1—Cataract surgery appropriateness and prioritization toolkit: an algorithmic approach to categorizing cataract surgery patients using patient-reported outcome measures and visual acuity.

* Patients included in 'Category 4 — deferred cataract surgery referral/deferred cataract surgery' if vision of 20/25 or better AND no signs of visual disability on rapid cataract triage tool. They should continue to follow-up with their referring physician or optometrist.

† Patients included in 'Category 2C' If vision is better than or equal to 20/50 AND signs of significant visual disability on rapid cataract triage tool.

†† Patients included in 'Category 3' if vision is better than or equal to 20/50 AND some signs of significant visual disability on rapid cataract triage tool.

BLUE Box = High Priority, GREEN Boxes = Moderate Priority, TEAL Box = Low Priority and GRAY Box = Deferred Cataract Surgery Referral/Deferred Cataract Surgery.

by visual disability. Questionnaire cut-offs for inclusion into categories 2C and 3 are currently being explored. Clinical judgement still needs to be exercised before categorizing patients into groupings. Additionally, significantly discordant results (e.g., excellent visual acuity and poor questionnaire score) will require further investigation.

Visual acuity groupings were supported by an expert panel in our previous study and societal standards of poor vision (i.e., legally blind and inability to legally drive).[2] Provided that visual acuity is standard of care to categorize vision and has the most meaningful concordance with physician prioritization, we recommend visual acuity as the initial sorting metric for categories 2 and 3, followed by secondary sorting using PROMs.[3]

Further investigations are necessary to build on our model. For example, the logistic details of practically administering this tool remain unknown. The tool also should be piloted in diverse populations. We also hope that our toolkit will improve as we investigate other objective indications of visual function.

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Footnotes and Disclosure

The authors have no proprietary or commercial interest in any materials discussed in this article.