EXTENDED REPORT

Determinants of patient satisfaction with cataract surgery and length of time on the waiting list

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Br J Ophthalmol 2004;**88**:1305–1309. doi: 10.1136/bjo.2003.037721

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Accepted 29 February 2004

Aims: To assess determinants of patient satisfaction with their waiting time (WT) and cataract surgery outcome.

Methods: A prospective cohort of consecutive patients waiting for cataract surgery were assessed by their ophthalmologist. Satisfaction, maximum acceptable waiting time (MAWT), urgency, visual function, visual acuity (VA), and health related quality of life (EQ-5D) were assessed using mailed questionnaires before surgery and 8–10 weeks after surgery. Ordinal logistic regression was used to build explanatory models.

Results: 166 patients (61.9% female, mean age 73.4 years) had a mean WT of 16 weeks. Patients whose actual WT was shorter than their MAWT had greater odds of being satisfied with their WT than those whose WT was longer (adjusted OR 3.86, 95% CI 1.38 to 10.74). Improvement in visual function (OR 3.19, 95% CI 1.78 to 5.73), and VA (OR 4.27, 95% CI 1.70 to 10.68) significantly predicted satisfaction with surgery. Models were adjusted for age and sex.

Conclusion: Patient perspectives on MAWT and satisfaction with WT are important inputs to the process of determining WT standards for levels of patient priority. Patient expectation of WT may mediate satisfaction with actual WT.

Over the past 20 years, with improved technologies and better surgical outcomes, the rate of cataract surgery has increased significantly in Western countries.[1–3] Consequently, long waiting times are a major public concern in countries with publicly funded healthcare systems.[4–8] A number of strategies have been proposed to manage waiting lists, including care guarantees and attempts to set standards for acceptable waiting times for selected services. These strategies have had mixed results.[5 6 9 10]

Priority setting is increasingly being considered to manage waiting lists for elective services.[9 11 12] Prioritisation tools are based on patient urgency and/or capacity to benefit[13] and are intended to improve fairness through providing a standardised explicit method to assess patient priority and thus order patients in the queue.[14–16] Public and clinician input has generally been supportive of the idea of explicit prioritisation.[17 18] Ongoing work in several countries involves evaluating the validity and acceptability of priority scores and setting standards for acceptable waiting times in relation to levels of priority.[11 13 15 19 20]

Little is known of the rationale and evidence used to determine waiting time standards. Factors to consider in their development include clinical evidence, such as the effects of waiting on patient outcomes,[4 21] costs associated with waiting,[22] patient, physician, and public acceptance of waiting time standards,[5] and the availability of resources.[10] Lengthy waiting lists have been linked to decline in visual acuity while waiting,[21 23] and increased costs of home help and hospital stays because of accidents related to reduced vision.[22]

Methods to assess physician, patient, and public perspectives on acceptable waiting times have included expert panels, surveys, and economic techniques.[4 17 18 24–30] Patient perspectives have generally been based on expected waiting times, as they are usually assessed before surgery.[4 25–28] Little is known of the determinants of satisfaction with waiting time for cataract surgery, and the relation of acceptable and actual waiting time to satisfaction.

Although the effectiveness of cataract surgery is well established,[31–35] an estimate of the proportion of patients benefiting from cataract surgery varies with the measure used to measure benefit, as there is little correlation between visual acuity and visual function.[36] This may be particularly relevant in studies that assess the effect of prioritisation on patient outcomes. MacCormick *et al* argue that appropriate patient outcome measures may differ with the underlying ethical framework of priority tools, as outcomes that assess urgency are not necessarily the same as those that assess capacity to benefit.[13] It has been proposed that multiple outcomes should be assessed,[36] and that patient satisfaction with surgery is an important outcome measure to include in the assessment of surgical outcomes.[37]

The purpose of this longitudinal prospective study was to assess determinants of patient satisfaction with the length of wait and satisfaction with cataract surgery.

METHODS

Twelve ophthalmologists at eight hospital sites assessed consecutive patients at consultation for cataract surgery in the Greater Vancouver area, Canada. Our study ran parallel to the current system of prioritising and booking patients for cataract surgery—that is, the priority scores were not used to prioritise patients. The study included patients 18 years of age and over who were placed on a waiting list for elective cataract surgery. Consenting patients were asked to complete mailed questionnaires shortly following the decision to undergo cataract surgery and 8–10 weeks after surgery.

Variables included as potential determinants of satisfaction with waiting time and surgical outcome were age, sex, first or second eye surgery, ocular comorbidity, driving, presurgery measures of urgency and maximum acceptable waiting time

Abbreviations: HRQL, health related quality of life; MAWT, maximum acceptable waiting time; PCS, Priority Criteria Score; VA, visual acuity; VAS, visual analogue scale; VFA, Visual Function Assessment; WT, waiting time.

(MAWT), and change in visual function, visual acuity, and health related quality of life (HRQL). At consultation, ophthalmologists assessed each patient with the Cataract Priority Criteria Tool, developed by the Western Canada Waiting List project to prioritise patients for cataract surgery.[16] The tool includes seven criteria that are combined to produce a measure of patient urgency, the Priority Criteria Score (PCS). Ophthalmologists also rated patient urgency on a 100 mm visual analogue scale (VAS) from 0 ''not urgent'' to 100 ''extremely urgent''. Their perception of MAWT was evaluated with an open ended question: ''In your clinical judgement what should be the maximum waiting time for this patient?'' Waiting time was defined as the time from consultation until the date surgery was completed. Levels of visual acuity were transformed to Snellen fractions (for example, 20/80 = 0.25) for calculation of pre-post difference scores. Post surgery visual acuity was collected from ophthalmologist or optometrist patient records. Actual waiting time was calculated as the time from the booking date to the date surgery was completed.

Patients rated their perception of urgency on a similar VAS urgency scale. To assess MAWT an open ended question was used: ''In your judgement, what should be the appropriate maximum waiting time for you or a person like yourself?'' Visual function was assessed with the Visual Function Assessment (VFA), a slightly modified version of the VF-14.[38] Fourteen items assess the degree of difficulty in performing vision dependent activities of daily living. The summative score ranges from 0 (most difficulty) to 100 (least difficulty). HRQL was assessed with the EQ-5D, a generic preference based measure that has been used to assess the cost effectiveness of cataract surgery.[39–41] Respondents also rated their health status on a 20 cm ''thermometer'' or EQ-5D VAS.

We defined patient satisfaction as a positive evaluation of specific aspects of health care.[42] Patients were asked ''How satisfied are you with the results of your surgery?'' and ''How satisfied are you with the length of time from the day you saw your ophthalmologist until the day you had your cataract surgery?'' Responses were assessed on 5 point scales from 1 (very satisfied) to 5 (very dissatisfied). Patients were also asked to rate their vision compared with before surgery on 5 point scales from 1 (much better now than before surgery) to 5 (much worse than before surgery).

Ordinal logistic regression was used to build explanatory models for satisfaction with waiting time and cataract surgery. Actual waiting time was categorised into three groups: <3 months, 3–6 months, and >6 months. MAWT was split into two groups: 0–2 months and >2 months. Visual acuity, visual function, and HRQL were categorised into three levels: improved, same, and worse. Variables that were significant in the univariate analysis were included in the multivariate analysis. Age and sex were retained in the final models to control for any potential confounding effect. Calculations were performed using STATA version 8 (Stata Corporation, College Station, TX, USA). Non-parametric correlations were used to assess the relation between satisfaction with waiting time and satisfaction with surgery. All statistical tests used a level of significance of <0.05.

RESULTS

Ophthalmologists at consultation assessed 320 patients. Sixty nine per cent were booked for first eye and 31% for second eye cataract surgery. Two hundred and fifty three patients (61.9% female, mean age 73.4 years) consented to participate in the study, resulting in a response rate of 79%. Nine patients had surgery cancelled and four died before study completion. Using t tests and χ^2 tests, there were no significant differences in age or first or second eye surgery between responders and non-responders. Non-responders had a significantly higher PCS (29.2 *v* 23.9) than responders and were more likely to be male. This paper is based on 166 patients who completed both pre and post surgery questionnaires. There were no significant differences in age, sex, length of time waited, or change in visual acuity between responders who did and did not complete post surgery questionnaires.

Mean baseline VFA scores were 77.2 (SD 19.3) and EQ-5D 0.8 (SD 0.2). Eighty three percent had a visual acuity of 20/50 or worse in the operated eye, 37.7% in the non-operated eye, and 34.7% in the best eye. Mean and median actual waiting time from decision date to surgery was 16.4 (SD 10.9) weeks and 11.5 weeks, and patient rated MAWT, 9.4 (SD 6.7) weeks and 8.0 weeks, respectively (table 1).

The majority of patients (62.4%) were very satisfied with their waiting time. Table 2 shows patient rated MAWT, actual waiting time, and the difference in actual and MAWT for levels of satisfaction. The levels ''somewhat'' and ''very'' dissatisfied were collapsed because of small numbers in each cell. Thus the ordinal outcome variable—satisfaction with waiting time—had four levels. The univariate ordinal logistic regression analysis showed that sex, the length of time waited, and patient presurgery ratings of MAWT were significant predictors of satisfaction with waiting time. Age, first or second eye surgery, ocular comorbidity, physician rated measures, driving, perceived urgency (VAS), and change in visual acuity, visual function, or HRQL were not significant predictors.

Age, sex, length of time waited, and patient rated MAWT were all entered into an ordinal logistic regression analysis. Adjusting for the other effects of the other covariates, patients who rated their MAWT greater than 2 months had greater odds of being satisfied with their waiting time (OR 2.40, 95% CI 1.02 to 5.64), whereas patients who had a longer actual wait time had less odds of being satisfied with their waiting time (OR 0.27, 95% CI 0.17 to 0.43). Females had significantly greater odds of being satisfied with waiting time than males (OR 2.08, 95% CI 1.02 to 4.23). There were no significant interaction effects. In a second analysis, the difference in MAWT and actual waiting time was used as a predictor of satisfaction with waiting time. Adjusting for age and sex, patients whose actual waiting time was shorter than their MAWT had greater odds of being satisfied with their waiting time than those whose actual waiting time was longer than their MAWT (OR 3.86, 95% CI 1.38 to 10.74).

Eighty eight per cent of patients were satisfied with surgery (table 3). Of these, 97% rated their vision as much or somewhat better than before surgery. Although improvement in both VA and VFA was associated with higher levels of satisfaction, 18% of satisfied patients had no improvement in VFA scores. Satisfaction with surgery was significantly but weakly associated with satisfaction with waiting time (Spearman $r = 0.37$, $p = 0.000$).

For the logistic regression analysis, the responses ''somewhat dissatisfied'' and ''very dissatisfied'' were combined. Univariate logistic regression analysis showed that age, absence of ocular comorbidity, perceived change in vision, and change in visual function, visual acuity in operated eye, and the EQ-VAS were significant predictors of satisfaction with surgery. These variables were all entered into the multivariate analysis. In the final model, adjusting for age and sex, those who improved in visual function (OR 3.19, 95% CI 1.78 to 5.73) and in visual acuity in the operated eye (OR 4.27, 95% CI 1.70 to 10.68) had greater odds of being satisfied with surgery.

Table 1 Baseline descriptive statistics and actual waiting time

Measures	n	Median	Mean	SD	Minimum	Maximum
Surgeon measures						
Priority Criteria Score (PCS)	164	20.0	23.2	15.2	3.0	82.0
Visual acuity in operated eye*	166	0.3	0.3	0.1	0.0	0.6
VAS urgency	165	45.0	44.6	22.2	0.0	90.0
MAWT (weeks)	165	12.0	15.1	7.9	3.0	48.0
Patient measures						
VFA	166	80.0	77.2	19.3	10.7	100.0
VAS urgency	165	53.0	54.6	23.3	0.0	100.0
EQ-5D index	160	0.8	0.8	0.2	0.0	1.0
EQ-VAS	162	80.0	75.3	17.6	20.0	100.0
MAWT (weeks)	153	8.0	9.4	6.7	1.0	28.0
Actual wait time (weeks)	166	11.5	16.4	10.9	1.6	56.1

*Visual acuity is reported as a Snellen fraction.
VAS, visual analogue scale; MAWT, maximum acceptable waiting time in weeks; VFA, visual function assessment.

DISCUSSION

Our results showed that the majority of patients were satisfied with their waiting time. Satisfied patients waited an average of 3–4 months compared with approximately 7 months for dissatisfied patients. Other studies have shown that cataract patients are generally accepting of wait times of 3 months or less.[4 25] Anderson *et al* reported that only 15% of Canadian cataract patients were willing to pay to shorten their waiting time for cataract surgery[28] whereas Bischai *et al* found that willingness to pay to reduce waiting time varied with perceived wait and country.[27] A Swedish study reported that approximately 90% of cataract patients chose to wait longer rather than go to another hospital with shorter waiting times.[43]

Our study showed that both actual wait time and MAWT had a significant effect on satisfaction with waiting time. In addition, those who had a greater actual wait time than MAWT had significantly greater odds of being dissatisfied. These findings are consistent with the disconfirmation model that asserts that individuals compare their perception of a service against a pre-service level or standard.[44] Satisfaction is mediated by the difference in expectation and performance. Thomson *et al* suggest that performance will be judged by an evaluation of, rather than the actual, waiting time.[45] Individuals may have a point of reference (for example an acceptable waiting time) from which they judge their waiting experience. An MAWT can be viewed as a minimal level of service that an individual expects that may serve as a standard with which the perceived time is compared, resulting in a positive or negative appraisal of the wait. This in turn affects satisfaction with the service.[46]

Other factors that may influence patient satisfaction with waiting are perceived equity and patient information.[47 48] Satisfaction may be related to perceptions that the procedure used to arrive at an outcome is fair. In a survey of the general public Edwards *et al* found that 83% accepted that their waiting time was dependent on the medical and social circumstances of others.[18] While waiting for surgery, many patients are distressed by the lack of information about when they will receive treatment.[49] Naumann *et al* found that notifying patients of their expected waiting time in an urgent care department increased their perception of fairness and satisfaction.[50]

A limitation of our study is that we did not know whether patients were informed of their expected waiting time at the time of assessment and if this knowledge affected their perception of MAWT and satisfaction with waiting time. In addition, results may not be generalisable, as patients and surgeons were those who were willing to participate. However visual function, HRQL, and actual wait times were similar to those in other studies from similar populations.[41 51]

High levels of satisfaction with cataract surgery are consistent with other studies.[32 52 53] Our results show that change in both visual acuity and visual function are significant predictors of satisfaction with cataract surgery. Steinberg *et al* reported that change in VF-14 was the strongest predictor of change in patient satisfaction with vision and that change in the VF-14 correlated more with satisfaction with vision than change in visual acuity.[36 38] In a cross sectional study of patients after cataract, predictors of overall satisfaction were whether preoperative expectation of medical outcome were met, satisfaction with quality of care, and evaluation of patient counselling.[52]

CONCLUSIONS

The processes of prioritisation and setting standards for acceptable waiting times must be seen as transparent and fair to all participants and should involve input from patients, physicians, decision makers, and the public.[18 54] Assessing the patient perspective is particularly relevant in non-life threatening conditions like cataract, where patient benefit is largely related to HRQL. To more clearly understand patient satisfaction with waiting times and cataract surgery, future research should include analysis of patient expectation as it

Table 2 Actual waiting time and patient maximum acceptable wait time for levels of satisfaction with waiting time (weeks)

Satisfaction with waiting time	%	Patient MAWT*		Actual waiting time		Difference†	
		Mean	Median	Mean	Median	Mean	Median
Very satisfied	62.4	9.1	8.0	12.8	9.9	−3.7	−2.9
Somewhat satisfied	19.5	8.5	8.0	17.8	14.9	−9.3	−8.3
Neutral	13.4	12.3	8.0	25.7	28.6	−13.4	−10.4
Dissatisfied‡	4.7	6.1	4.0	28.8	28.9	−22.7	−23.6

*Maximum acceptable waiting time (weeks).
†MAWT minus actual waiting time.
‡"Somewhat dissatisfied" and "very dissatisfied" combined.

Table 3 Change in visual acuity and visual function for four levels of satisfaction with surgery

Satisfaction with surgery	%	Mean change (SD)	
		Visual acuity†	Visual function assessment
Very satisfied	70.4	0.5 (0.2)	15.7 (18.2)
Somewhat satisfied	17.9	0.5 (0.3)	10.4 (14.5)
Neutral	5.6	0.3 (0.3)	−1.0 (13.6)
Dissatisfied*	6.2	0.2 (0.2)	−11.1 (18.3)

*''Somewhat dissatisfied'' and ''very dissatisfied'' combined.
†Visual acuity is reported as a Snellen fraction.

relates to satisfaction. Understanding the determinants of satisfaction with waiting time will provide valuable patient input into the process of setting acceptable waiting time standards.

The underlying ethical and conceptual framework for prioritisation systems needs to be further explored to understand the implications for the use of appropriate outcome measures in the effects of waiting on patient outcomes, the evaluation of prioritisation systems, and the setting of standards for acceptable waiting times. Using multiple patient outcomes for cataract surgery may capture different benefits of surgical outcome and aspects of HRQL.

ACKNOWLEDGEMENTS

This work was sponsored by the Health Transition fund, Health Canada. We gratefully acknowledge the support of Dr Ken Bassett, Director, BC Centre for Epidemiologic and International Ophthalmology, the cooperation of the ophthalmologists and patients who participated in this study, and the valuable contributions of Angela Chang and Kukuh Noertjojo with data collection.

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Br J Ophthalmol 2004 88: 1305-1309
doi: 10.1136/bjo.2003.037721