



## **Measure 303: Improvement in Patient's Visual Function within 90 Days Following Cataract Surgery**

**Reporting Options:** Registry, Cataracts Measures Group

**Quality Domain:** Person and Caregiver-Centered Experience and Outcomes

**Description:** Percentage of patients aged 18 years and older in sample who had cataract surgery and had improvement in visual function achieved within 90 days following the cataract surgery, based on completing a pre-operative and postoperative visual function survey.

**Instructions:** This measure is to be calculated when a procedure for cataracts is performed in the sample during the reporting period. This measure is intended to reflect the quality of services provided for the patient receiving cataract surgery.

**Note:**

- This is an outcomes measure and will be calculated solely using registry data. . You can only include procedures where the patient was distributed all surveys; the preoperative visual function survey **MUST** be provided prior to surgery.
- For patients who receive the cataract surgical procedures specified in the denominator coding in the sample, it should be reported whether or not the patient had improvement in visual function achieved within 90 days following the cataract surgery.
- Include only procedures performed through September 30 of the reporting period. This will allow the postoperative period to occur within the reporting year.

**Denominator Instructions:** Clinicians who indicate modifier 56 (preoperative management) or modifier 55 (postoperative management) only, will not qualify for this measure.

**CPT Codes:** 66840, 66850, 66852, 66920, 66930, 66940, 66983, 66984.

**Note:** CPT code 66982 Complex cataract surgery is not included in this measure.

**Numerator Options:**

G0913 Improvement in visual function achieved within 90 days following cataract surgery

or

G0914 Patient care survey was not completed by patient

or



**G0915** Improvement in visual function **not** achieved within 90 days following cataract surgery

#### **Rationale:**

##### **Scientific basis for measuring visual function outcomes after cataract surgery.**

Visual function has been described as having multiple components, including central near, intermediate, and distance visual acuity; peripheral vision; visual search; binocular vision; depth perception; contrast sensitivity; perception of color; adaptation; and visual processing speed. Visual function also can be measured in terms of functional disability caused by visual impairment. Many activities are affected by more than one of these visual components.

Health services researchers have increasingly emphasized function and quality of life as the outcomes of treatment that are most critical and applicable to the patient. As previously stated, the primary purpose in managing a patient with cataract is to improve functional vision and the quality of life. In well-designed observational studies, cataract surgery consistently has been shown to have a significant impact on vision-dependent function. The Cataract Patient Outcomes Research Team (PORT) reported that 90% of patients under-going first-eye cataract surgery noted improvement in functional status and satisfaction with vision. The Activities of Daily Vision Study of elderly patients with a high prevalence of coexisting ocular and medical diseases reported improved visual function in 80% of patients at 12 months after surgery. A National Cataract Study conducted in England of 1,139 patients who had cataract surgery found that preoperative functional impairment varied in relation to gender, age, and visual acuity. Men were more likely to have trouble with driving, glare, and employment, and women were more likely to have difficulties with activities of daily living and recreational activities. Studies have found that regardless of the preoperative visual acuity in the better eye, most patients reported improvement in their ability to perform visually dependent tasks after undergoing cataract surgery.

Several studies have reported an association between improved visual function after cataract surgery and improved health-related quality of life. Visual function plays an important role in physical function, particularly in terms of mobility. The loss of visual function in the elderly is associated with a decline in physical and mental functioning as well as in independence in activities of daily living, including night-time driving, daytime driving, community activities, and home activities. Elderly patients with visual impairment only (and no other physical or mental impairments) were 2.5 times as likely to experience functional decline than elderly patients without visual impairment.

Improved visual function following cataract surgery can ameliorate the progressive deterioration of quality of life seen in elderly patients. In a cohort of 464 patients 65 years old and older, cataract extraction improved visual function and health-related quality of life. Patients with an improvement in their Activities of Daily Vision Scale (ADVS), a brief measure of vision-specific functional status, had from 10% to 59% less decline in nearly all Short Form (SF)-36 dimensions. The SF-36 is a generic global measure of multidimensional health-related quality of life. A nationally representative



population of 7,114 persons who were 70 years old and older showed that limitations in vision correlated with decreased functional status. The unadjusted functional score of a person with reported poor vision was four times worse than the score for a person with excellent vision. This difference was comparable with the differences found in other chronic conditions such as arthritis. This relationship with vision persisted, even after adjustment for health, demographics, and economic status. Individuals who rated their vision as other than excellent reported worse functional status, even when controlled for the presence of other medical conditions, education, income, general health status, and other symptoms. By improving visual function, cataract surgery may play an important role in preserving overall functional status, reducing associated injuries and accidents, and preventing disability in at-risk elderly patients.

An analysis of the Medical Outcomes Study found that having blurred vision more than once or twice a month has a significant impact on functional status and well-being, particularly on problems with work or other daily activities as a result of physical health. This impact was found to be greater than the impact of several other chronic conditions, such as hypertension, history of myocardial infarction, type 2 diabetes mellitus, indigestion, trouble urinating, and headache. In one study, patients planning to undergo cataract surgery assigned a mean preoperative preference value of 0.68 on a scale ranging from 0 to 1 (where 0 is death and 1 is excellent health), indicating that the visual impairment from cataracts had a substantial impact on their quality of life. Visual impairment is an important risk factor for falls and for hip fracture. Specifically, the Study for Osteoporotic Fractures Research Group found that poor depth perception and decreased contrast sensitivity independently increased the risk of hip fracture.

Visual impairment, in particular a decrease of visual acuity and contrast sensitivity, has been shown to be associated with difficulties in driving. In one study, older drivers with visually significant cataract were twice as likely as older drivers without cataract to report reduction in days driven and four times as likely to report difficulties in challenging driving situations. Drivers with visually significant cataract were 2.5 times more likely to have had an at-fault involvement in a motor vehicle crash in the past 5 years compared with drivers without cataract. This association was significant, even after accounting for other factors such as impaired general health, age, mental status deficit or depression. In this study, visually significant cataract was determined by reviewing the participant's medical record and most recent eye examination by an eye care specialist. The study required that cataract in both eyes was the cause of the visual impairment, based on the medical record; an additional inclusion criterion was best-corrected visual acuity in one eye of 20/40 or worse. A further study in the same group demonstrated that drivers with a history of crash involvement were eight times more likely to have a serious contrast sensitivity deficit (defined as a Pelli-Robson score of 1.25 or less) in the worse eye than those who had no history of crash involvement. A severe contrast sensitivity deficit in only one eye was still significantly associated with crash involvement.

Binocular vision is better than the vision of a single eye. The simultaneous use of the two eyes is complex and requires the integration of disparate images from each eye. A study demonstrated that binocular vision resulted in better perception of form, color, and the relationship of the body to the



environment, which facilitated manipulation, reaching, and balance, particularly under dim illumination. However, if the vision of one eye is reduced due to cataract, visual performance can fall below the level of monocular vision by a mechanism known as binocular inhibition, which reduces patients' visual acuity and contrast sensitivity. A study of the Framingham Study Cohort found that poor vision in one or both eyes was associated with an increased risk of hip fracture also found that patients with good vision in one eye and moderately impaired vision in the other eye had a higher risk of fracture than those with similar visual impairment in both eyes. A study of 150 patients before and after cataract surgery found that poor binocular visual acuity was related to more problems in activities of daily living. Another study, based on patients who reported no beneficial outcomes after first-eye cataract surgery in the National Swedish Cataract Outcome register, found that anisometropia was the reason for the poor outcome in one-third of cases. These studies have shown that second-eye surgery is important to visual and physical function.

In summary, these studies demonstrate that physical function, emotional well-being, and overall quality of life can be enhanced when visual function is restored by cataract extraction.

Improved visual function as a result of cataract surgery includes the following:

- Better optically corrected vision.
- Better uncorrected vision with reduced spectacle dependence.
- Increased ability to read or do near work.
- Reduced glare.
- Improved ability to function in dim levels of light.
- Improved depth perception and binocular vision.
- Improved color vision.

Improved physical function as a critical outcome of cataract surgery includes the following:

- Increased ability to perform activities of daily living.
- Increased opportunity to continue or resume an occupation.
- Increased mobility (walking, driving).

Improved mental health and emotional well-being as a second critical outcome of cataract surgery includes the following benefits:

- Improved self-esteem and independence.
- Increased ability to avoid injury.



- Increased social contact and ability to participate in social activities.
- Relief from fear of blindness.

Most patients achieve improved visual function after cataract surgery. This outcome is achieved consistently through careful attention through the patient selection process, accurate measurement of axial length and corneal power, appropriate selection of an IOL power calculation formula, etc. As such, it reflects the care and diligence with which the surgery is assessed, planned and executed. Failure to achieve this after surgery would reflect patterns of patient selection or treatment that should be assessed for opportunities for improvement.

Sometimes cataract surgery is performed for other medical reasons other than to improve impaired visual function caused by cataract. These circumstances include the following: clinically significant anisometropia in the presence of a cataract; when the lens opacity interferes with optimal diagnosis or management of posterior segment conditions, when the lens causes inflammation (phacolysis, phacoanaphylaxis) and when the lens induces angle closure (phacomorphic or phacotopic). In these situations, improved visual function as a result of the removal of the cataract is not expected, because of the pre-existing comorbid conditions.

### **1. Evidence of a gap in care**

This is an outcome of surgery indicator of direct relevance and import to patients, their families and referring providers. The available evidence suggests that cataract surgery achieves this in about 90% of patients. While the potential for improvement is seemingly small, the volume of cataract surgery in the U.S. of over 2.8 million surgeries means that the impact could affect more than 100,000 patients per year. Ideally, performance on this indicator would be as high as possible, with lower rates suggestive of opportunities for improvement.

### **2. Sampling strategy**

The survey methodology is described as follows. The survey would be administered by a third party (a registry for reporting of PQRS measures) to prevent or minimize bias which might be introduced if it is an in-office paper survey with questions asked by the office staff. Options would be provided to the patient, either online survey, mail survey or phone survey, depending on their preferences and abilities. The survey would be of a sample of those individuals with cataract surgery. The sample size would be postulated at 30, because this is a well-accepted statistical sample and used by the CMS for reporting on measure groups in PQRS. Because visual function is reported at 90 days after surgery, this would allow physicians to identify 30 cases from January – September for reporting purposes.

### **3. Improvement in Visual Function**

The strategy to identify improvement in visual function is as follows. The instrument proposed for visual function evaluation is the Rasch-scaled Short Version of the Visual Function-14, VF-8R. Reliability and validity testing have been performed on the VF-14 as well as the VF-8R. This



instrument is scored on a scale of 0-100, with 0 indicating the lack of ability to perform functional activities and 100 indicating complete ability to perform functional activities. The difference between the pre-operative and post-operative scores on the VF-8R indicates a change in functional activities. Improvement in visual function would be defined as an increase in the visual function score between pre-operative and post-operative assessment on the VF-8R in the range of 5 points or greater.

**Clinical Recommendation Statements:** This is an outcomes measure. As such, there are no recommendation statements in the guideline specific to this measurement topic.