



AOTA Critically Appraised Topics and Papers Series
**Driving and Community Mobility
for Older Adults**

**A product of the American Occupational Therapy Association's
Evidence-Based Literature Review Project*

CRITICALLY APPRAISED PAPER (CAP)

Focused Question

What is the evidence for the effect of interventions to address cognitive and visual function, motor function, driving skills intervention, self-regulation/self-awareness, and the role of passengers and family involvement in the driving ability, performance, and safety of the older adult? Intervention approaches include adaptation, remediation, prevention, and maintenance.

.....
Owsley, C., McGwin, G., Jr., Sloane, M., Wells, J., Stalvey, V. T., & Gauthreaux, S. (2002). Impact of cataract surgery on motor vehicle crash involvement by older adults. *Journal of the American Medical Association*, 7, 841–849.

PROBLEM STATEMENT (JUSTIFICATION OF THE NEED FOR THE STUDY)

State the problem the authors are investigating in this study.

Cataract is the leading cause of vision impairment in older adults in the United States. Cataract causes deficits in acuity and contrast sensitivity and increased disability glare, all factors that may affect the ability to safely drive. Consequently, research has determined that older drivers with cataract are more likely to have a history of recent crash involvement compared with older drivers who are cataract-free, which is mediated by severe contrast sensitivity impairment secondary to increased lens opacity. Because cataract is highly treatable, the authors wanted to explore whether cataract removal is an intervention to improve driving ability.

RESEARCH OBJECTIVE(S)

List study objectives.

Determine the impact of cataract surgery on crash rate in the 4 years following surgery compared with those who have cataract and do not elect surgery.

DESIGN TYPE:

Prospective Cohort Study

Level of Evidence:

II nonrandomized controlled trial

Limitations (appropriateness of study design):

Was the study design type appropriate for the knowledge level about this topic? *If no, explain.*

- Yes Participants were provided with an intervention and cataract surgery and then assessed for ability to drive safely as measured by police-reported crash records, the outcome measure.
- No

SAMPLE SELECTION

How were subjects selected to participate? Please describe.

Consecutive—in the order entering clinic or program. Potential subjects were identified through consecutive chart review for patients seen in these clinics in the prior 6-month period. One group was subjects who chose cataract surgery (intervention group), the other group, which became the control group, chose not to have surgery.

Inclusion Criteria

- Older adults with cataract in 1 or both eyes with acuity of 20/40 or worse (best-corrected, distance)
- No previous cataract surgery in either eye
- Cataract surgery in a least 1 eye had been previously recommended by an ophthalmologist as a treatment for the patients’ visual problems and the subject elected to have the surgery
- Health insurance, either Medicare and/or a private plan
- At least 55 years old
- Living independently in the community
- Licensed to drive in the state of Alabama and had not given up driving. A second group of older adults with cataract were also recruited who met the above criteria, except that the patients did not elect cataract surgery as a treatment for their visual problems. In both groups the primary cause of vision loss had to be cataract as judged by the ophthalmologist or optometrist.

Exclusion Criteria

Individuals with amblyopia required the use of a wheelchair for mobility, and had diagnoses of dementia, Parkinson’s disease, psychosis, or any illness that would likely preclude annual clinic visits for the follow-up period were excluded from the study.

Sample Selection Biases: If yes, explain.

Volunteers/Referrals

Yes

No

Attention

Yes

No

Others (list and explain):

SAMPLE CHARACTERISTICS

N = 277

% Dropouts

#/(%) Male

#/(%) Female

Ethnicity

Disease/disability diagnosis

Check appropriate group:

<20/study group	20–50/study group	51–100/study group	101–149/study group <input checked="" type="checkbox"/>	150–200/study group
-----------------	-------------------	--------------------	---	---------------------

Sample Characteristics Bias: If no, explain.

If there is more than one study group, was there a similarity between the groups?

Yes There were no differences between the groups with respect to the mean number of medical conditions, age, years of education, or the number of miles driven.

No

Were the reasons for the dropouts reported?

Yes Some subjects did not return for follow-up visits 2 and 3 due to serious illness, lack of interest in the study, death, or they had moved away from the location.

No

INTERVENTION(S)—Included are only those interventions relevant to answering the evidence-based question.

Cataract surgery

Add groups if necessary

Group 1

Brief Description	Subjects received cataract surgery and intraocular lens implantation
Setting	Recruited from 12 eye clinics in Alabama
Who Delivered?	Surgeon
Frequency?	One time
Duration?	Length of surgery not reported

Group 2

Brief Description	Subjects elected to not have cataract surgery
Setting	
Who Delivered?	
Frequency?	
Duration?	

Intervention Biases: Explain, if needed.

Contamination

Yes

No

Co-intervention

Yes

No

Timing

Yes

No

Site

Yes

No

Use of different therapists to provide intervention

Yes Surgeons provided the intervention

No

MEASURES AND OUTCOMES—Included are measures relevant to answering the focused question.

Name of measure:

Police-reported motor vehicle crash occurrence involving patients who elected to have surgery compared with those that did not.

Outcome(s) measured (what was measured?):

Number of automobile crashes

Is the measure reliable (as reported in article)?

Yes

No

NR

Is the measure valid (as reported in article)?

Yes

No

NR

NR = Not reported.

How frequently was the measure used for each group in the study?

4- to 6-year follow-up

Measurement Biases

Were the evaluators blinded to treatment status? *If no, explain.*

Yes

No

Recall or memory bias? *If yes, explain.*

Yes

No

Others (list and explain):

Limitations (appropriateness of outcomes and measures) *If no, explain.*

Did the measures adequately measure the outcome(s)?

Yes

No

RESULTS

List results of outcomes relevant to answering the focused question.

Include statistical significance where appropriate ($p < 0.05$).

Include effect size if reported.

Rate ratio adjusted for race, visual acuity, and contrast sensitivity of 0.47 (95% CI, 0.23–0.94) showed that the intervention group had half the crash rate as the control group.

Was this study adequately powered (large enough to show a difference)? *If no, explain.*

Yes

No

Were appropriate analytic methods used? *If no, explain.*

Yes

No

Were statistics appropriately reported (in written or table format)? *If no, explain.*

Yes

No

CONCLUSIONS

State the authors' conclusions that are applicable to answering the evidence-based question.

Individuals with cataract who underwent cataract surgery and intraocular lens implantation had half the rate of crash involvement during the follow-up period compared with cataract patients who did not undergo surgery.

Were the conclusions appropriate for the Study Design (Level of Evidence)? *If no, explain.*

Yes

No

Were the conclusions appropriate for the statistical results? *If no, explain.*

Yes

No

Were the conclusions appropriate given the study limitation and biases? *If no, explain.*

Yes

No

IMPLICATIONS FOR OCCUPATIONAL THERAPY

This section provides guidance about clinical practice, program development, and other implications of the study findings as they relate to the focused question.

Older adults with underlying medical conditions such as cataract require interventions that would treat the condition that is impairing the ability to safely drive a motor vehicle. Therapists need to partner with other medical professionals and refer clients when it is noted that a medical condition is impairing functional performance in ADLs and IADLs. It is interesting to note that even though vision improved by the intervention of surgery, driving exposure declined in a highly similar pattern during the first 2 years of follow-up. These downward trends in driving exposure in these older adults mirror those from national surveys of elderly drivers, and suggest that the amount of driving an older person does may not rebound even when functional impairments are partially reversed, as was the case in this study. It would be interesting to explore why elderly individuals' driving participation declines before proposing interventions to increase driving exposure.

This work is based on the evidence-based literature review completed by Linda Hunt, PhD OTR.

CAP Worksheet adapted from: Critical Review Form – Quantitative Studies ©Law, M., Stewart, D., Pollack, N., Letts, L., Bosch, J., & Westmorland, M., 1998, McMaster University. Used with permission.

For more information about the Evidence-Based Literature Review Project, contact the American Occupational Therapy Association, 301-652-6611, x 2052.



Copyright 2007 American Occupational Therapy Association, Inc. All rights reserved.
For personal or educational use only. All other uses require permission from AOTA.
Contact: copyright@aota.org