



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 TOPIC (CAT)

Focused Question #2

What is the evidence for the effect of policy and community mobility programs (e.g., alternative transportation, walkable communities, education, and pedestrian programs) on the participation of the older adult?

Clinical Scenario:

It is widely accepted that the ability to drive and freely access the community affects the quality of life of older adults. Yet there is growing evidence that as individuals age, the skills required to drive may deteriorate. Consequently, there is growing awareness of the need to regulate the licensing of older drivers, provide education on community mobility programs, and develop accessible transportation. Regulation of driver licensing and renewal for older adults can influence driving status, access to the community and, ultimately, participation in the community. The availability of, access to, and acceptance of transportation options may also affect mature drivers' ability to access the community. Therefore, it is important to identify how policy and community mobility resources influence engagement of older adults. This focused question explores the role of policy and community mobility programs in supporting older adult participation in the community.

Understanding the evidence relevant to this focused question affects occupational therapists in several clinical and professional situations. Information from the focused question could be helpful in the following situations:

- Assisting clients in the identification of transportation options
- Training clients in the use and negotiation of transportation alternative systems
- Advising clients who have a driver license renewal scheduled or did not have a license renewed
- Consulting with a state licensing agency specific to age-based license renewal guidelines
- Fulfilling responsibilities on a state medical review board
- Consulting with transit or community planning organizations in the development of transportation services

Summary of Key Findings:

Summary of Levels I, II, and III

Driver License Policies

- Study examining only vision testing on traffic fatalities (Shipp, 1998) (Level II)
 - Included all state entities with driver licensing in the contiguous United States and the District of Columbia
 - Outcome variable: Fatality Analysis Reporting System (FARS)
 - Results suggest state-mandated vision testing may enhance traffic safety and reduce the economic burden of fatal crashes
 - 1989–1991, an additional 222 fatalities of older adults may have been prevented, saving \$31 million in the 8 states without vision testing
- Study examining state driver licensing renewal policies and the association with fatality rates among older drivers (Grabowski, Campbell, & Morrissey, 2004) (Level II)
 - Included all state entities with driver licensing in the contiguous United States for 11 years
 - Outcome variable: Fatality Analysis Reporting System (FARS)
 - Data revealed that states with in-person renewal had lower fatality rates for drivers aged 85 and older; incident ratio rate .83, 95% confidence interval
 - Drivers aged 65 to 74 had lower fatality rates in states with vision tests; incident ratio rate .92, 95% confidence interval
 - Vision testing, road tests, and varying lengths of renewal period were not statistically associated with fatality rates of older drivers
- Study examining safety effect of age-based relicensure testing between Finland and Sweden (Hakamies-Blomqvist, Johansson, & Lundburg, 1996) (Level II)
 - Examined crash rates between Sweden, which has no age-related screening or medical review associated with license renewal, and Finland, which has strict medical-legal screening associated with license renewal
 - Results revealed significantly different licensing rates between the two countries, with 44.2% drivers over 70 in Sweden licensed, and only 14.6% of people the same age in Finland licensed.
 - Crash and fatality rates between the countries were similar, with no statistical significance reported.
 - Fatalities among older unprotected road users (e.g., pedestrians and bicyclists) was markedly higher in Finland than in Sweden, at an odds ratio greater than two. This was likely due to the large number of individuals restricted to walking and biking after not being relicensed.
- Follow-up study to analyze the existing data from the NHTSA Model Driver Screening Evaluation Program to determine likelihood of a crash for drivers who previously failed and passed a test (Staplin, Gish, & Wagner, 2002) (Level II)
 - Motor-Free Visual Perceptual Test–Visual Closure subtest, Delayed Recall, and Head–Neck Rotation were more valuable in predicting crashes shortly after the tests were administered and decreased predictability over time
 - Trail-Making Test Part B and Rapid Pace Walk were still predictive of crashes 1 year beyond test administration.

- Study investigating the effectiveness of restricted or conditional licensing as measured by crashes and traffic violations rates (Marshall, Spasoff, Nair, & Walraven, 2002) (Level II)

- Analyses revealed that restricted license holders were less likely than drivers with unrestricted licenses to have been involved in crashes and had lower traffic violation rates.

Community Mobility Programs

- Study used program evaluation to demonstrate how surveys identify program elements that have the greatest impact on customer satisfaction (Koffman & Salstrom, 2001) (Level III).

- Researchers used an impact score to determine the relative impact of various aspects of satisfaction.
- The results of the study indicate that ridership by older adults could be increased by adding bus service, and having more reliable equipment and on-time performance.
- Provides a valuable reminder to address issues that are meaningful to the client, which can promote better spending of transit dollars

- Study developed and tested an innovative transportation program called the Independent Transportation Network (ITN) incorporating multiple stakeholders (seniors needing transportation, family members concerned about aging relatives, and the businesses that derive revenue from consumers) (Freund, 2002) (Level II)

- The results indicated that seniors in the Ride & Shop program took significantly more rides to participating merchants than did seniors not in the program.
- Follow-up survey reported overall satisfaction with the program by merchants as well as the older adult study participants.

Summary of Levels IV and V

None included

Contributions of Qualitative Studies:

None included

Bottom Line for Occupational Therapy Practice:

There is a growing need for occupational therapists working in the area of driving rehabilitation and community mobility.

Numerous clinical and consultative roles for occupational therapists exist to support or supplement license policy changes. These changes include:

- Policies supporting additional testing, monitoring, and restrictions will increase the need for occupational therapy driving evaluation and community mobility services;
- Therapists educating policy makers about the questionable nature of any screening tool to definitively identify high-risk older drivers during the policy development phase of state level work;

- Occupational therapists working with state driver licensing agencies and medical review boards stressing the inability of any single test to determine driving safety, and the risks of a strict cut-off score on any test into a state guideline;
- Occupational therapy services identifying transportation alternatives, providing travel training for new alternate transportation users, and generating a plan to continue occupational engagement despite access to a private automobile;
- Occupational therapists assisting with the design of screening programs and licensing personnel training; and
- Providing periodic physical examination, road testing, and cognitive testing or vision assessment so the most appropriate restrictions can be imposed when jurisdictions necessitate licensing restrictions.

As the number of older drivers increases, the number of occupational therapists specializing in driving rehabilitation will increase proportionally. Furthermore, practice opportunities specific to community mobility and assisting older adults' participation in community life will increase. Occupational therapists working in general practice and driver rehabilitation settings need to fully understand community mobility options and the application process, as well as operation and limitations of the area programs when making recommendations for specific clients. Efficient referral pathways need to be established to expedite transition to driving cessation without gaps in community mobility. In addition:

- Practitioners are needed to work with transit agencies in the modification of programs for clients with dementia and other cognitive deficits who need a more structured, supervised use of the system;
- Occupational therapists can provide the necessary training and orientation to agency staff, schedulers and drivers in the areas of sensitivity training, transfer training, driver safety, and use of vehicle safety features among drivers and passengers for injury prevention; and
- Occupational therapy can play a key role in developing programs to support engagement in meaningful community occupations in the community by means of safe mobility within the community through comprehensive pedestrian safety, bicycle safety, and roadway design programs.

Educational and Training Implications

- Educational and training programs need to recognize driving and community mobility as an instrumental activity of daily living.
- Evidence-based findings related to policy and community mobility should be incorporated into the training of occupational therapy practitioners.

Research Implications

Further research is needed to identify the impact of policy and community mobility programs on occupational engagement. These studies should focus on outcomes and could examine:

- Which occupations clients are able to continue to engage in when using transportation alternatives
- Quality of life when using transportation alternatives
- Changes in occupational engagement in the community under strict license renewal policies
- Percentages of older adults choosing to surrender a license prematurely under strict license renewal resulting in decreased occupational engagement in the community
- The impact on community transportation programs in jurisdictions with strict license renewal
- Differences in occupational engagement between drivers with restricted licensure versus license revocation

Review Process

Procedures for the selection and appraisal of articles

Inclusion Criteria:

- Peer-reviewed journals from 1980 to 2004
- Evidence-based reviews (e.g., Cochrane Database of Systematic Reviews)
- Published reports (e.g., Transportation Review Board)

Exclusion Criteria:

- Level IV and Level V studies
- Dissertations
- Conference proceedings
- Book chapters

Search Strategy

Categories	Key Search Terms
Patient/Client Population	Elderly, Older Driver, Aging
Intervention	Public Transportation, Communities, Ground Transportation, Physical Mobility, Environment, Transportation, Transportation Needs, Pedestrians
Comparison	Filter developed by McMaster; research study terms
Outcomes	Not included in the search

Databases and Sites Searched

MEDLINE, AGELINE, TRIS Online, Ergonomics Abstracts, PsycINFO, SocioFile, CINAHL
Hand searching of bibliographies of selected articles

Quality Control/Peer-Review Process:

- The coordinator of the project developed search terms in consultation with authors of each question and advisory group.
- A medical research librarian conducted all searches to confirm and improve search strategies.
- Medical librarian and coordinator of project discussed the searches and findings, to ensure that key articles or areas of research had not been overlooked.
- The question author completed the CAP worksheet for each article that met the inclusion criteria. The coordinator of the project reviewed the article and the completed CAP to look for unanswered questions and discrepancies in interpretation of the results and to ensure that the implications were clear.
- The CAT was written by the author of the question. It was then reviewed by the coordinator of the project, an expert in the area of older adult driving and AOTA staff.

Results of Search:

Summary of Study Designs of Articles Selected for Appraisal

Level of Evidence	Study Design/Methodology of Selected Articles	No. of Articles Selected
I	Systematic reviews, meta-analysis, randomized controlled trials	0
II	Two groups, nonrandomized studies (e.g., cohort, case-control)	6
III	One group, nonrandomized (e.g., before and after, pretest, and posttest)	1
IV	Descriptive studies that include analysis of outcomes (e.g., single-subject design, case series)	0
V	Case reports and expert opinion, which include narrative literature reviews and consensus statements	0
	Qualitative studies	
		TOTAL = 7

Limitations of the Studies Appraised

Levels I, II, and III

Measuring crash data (e.g., fatalities, and “at-fault crashes” and violation records) are not sufficient in capturing all of the motor vehicle events that occur, particularly in a population that may attempt to hide incidents to preserve license privilege. When comparing driving safety in two countries, differences in traffic regulations and driving conditions were not included in the analysis. A limitation of cross-sectional surveys (Level III) is that it is difficult to know the timing in the relationship of variables. Lack of randomization of intervention studies, lack of cost-benefit analysis, and increased use of services in intervention group may be due to increased attention paid by family members sponsoring rides; numbers of seniors participating in project not reported.

Levels IV and V

Not included in review

Articles Selected for Appraisal

Freund, K. (2002). *Pilot testing innovative payment operations for independent transportation for the elderly* (Final Report for Transit-IDEA Project 18). Washington, DC: Transportation Research Board.

Grabowski, D. C., Campbell, C. M., & Morrissey, M. A. (2004). Elderly licensure laws and motor vehicle fatalities. *Journal of the American Medical Association*, *291*, 2840–2846.

Hakamies-Blomqvist, L., Johansson, K., & Lundburg, C. (1996). Medical screening of older drivers as a traffic safety measure: A comparative Finnish-Swedish evaluation study. *Journal of the American Geriatrics Society*, *44*, 650–653.

Koffman, D., & Salstrom, R. (2001). *How to best serve seniors on existing transit services* (MTI Report 01-04). San Jose, CA: San Jose State University, College of Business, Mineta Transportation Institute.

Marshall, S.C., Spasoff, R., Nair, R., & Walraven, C. (2002). Restricted driver licensing for medical impairments: Does it work? *Canadian Medical Association Journal*, *167*, 747–751.

Shipp, M. D. (1998). Potential human and economic cost-savings attributable to vision testing policies for driver license renewal, 1989–1991. *Optometry and Vision Science*, *75*, 103–118.

Staplin, L., Gish, K. W., & Wagner, E. K. (2003). MaryPODS revisited: Updated crash analysis and implications for screening program implementation. *Journal of Safety Research*, *34*, 389–397.

This work is based on the evidence-based literature review completed in August 2005 by Wendy B. Stav, PhD, OTR/L, SCDCM.

CAT format adapted from a template provided by Dr. Annie McCluskey and freely available for use on the OT-CATS website (<http://otcats.com>)

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



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