Older Driver Self-Screening and Functional Assessment

David W. Eby, PhD

Senior Mobility Awareness Symposium: Science, Policy, and Practice

December 6, 2012

UNIVERSITY OF MICHIGAN

Introduction

- **Aging does not lead to declining abilities that are needed for safe driving.**

- **Rather, there are a number of medical conditions and other factors that are more likely occur in the older adult population and are, therefore, associated with aging.**

- **Indeed, it is not the medical condition itself that raises the risk of a crash, but rather how the condition influences functional abilities—those abilities that underlie critical driving skills.**

- **Categories of functional abilities: Cognition, vision, and movement.**

Older Driver Evaluation

- **One of the most controversial topics in maintaining safe mobility in an aging society is the evaluation of an older person's fitness-to-drive.**

- **Evaluation involves screening and assessment;**

- **Screening:**
  - **First step in an multi-tiered process;**
  - **Home/community, clinical setting, and/or licensing agency;**
  - **Not the basis for licensing decisions.**

- **Assessment:**
  - **In depth and provides basis for understanding functional declines;**
  - **Used for licensing decisions.**

Goals

- **Our research/program goals:**
    - Keep older adults driving for as long as they can safely do so;
    - Provide safe and acceptable community mobility options for older adults who don't drive.
- **Screening and functional assessment play a critical role for this first goal.**
- **Self-screening is the process by which an individual privately completes a test or questionnaire and gains awareness of potential declines that can affect safe driving and other knowledge.**

Self-Screening

- **Advantages:**
    - **non-intrusive and, therefore, less threatening than other types of screening;**
    - **people may be more likely to be screened earlier in disease onset, resulting in earlier detection of functional declines;**
    - **self-screening tools are easily and cheaply distributed resulting in widespread availability.**

- **Disadvantage:**
    - **Not useful and potentially dangerous for cognitively impaired persons.**

Self-Screening Instruments

Name	Format	Reference/Availability
Driving Decisions Workbook*	Booklet	Eby et al. (2003) http://hdl.handle.net/2027.42/1321
Creating Mobility Choices: Older Driver Skill Assessment and Resource Guide	Booklet	AARP (1992) No longer available.
Drivers 55 Plus: Check Your Own Performance	Booklet	AAA Foundation for Traffic Safety (1994). http://www.aaafoundation.org/pdf/driver55.pdf
Safe Driving for Older Adults	Booklet	National Highway Traffic Safety Administration (2003). http://www.nhtsa.gov/people/injury/olddrive/OlderAdultswebsite/index.html
How Is Your Driving Health? A Self-Awareness Checklist & Tips to Help You Drive Safely Longer	Booklet	Staplin et al. (2003a, 2003b) http://www.nhtsa.dot.gov/people/injury/olddrive/modeldriver/1_app_c.htm
The Older and Wiser Driver	Booklet	AAA Foundation for Traffic Safety (1997). http://www.aaafoundation.org/pdf/older&wiser.pdf
Roadwise Review	Computer/Web Based	AAA Foundation for Traffic Safety Staplin & Dinh-Zarr (2006) http://www.aaafoundation.org/home/
SAFER Driving: The Enhanced Driving Decisions Workbook*	Web-Based	Molnar et al. (2010) http://www.um-saferdriving.org

* Evidence-based instruments produced by UMTRI

Driving Decisions Workbook

- **Sponsor: General Motors/NHTSA**
- **Validated instrument that gives individualized feedback on potential driving problems and what can be done to continue driving safely.**
- **Details:**
  - **Questions/feedback were written based upon literature review and expert knowledge.**
  - **Pilot tests were conducted at various critical points during development.**
  - **Designed to give appropriate feedback based upon respondent's answers.**
  - **Written at the 8th grade reading level.**
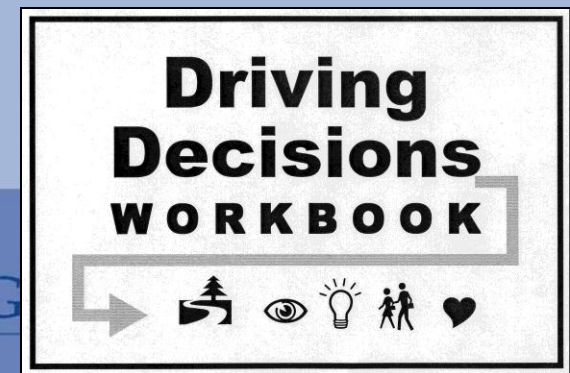
Driving Decisions Workbook

Questions:

In the past year, have you dozed or "nodded off" for a moment while driving?

    No   *Yes*

In the past year, have you had to open the window, play the radio, or have a passenger talk with you in order to stay alert while driving?

    No   *Yes*

How stressful for you is driving long distances?

   *Not at all*   *Not very*   *Somewhat*   *Very*

Feedback:

You may get overly tired while driving. Older drivers are especially prone to "highway hypnosis" with increased blinking, dozing off, lapses in time not remembered, voices and sounds that seem far away or louder than normal, and your car slowing down without your awareness that you let up on the gas.

- Start out well rested—don't drive if you are tired or sleepy.
- Pace yourself—take a break every 1-2 hours on long trips.
- Get out of the car and stretch or walk on breaks.
- Drink plenty of water.
- Increase your strength and flexibility by exercise to help prevent tiredness.
- Ask someone else to drive when tired.
- Remember that most methods people use to stay awake while driving only work for a short period of time, and sometimes not at all.

Driving Decisions Workbook Study

- **Evaluation/Validation study:**
  - **99 licensed drivers: 65-74; 75-up**
  - **Recruitment: advertisement**
  - **Valid driver license and no major cognitive impairment.**
- **Participants completed DDW**
- **Participants completed a comprehensive assessment including on road test.**
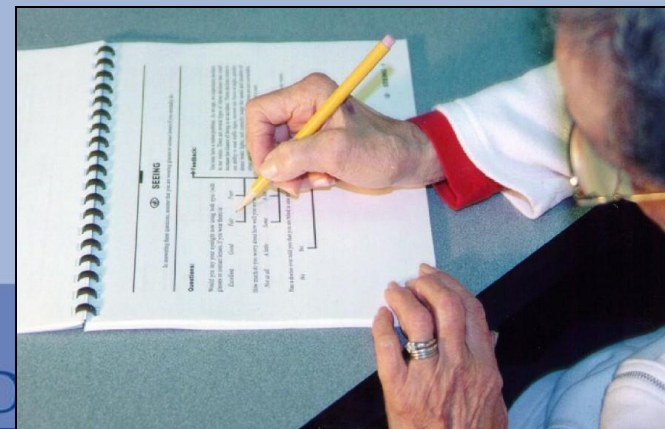
Driving Decisions Workbook Results

Mean Duration (Minutes) and Standard Deviation (SD) to Complete the Workbook.		
Category	Mean	SD
Overall	30.5	11.8
Men	31.1	11.5
Women	30.1	12.1
65-74	27.5	10.0
75-up	34.3	12.9

Driving Decisions Workbook Results

Spearman Correlations Between Workbook and Driving	
CATEGORY	Driving
Overall	.30
Health	.15
Conditions	.23
Medications	.08
Abilities	.35
Vision	.16
Cognition	.39
Psychomotor	.35
Experiences	.21

Driving Decisions Workbook Study

- 75% indicated that the workbook made them more aware of changes that affect driving.

- 15% discovered a change they had not known about previously.

- 24% indicated that they were planning to make a change in they way drove.

- 41% reported that they were more likely to take a driving refresher course.

- 36% reported that they were more likely to have a doctor evaluate their abilities.

Driving Decisions Workbook Study

- **Nearly 100% of respondents:**

    - **thought it was a useful reminder;**

    - **would recommend it to a friend/family member;**

    - **thought it would be useful for older adults with discussion in their family.**

- **The *Driving Decisions Workbook* has the potential to be an effective screening tool for helping to maintain safe and effective older person mobility**

SAFER Driving

- **We sought to improve upon existing self-screening instruments, in particular the *Driving Decisions Workbook*.**

- **Evaluation of the DDW showed that the objective driving performance did not correlate significantly with self-reported medical conditions.**

- **Instead, we focused on the "health concerns" that affect driving– that is, the symptoms that people experience due to medical conditions, the medications used to treat them, and the general aging process.**
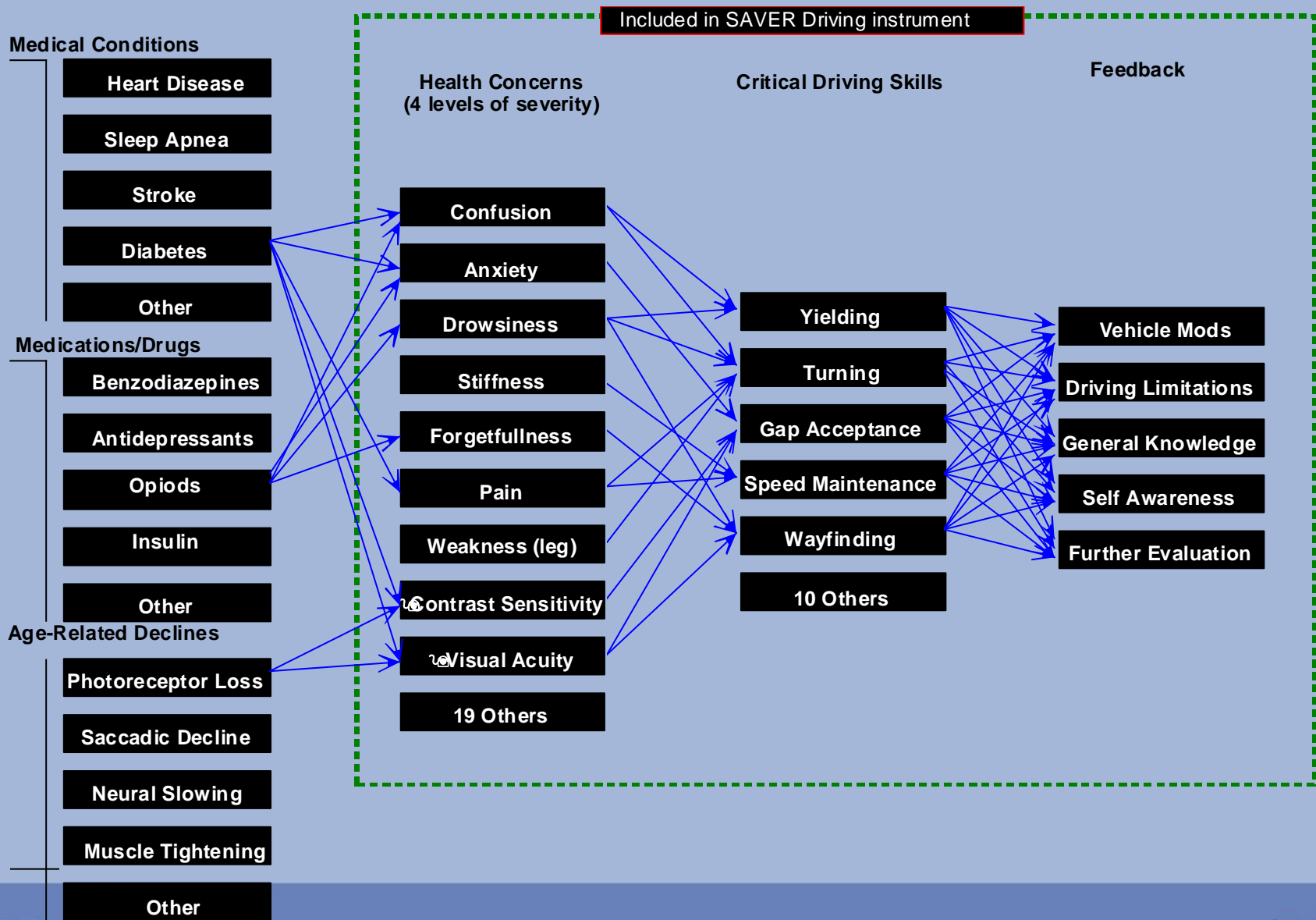

SAFER Driving:
The Enhanced Driving Decisions Workbook
The University of Michigan Transportation Research Institute and The UM Drive-Ability Program

- Font Size | + Font Size | About

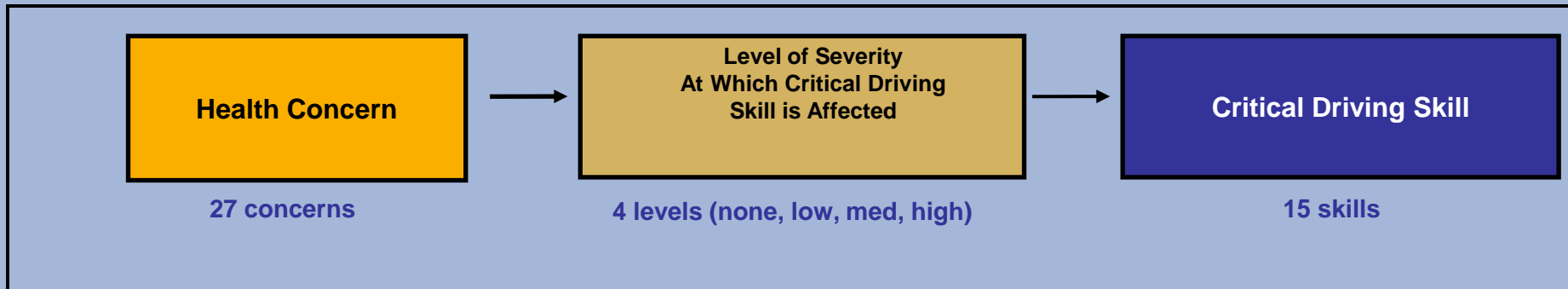(**S**elf-**A**wareness and **FE**edback for **R**esponsible **D**riving)

SAFER Driving: Development Tasks

- **Review of literature and discussion with experts to identify common health concerns and critical driving skills.**

- **Expert meeting to discuss linkages between health concerns and driving tasks at various levels of impairment.**

- **Development of feedback and questions.**

- **Development of user-friendly web-based self-screening instrument with focus group input.**

SAFER Driving

- **27 common health concerns identified:**
  - ➢ **13 cognitive; 7 motor; 7 visual**
- **15 critical driving skills identified.**
- **Health concerns linked to driving tasks at none, low, medium, and high levels of impairment, depending on concern**

Health Concern	Level of Severity At Which Critical Driving Skill is Affected	Critical Driving Skill
27 concerns	4 levels (none, low, med, high)	15 skills

Web Site Logic

- **Assess level of severity experienced by user of self-screening instrument for each health concern.**
  - The question responses are mapped to one of the four levels of severity based on how the questions are answered.
  - Each health concern is measured by three to five questions.
  - Severity level is determined by modal response; if there is no distinct mode, then the median is used.

- **Determine which critical driving skills are affected by user's health concerns.**
  - The mappings from health concern severity level to effect on critical driving skill was determined by an expert panel.

Web Site Logic

- **Calculate overall score and three sub-scores for each critical driving skill.**
  - These scores, along with a threshold (≥25%), determine whether a person gets feedback on that critical driving skill.
- **Determine the set of health concerns for which the person will get feedback.**
- **Provide individualized feedback.**
  - Individualized lists of potential health concerns, potential critical driving skills affected, and tips for safer mobility given these health concerns and potential driving problems are prepared and presented to the respondent.

Validation/Evaluation

- **68 licensed drivers recruited from patient pool referred to UM Drive-Ability Program and postings for volunteers;**
  - ½ male; ½ age 65-74; ½ age 75 and older
- **Study administered at UM Drive-Ability Program by OT/certified driving rehabilitation specialist;**
- **Participants completed web-based self-screening instrument and follow-up questionnaire;**
- **Participants completed comprehensive driving assessment (clinical and on-road; 3.5 hours);**
- **Self-screening results were compared to clinical evaluation and on-road assessment results.**

Results: Self Awareness

Percent of Respondents Agreeing With Statements					
	Overall	Men	Women	Age 65-74	Age 75+
The workbook made me more aware of changes that can affect driving.	76.2	72.7	80.0	81.3	71.0
I discovered changes in myself that I had not been aware of before.	37.7	34.4	41.3	40.6	34.5
The feedback served as a useful reminder of things I already knew.	93.8	94.0	93.5	93.9	93.5
As a result of the workbook, I plan to make changes in the way I drive.	41.9	37.5	46.6	50.1	33.4
As a result of the workbook, I plan to consider modifying my vehicle.	11.3	9.1	13.8	12.5	10.0
I am thinking about taking a driving refresher course or how a course might benefit me.	33.3	25.1	42.0	39.4	26.6
I am now more likely to discuss health concerns I am experiencing with my doctor.	52.5	48.5	56.6	51.5	53.3

Results: Usefulness

Percent of Respondents Agreeing With Statements					
	Overall	Men	Women	Age 65-74	Age 75+
If available, I would be likely to use the workbook in the future.	76.6	69.7	83.9	72.8	80.7
I would recommend the workbook to older adult friends or family members.	92.2	87.9	96.8	93.9	90.3
The workbook would help older adults talk about driving concerns with their families.	93.7	90.9	96.7	93.9	93.5
Overall, I would rate the usefulness of the workbook as:					
Extremely Useful	36.5	36.4	36.7	36.4	36.7
Moderately Useful	47.6	42.4	53.3	48.5	46.7
Somewhat Useful	12.7	15.2	10.0	15.2	10.0
Not at all Useful	3.2	6.1	0.0	0.0	6.7

Results: Validation

Correlations Between Self-Screening Instrument-Identified Health Concerns, On-Road Driving Performance, and Clinical Evaluation					
	Overall	Men	Women	Ages 65-74	Age 75+
Instrument versus On-Road Driving	-.26	-.34	-.22	-.02	-.44
Instrument versus Clinical Evaluation	.26	.30	.35	-.07	.54

Conclusions

- **Both the Driving Decisions Workbook and The *SAFER Driving: Enhanced Driving Decisions Workbook* appear to be a useful and valid self-screening/self-awareness instruments for older adult drivers.**

- **The tools are free and in the public domain:**
  Driving Decisions Workbook
  http://deepblue.lib.umich.edu/handle/2027.42/1321

  SAFER Driving
  http://um-SAFERdriving.org.