Risk Impairment Assessments and Driving Programs: Lessons Learned from the Seniors on the M.O.V.E Program

Dr. Vanya Jones, PhD, MPH

The Seniors on the M.O.V.E. (Mature Operators Vehicular Education) Feasibility Study
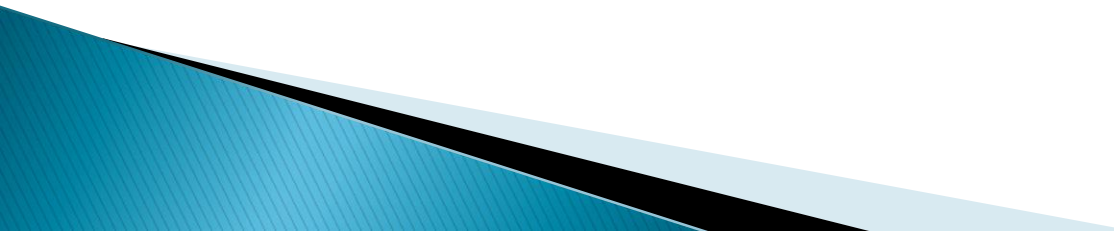
Seniors on the M.O.V.E.

SOM

Four sequential classes; two hours each

- PowerPoint based classroom instruction; no in car driving component
- Optional 5th CarFit session

Study Funded in part by The Erickson Living Foundation and the Maryland Motor Vehicle Administration.
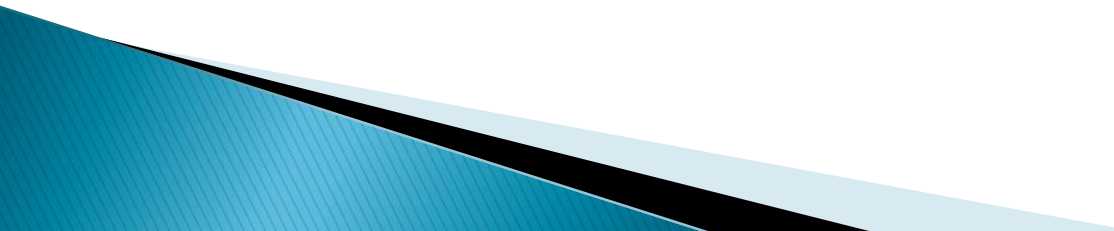
SOM Sessions

1. Self Assessment
2. Driving Skills
3. Medicine and Driving
4. Occupation Protection
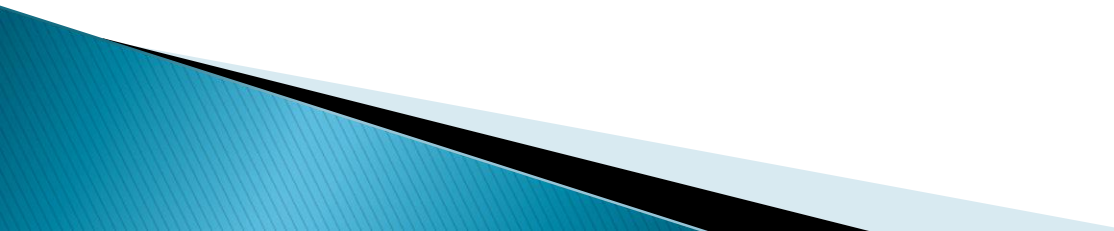5. Car Fit

Seniors on the M.O.V.E Feasibility

1. Implement a screening protocol to triage older adult drivers into risk categories – "Low", "Medium" and "High"

2. Examine the impact of being screened as high risk

Seniors on the M.O.V.E
Sample Population

- Senior Drivers 60+
- Residing in one Baltimore County housing facility
- Drives at least one time a week for the past year
- Has a valid Maryland Drivers License

Study Design

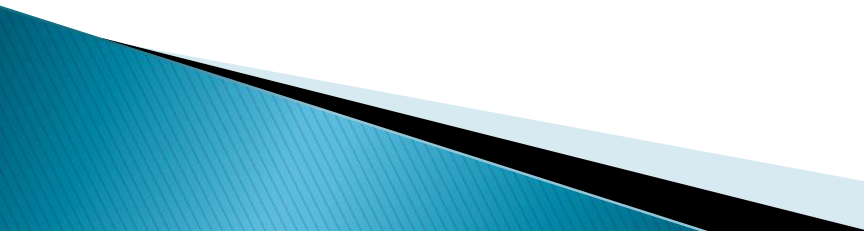- Recruitment
- Consent
- Mini Mental Screening
- SOM Screening
- Interview for High Risk Participants
- SOM Intervention for non-High Risk Participants
- JHSPH IRB Approved, Erickson Living Foundation Research Committee Approved

Intervention & Assessment Flow Chart

| High Risk | → Recommend
• Physician
• Rehabilitation
• MVA's MAB |

Baseline Screen

Move Intervention (Intervention A)

Randomized to Intervention A or B

Sessions:				
1	2	3	4	5
Road Wise Review	Road Smart	Me & My Vehicle	Medwise	CarFit

Low Resource (Intervention B)

Sessions:				
1	2			5
Road Wise Review	Optional			CarFit

[T1] Screen   [T2] Pre Assessment   [T3] Post Assessment 1   [T4] Post Assessment 2
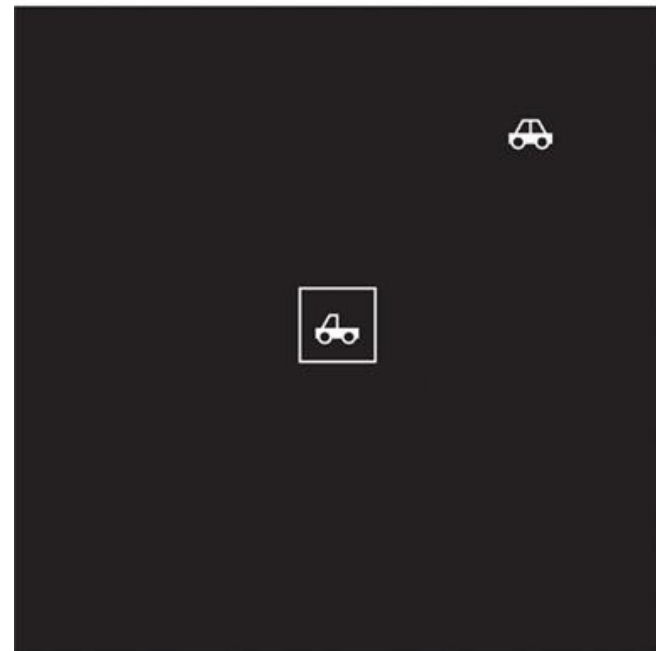
MVA Record Assessment

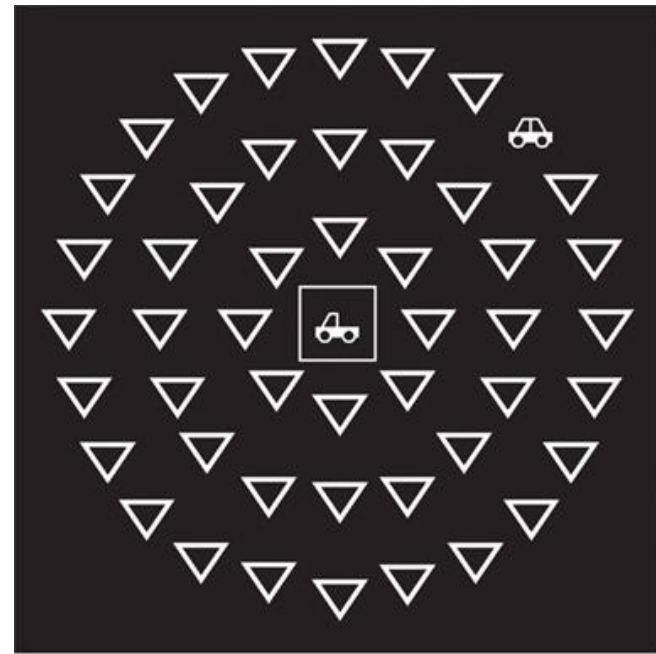# Low, Middle, and High

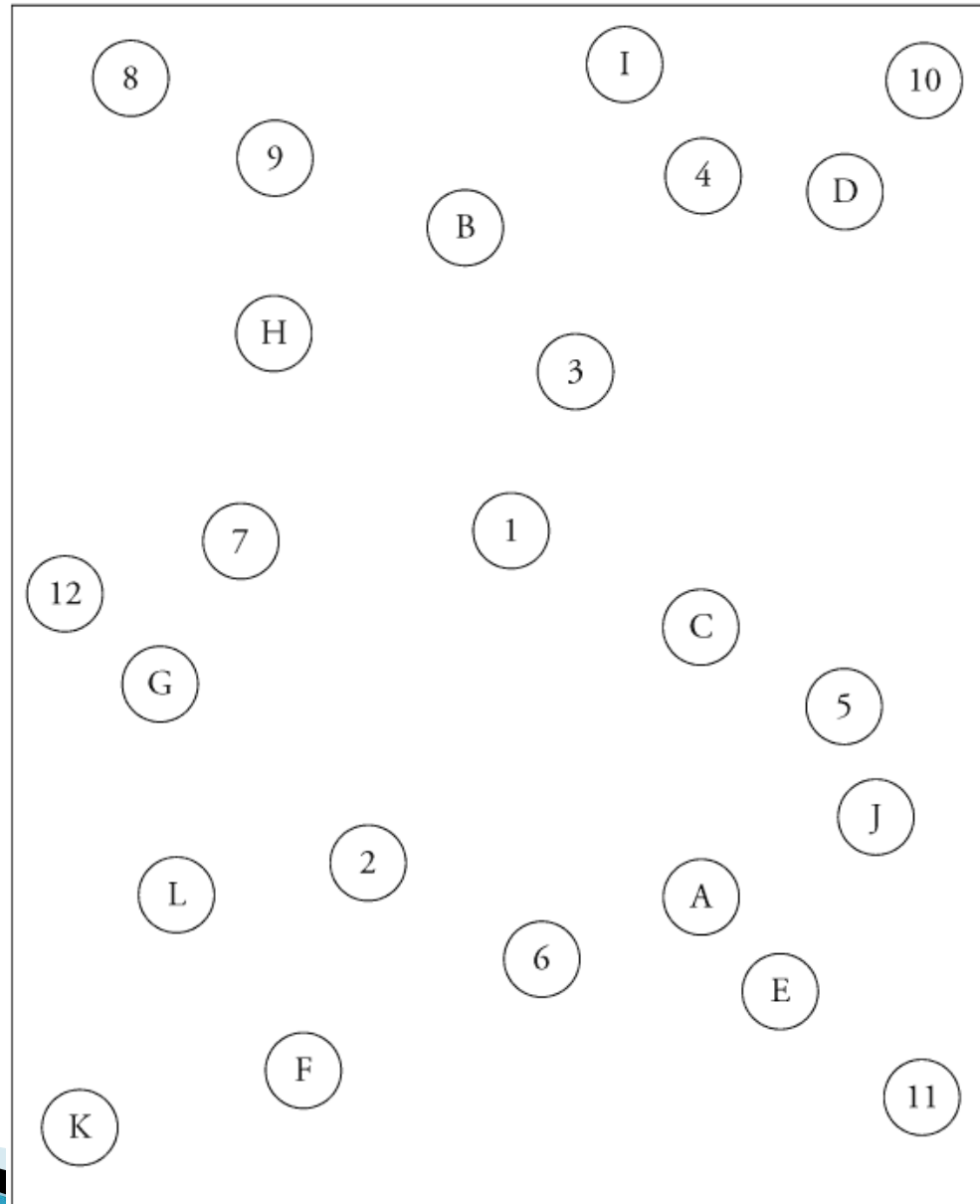Methods:

- Informed consent from participants
- Administered screening tests
- 7 months after the completion of the screening, Maryland Motor Vehicle Administration records collected for all participants.

Useful Field of View Test

Trail Making Test- B

Motor Free Visual

**Practice Item for MVPT/VC Showing Target Stimulus
and Four Response Alternatives**
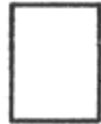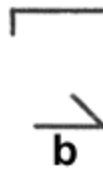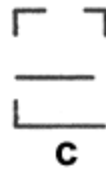
a   b   c   d

EXAMPLE

TABLE 2. Criteria Used to Determine Cut Points for High Risk Impairment Individuals
N=53 (100%)

Screening Variable	Unimpaired Test results n (%)	Impaired Test Results n (%)
UFOV	<350 40 (75)	$\geq$350 13 (25)
Trails B	Completion time <2.5 minutes 44 (83)	Completion time $\geq$2.5 minutes 9 (17)
Motor Free Visual	<5 incorrect responses 44 (83)	$\geq$5 incorrect responses 9 (17)

TABLE 3. Criteria Use to determine the three functional groups based on the Risk Impairment Algorithm N=53 (100%)

Group	N (%)	Screening algorithm results for this group
Low	31 (58)	0 screening tests above the identified impairment cut points
Middle	13 (25)	1 of the three screening test above the identified impairment cut points
High	9 (17)	2 or more screening test above the identified impaired test cut points

TABLE 4. Combination of tests above the screening cut point that determined high risk impairment. n=9 (100%)

Combination of tests above the screening cut point	High Risk n (%)
UFOV & Trails B	5 (56)
UFOV & Motor Free Visual	1 (11)
Trails B & Motor Free Visual	1 (11)
Incomplete DHI, Trails B & Motor Free Visual	1 (11)
UFOV, Trails B, Motor Free Visual	1 (11)

Table 5.Tests above the screening cut point that determined middle and high risk impairment

Test	High Risk* 9 (100%)	Middle Risk 13 (100%)
UFOV	7 (78%)	7 (54%)
Trails B	7 (78%)	1 (8%)
Motor Free Visual	4 (44%)	5 (38%)

*High risk required scoring above the cut point on at least two tests; these are not mutually exclusive categories for high risk participants.

Table 6. Risk by Demographics

Demographic	Low Risk n=31(100%)	Middle Risk n=13(100%)	High Risk n =9 (100%)	Total N=53 (100%)	Chi ^{2} (p)
Sex					
Male	15 (48)	4 (31)	5 (55)	24 (45)	1.61 (.45)
Female	16 (52)	9 (69)	4 (45)	29 (55)	
Marital Status					
Married	19 (61)	5 (38)	6 (67)	30 (57)	8.43 (.208)
Widowed	7 (23)	8 (62)	2 (22)	17 (32)	
Divorced	2 (6)	0 (0)	0 (0)	2 (4)	
Never Married	3 (10)	0 (0)	1 (11)	4 (8)	
Income*					
$0-24,999	2 (6)	1 (8)	0 (0)	3 (7)	4.17 (.654)
$25,000-49,999	12 (39)	3 (23)	5 (56)	20 (38)	
$50,000-99,999	11 (36)	7 (54)	4 (44)	22 (41)	
$100,000 & <	2 (6)	2 (15)	0 (0)	4 (8)	
Unknown	4 (13)	0 (0)	0 (0)	4 (8)	

Table 6. Risk by Demographics Continued

Demographic	Low Risk n=31(100%)	Middle Risk n=13(100%)	High Risk n =9 (100%)	Total N=53 (%)	Chi^2 (p)
Education					
High School Grad	3 (10)	1 (8)	0 (0)	4 (8)	9.20 (.33)
Partial College	4 (13)	4 (31)	4 (44)	12 (23)	
Bachelors Degree	15 (48)	4 (31)	3 (33)	22 (42)	
Masters Degree	7 (23)	2 (15)	0 (0)	9 (17)	
Graduate/Prof Degree	2 (6)	2 (15)	2 (22)	6 (11)	
Transports Others					
Everyday	1 (3)	0 (0)	0 (0)	1 (2)	7.75 (.46)
More than 1x a week	13 (42)	6 (46)	3 (33)	22 (41)	
Once a week	7 (23)	0 (0)	2 (22)	9 (17)	
A few times a month	8 (26)	4 (31)	3 (33)	16 (30)	
Rarely or Never	2 (6)	3 (23)	1 (11)	6 (11)	
Other Individuals Drive Their Car					
Yes	14 (45)	5 (38)	3 (33)	22 (42)	.468 (.79)
No	17 (55)	8 (62)	6 (66)		

MVA Results

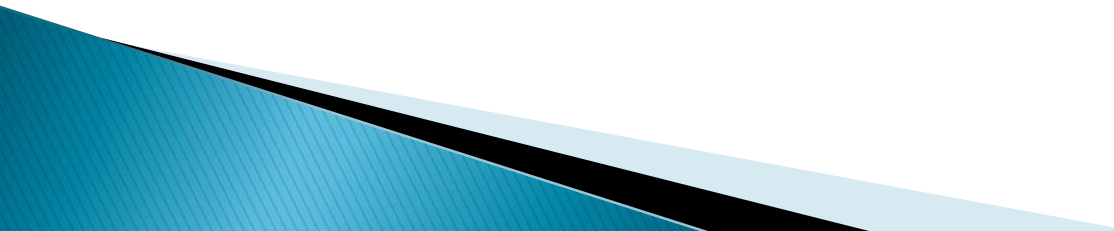**TABLE 7.** Maryland Motor Vehicle Administration Data by Risk Level

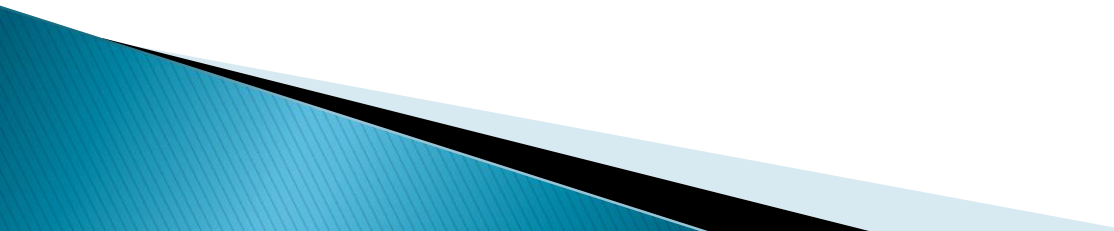|	Low Risk n=31(100%)	Medium Risk n=13(100%)	High Risk n =9 (100%)
Surrendered Driver License	2	0	1**
Citations	2	0	0
Crashes	0	3*	1*

*All except one of the crashes were determined to be the fault of the driver participant in this study. That one individual was categorized as medium risk impaired.

**This was not the same high risk impairment participant who was involved in the crash.
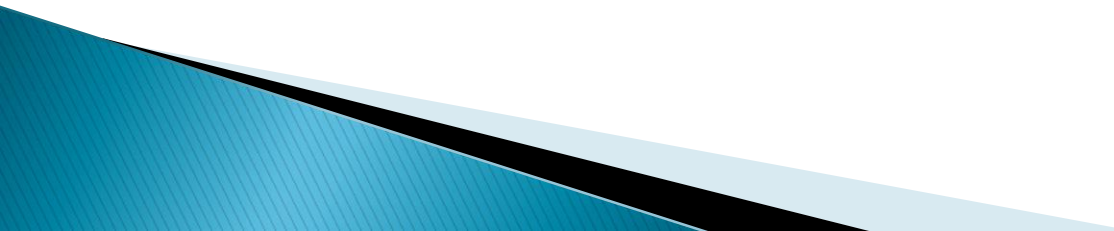
Interviews with High Risk Impairment

- Structured in-depth interviews conducted to determine participant perception of being told they were high risk
- 1-hour interviews conducted with 4 participants in their homes
- Interviews audio-taped, transcribed and coded using Excel.

Measures

- Do you remember any specific tests that you particularly (dis)liked? What made them (un)pleasant for you?
- How did you feel when you were informed of how you did on the screening tests?
- What are your thoughts about sharing your screening results with others?
- What, if any, driving changes have you made since your screening with us?

Qualitative Results Themes and Subthemes

1. Risk impairment screening experience
   a. comfort level with the test and/or testing personnel
   b. accuracy of the risk impairment test.
 2. Actions based on risk impairment screening results
   a. discussing results and
   b. changes in driving

Risk impairment screening experience

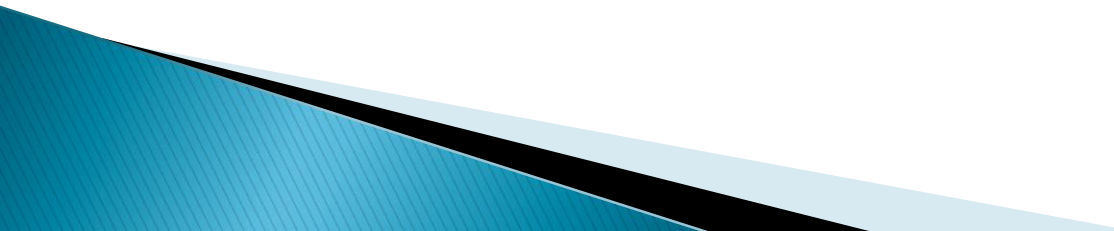Comfort level with the test and/or testing personnel

Three of the four participants described specific tests that were uncomfortable or of concern. One participant stated:

"At that time, I had a problem with my peripheral vision, in that at that time I could not turn my head. I could not turn my head, and I cannot recall why I-- actually there was a reason why I couldn't. I had-- there was something that I had done. I had a crick in my neck or something at that time. Maybe in sleeping in bed, but I couldn't get my head all the way around. And I recall that."

Risk impairment screening experience

Only one participant stated the staff made them uncomfortable, "I had the feeling that somebody [on the staff] had made up his mind to fail me. In other words, it was predestined."

Risk impairment screening experience

Each of the participants indicated that hearing the results of their performance was unsettling for them.

After hearing the results, one participant noted:

"Trying to search for a proper word. Disappointed, I guess. Disappointed and I couldn't understand why I failed because everybody tells me I'm a good driver."

Another participant mentioned, "Well, I wasn't exactly proud of myself, you can say that".

Risk impairment screening experience

Not all of the testing experiences with personnel were unpleasant; in fact some participants enjoyed particular tests and another mentioned a positive experience with the testing personnel.

"Yeah, I thought the memory things and spelling things backwards was interesting-- it was a challenge."

"I thought the lady who was doing the screening really gave me a good background about what was going to happen. So I would have no question at all about the manner in which it was presented."

Risk impairment screening experience

Most of the participants questioned the accuracy of the test. As represented by the following comment by a participant:

"[The results] worried me, but I didn't let them know. I didn't communicate that. Worried is maybe not the proper word for it. There was a gap between the test and the reality."

Actions based on risk impairment screening results

When asked with whom they shared their results, one participant stated:

"Well, I did with all my children. And oh, a couple of my friends. But we didn't go into great detail."

Actions based on risk impairment screening results

None of the participants went to their physician to tell them about their test results. One participant did visit a provider and shared the their experience.
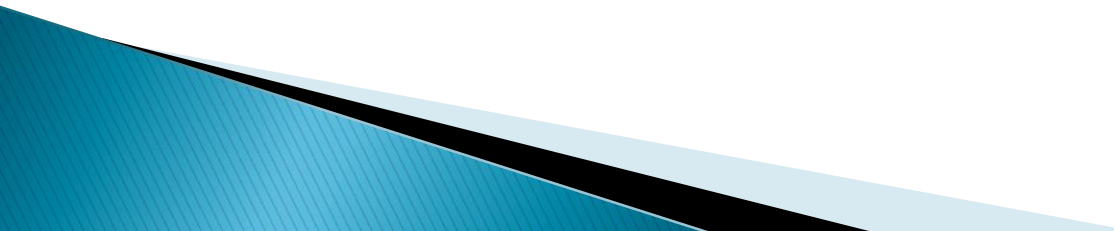
"I went to my internist, he has been my doctor for I guess 30 years, and he knows me and I feel like I know him, and he treats me like I'm his father. I...asked him about whether he thought I was qualified to drive...I didn't tell him why... And he then put me through some tests-- and it wasn't a list of words; it may have been a half a dozen words...then he proceeded onto something else, and then came back and asked me if I could state several of these words, and I could. He said, 'You are physically able. I cannot say that you are able to drive, that you should be driving. That's up to the Department of Motor Vehicles. I don't know whether you're aware of the laws or that you know when you can make a left turn or who's got the right of way. The laws, that's up to them.' So that was it. And so I continued to drive."

Actions based on risk impairment screening results

1 participant mentioned that the risk impairment screener had an impact on driving behavior. That one participant surrendered driving privileges completely. This participant mentioned that several factors were related to relinquishing driving privileges; however the risk impairment screener was the catalyst for the final decision.

Of the screening assessment that participant said:

"I think probably subconsciously it was the reason I gave up my car, because I realized that my reflexes were not as good as they were. And it just seemed to me like I should quit while I'm ahead, which is kind of a strange way to put it but I really do feel that... unless it's vital that we have our car and use our car, we seniors, to drive. And I think if you're involved in-- if I were driving and was involved in an accident, I would feel that because I am the age I am that perhaps I didn't see the accident the way the officer or whoever was reviewing the accident. And I just personally felt that I don't really have to drive."

Discussion

- More than one-half of the sample was classified as low risk impairment.

- If a screening assessment only relied on one test such as the results of the UFOV, up to half of those with elevated risk impairment could be missed.

- While there were no crashes during this study, four participants (medium and high risk impaired) were at-fault in a MVC prior to entering the study.

Discussion

- Technology and the population being assessed
- Perceptions of the staff
- Implication of the results

Dr. Vanya Jones, PhD, MPH
vjones@jhu.edu
410–502–9932