Workshop: Avaliação das habilidades necessárias para direção Veicular em populações com necessidades especiais

Workshop: Assessment of skills needed for vehicular direction in populations with special need

Local: Fundação Carlos Alberto Vanzolini
Avenida Paulista, 967, São Paulo - SP, 01311-100
3º andar

Objetivo geral / General objetive

Avançar o conhecimento científico atual sobre aspectos relacionadas à condução de veiculos automotores: modalidades de avaliação e os resultados das avaliações para idosos e pessoas com deficiência com e sem doenças crônicas e incentivar colaborações futuras pesquisas.

Advance the current scientific knowledge on aspects related to the driving of motor vehicles: methods of assessing the results of evaluations and the results of the evaluations for elderly and disabled people with and without chronic diseases and encourage future research.

Objetivos específicos / Specific objectives

Fornecer uma visão geral do estado da arte da avaliação do condutor: modalidades de avaliação, modelos, ferramentas utilizadas para avaliar a função motora, visão, cognição e comportamento relacionado à condução de veículos automotores.

1. Identificar sistemas de avaliação das habilidades de condução de veículo automotor em um ambiente fechado (clínica e pesquisa) com o uso de simulador de direção e no ambiente real;
2. Verificar como o processo de envelhecimento, doenças crônicas e deficiências físicas podem afetar a as habilidades de condução de veículo automotor.
3. Apresentar os resultados do estudo USP-FAPESP - Avaliação comparativa do desempenho dos motoristas idosos versus motoristas adultos.
4. Verificar implicações: política e prática

Provide an overview of the state of the art of evaluation: methods of evaluation, models, and tools used to evaluate motor function, vision, cognition and behavior related to the driving of motor vehicles.

1. **Identify evaluation systems of the driving skills of motor vehicle in a closed environment (clinical and research) with the use of driving simulator and the real environment;**
2. **Check how the process of aging, chronic illnesses and disabilities can affect the driving skills of motor vehicle.**
3. **Present the results of the study USP-FAPESP-comparative evaluation of performance of elderly drivers versus adult drivers.**
4. **Check implications: policy and practice**

Audiência/ Audience – 40 técnicos convidados pela FMUSP, DETRAN e Secretaria de Estado dos Direitos das Pessoas com Deficiência (SEDPD).

40 technicians invited by FMUSP, DETRAN and the State Secretary of the Rights of Persons with Disabilities (SEDPD)

Programa/ Program

DIA 1	
08h00 – 08h30	Inscrições Registration
09h00-09h30	Relevância do Tema e Oportunidades de Colaboracoes **Theme relevance and Collaboration Opportunities**
Linamara Rizzo Batisttella, MD, Ph.D, Full Professor of PM&R of Medical School of University of São Paulo. Secretary of the Rights of people With Disability of the State of São Paulo. **Denise G Tate**, Ph.D., Professor and Associate Chair for Research, Director of the University of Michigan Spinal Cord Injury Model System, Department of Physical Medicine and Rehabilitation **Julia Maria D'Andréa Greve**, MD, Ph.D, Associated Professor of Medical School of University of São Paulo **Rosana Soares Néspoli,** Mestre em Tecnologia da Informação e da Comunicação, Pedagoga - Especialista em Educação, Gerente da Escola Pública de Trânsito do DETRAN-SP.	
09:30-10:00	Avaliação comparativa do desempenho dos motoristas idosos versus motoristas adultos. **Comparative Evaluation of the performance of elderly drivers and adult driver**
Angelica Castilho Alonso, PT, MS, Ph. D. , Researcher of Laboratório de Estudos do Movimento FMUSP	
10h00 10h15	**Coffee Break**
10h15 – 10h45	**Componentes do modelo de avaliação de condução para idosos** Evaluation of the Driving Skills of Aging Adults
Jean T Shope, MSPH, Ph.D. , Research Professor, University of Michigan Transportation Research Institute and School of Public Health	
10h45 11:15	**Avaliacao de direcao para deficientes fisicos: Perspectiva dos EUA** Perspective Evaluation of the Driving Skills of Persons with Disabilities: USA
Paula Kartje OTR/L, DRS, Manager, Physical and Occupational Therapy, Driver Rehabilitation Specialist, Med Rehab Outpatient Services, Department of Physical Medicine and Rehabilitation	
11h15-11h30	Avaliação visual: componentes e importância **Visual Evaluation: relevance and components**
☐ Angelica Castilho Alonso, PT, MS, Ph. D. , Researcher of Laboratório de Estudos do Movimento FMUSP	
11h30-12h:00	**Discussão e Perguntas**

	Questions and Answers
12h00 13h30	**Almoço** **Lunch**
13h30 14h00	**Fatores neuromotores na direção veicular: doenças crônicas, deficiências e envelhecimento** Neuromotor Factors to consider When Evaluating and Treating Driving Impairments
Chandramouli Krishnan PT, Ph.D., Assistant Professor, Department of Physical Medicine and Rehabilitation, Department of Biomedical Engineering and School of Kinesiology; Director, Neuro Lab, University of Michigan	
14h30 – 15h00	Disfunção Muscular no envelhecimento e obesidade – implicações na habilidade de direção veicular Dysfunctional Muscle in Aging and Obesity: implications for Driving Performance
Mark D Peterson Ph.D. Research Assistant Professor, Department of Physical Medicine and Rehabilitation.	
14h30 15h30	**Fatores cognitivos e comportamentais envolvidos na direção veicular** Cognitive and Behavioral Assessments in Driving Evaluation Research
Bruno J Giordani Ph.D. , Professor, Department of Psychiatry, Neurology and Psychology; Chief Psychologist, Department of Psychiatry, Associate Director, Michigan Alzheimer Disease Center **Denise G Tate**, Ph.D., Professor and Associate Chair for Research, Director of the University of Michigan Spinal Cord Injury Model System, Department of Physical Medicine and Rehabilitation	
15h30 16h00	**Coffee Break**
16h00 17h00	**Uso de simuladores na avaliação e treinamento** **The Use of Simulators in Driving Evaluations and Training**
Jean T Shope (UM); Carlos Cavenagh and Sileno Santos, PT, MS - FMUSP.	

DIA 2	
09h00- 10h30	**Apresentação de Casos de Avaliação** **Case Reports: Elderly adult, SCI and Amputee**
Paula Kartje (UM); Sileno Santos and Angelica Castilho Alonso (FMUSP)	
10h30-11h00	**Coffee Break**
11h00 12h00	"Processo para obtenção de CNH destinado à pessoa com deficiência" **"Driving license obtaining process for disability person"**
Rosana Soares Néspoli (DETRAN) - Mestre em Tecnologia da Informação e da Comunicação, Pedagoga - Especialista em Educação, Gerente da Escola Pública de Trânsito do DETRAN-SP.	
12h00 13h30	**Almoço**
13h30 14h30	Painel de Discussão – sobre as apresentações **Panel of Discussants Reaction to Presentation** **UM and FMUSP Team** **Questions and Answers**
15h00 15h30	**Coffee Break**
15h30 17h00	Oportunidades para Colaborações em pesquisa: próximos passos **Opportunities for Research Collaborations: Next Steps?** Julia Greve e Denise Tate

ABSTRACTS FOR USP –UM SYMPOSIUM- April 2014

"Dysfunctional muscle in aging and obesity: Implications for driving performance." – Mark Peterson
Abstract:
The overall purpose of this talk will be to provide an overview of how excess adipose tissue and chronic sedentary behavior contribute to muscle atrophy, fragility, and gross motor dysfunction with aging. New evidence will be presented which implicates a mechanism linking excess ectopic adipose tissue deposition and muscle and bone density loss, as well as the reciprocal relationship between muscle weakness and chronic disease risk. Finally, discussion will highlight the importance of these factors for neuromuscular performance during driving, as well as the role of physical activity to preserve health and functional independence.

"**Cognitive and Behavioral Assessments in Driving Research**" – Bruno Giordani and Denise Tate
Abstract:
This presentation will describe the need for cognitive testing when assessing driving skills. It will discuss some of the most common modalities for testing cognition in relation to driving as well as ways in which behavior can influence driving abilities. Models for neuropsychological and behavioral testing will be reviewed including cognitive testing for healthy elderly individuals and those with comorbidities including dementia, Parkinson's disease and traumatic brain injury. Specialized approaches for cognitive and behavioral testing for adults with either motor and/or cognitive impairments will be discussed in greater detail including those with physical disabilities such as spinal cord injury. Finally, the presentation will focus on behavioral, demographic and cross-cultural issues to consider when conducting these assessments.

"**Evaluation of the Driving Skills of Aging Adults**" – Jean Shope
Because of an increase in crashes among the oldest drivers, efforts have been undertaken 1) to identify essential competencies for driving, 2) to assess older drivers on those competencies, and 3) to study the ability of those assessments to predict drivers who may be at high risk. A model used in a University of Michigan study of older drivers will be presented, and its results discussed in the context of other approaches recently reported.

"**The Use of Simulators in Driving Evaluations and Training**" – Jean Shope
The potential of driving simulators for assessing and training older drivers has not been fully explored or utilized. The University of Michigan Transportation Research Institute driving simulator will be described, and outcomes that can be measured using it will be shared. The possibility of future research collaboration opportunities will be highlighted.

"**Neuromotor Factors to Consider when Evaluating and Treating Driving Impairments**" – Chandramouli Krishnan
Abstract:
This presentation will provide a brief overview of various neuromuscular factors that can affect driving performance and may contribute to driving impairments. Neuromuscular factors will be reviewed based on existing evidence and theoretical framework. The presentation will also provide a brief overview on the methods to evaluate these parameters. The presentation will conclude by discussing select novel approaches that capitalizes on neuromuscular plasticity to treat driving impairments in elderly individuals and in various disease conditions.

"**Evaluation of the Driving Skills of Persons with Disabilities: The US Perspective**"- Paula Kartje
Abstract:
A comprehensive driving evaluation, including both a clinical assessment and on road evaluation, is essential in determining whether a person with a disability can continue or return to driving. This presentation will describe the process and assessment model that is commonly used in the US by driver rehabilitation specialists. Considerations for people with different disabilities including amputations, multiple sclerosis, Parkinson's disease and spinal cord injuries will be reviewed. Lastly, options to

facilitate independent driving including adaptive equipment and compensatory techniques will be described.

"Avaliação comparativa do desempenho dos motoristas idosos versus adultos em um teste realizado em simulador de direção veicular" - Angelica Castilho

O impacto do envelhecimento biológico sobre as habilidades de conduzir um veículo automotor estão relacionadas com os aspectos motores, sensoriais e cognitivos. O **objetivo** do estudo foi comparar o desempenho na condução veicular de motoristas idosos *versus* adultos e relacionar parâmetros motores de força muscular e cognitivos com o desempenho funcional durante direção veicular em simulador de direção. **Métodos:** Foram avaliados 164 voluntários de ambos os gêneros s e divididos em dois grupos: a) Grupos Idosos com média de idade de 70,4(5,8) anos e b) Grupo Adultos com média de idade de 39,8(7,2) anos. Os voluntários foram avaliados por questionários sobre dados pessoais e demográficos, Mini Estado de Saúde Mental (MESM), a avaliação de força muscular do tornozelo foi realizada no dinamômetro isocinético na velocidade de 30°/s e da preensão palmar pelo dinamômetro manual. O equilíbrio dinâmico foi avaliado pelo teste Time up Go (TUGT) com e sem tarefa cognitiva. A medida do tempo de reação para frenagem e velocidade foi realizado no simulador de direção veicular. **Resultados:** Os idosos apresentaram maior tempo de reação e menor velocidade que os motoristas adultos avaliados no simulador de direção veicular. Em relação ao tempo de reação (frenagem) houve correlação negativa com as variáveis de força e cognição e positiva com a idade e equilíbrio postural (com e sem dupla tarefa). Em relação à velocidade houve correlação negativa com a idade e equilíbrio postural e positiva com as variáveis de força e cognição. A analise de regressão demonstrou que em relação ao *tempo de reação: a* idade explicou 13% do tempo de reação e o TUG, pico de torque ajustado pelo peso corpóreo (PT/BW) e força de preensão palmar do lado dominante explicou 22%. A cognição (MESM) explicou 13% e a atividade com dupla tarefa explicou 19%. Com relação à velocidade média: idade (13%); TUGT e a força de preensão palmar do lado dominante (9%), cognição (MMEM) (5%) e TUGT com dupla tarefa (7%). **Conclusões**: Os idosos demoram mais tempo para frear o veículo e compensam esta dificuldade pela redução da velocidade. O maior tempo de frenagem está relacionado com a diminuição da força muscular dos flexores plantares do tornozelo e preensão palmar e com condições piores de saúde mental.

"Comparative Evaluation of the performance of elderly and adult drivers using a car-simulator test driving"- Angelica Castilho

The impact of biological aging on the ability to drive a motor vehicle is related to the loss of some motor, sensory and cognitive aspects. The aim of this study was to compare the performance of elderly versus adult drivers in a car-simulator driving with the ankle and hand-grip muscle strengthen and with cognitive status. Methods: 164 volunteers of both genders are divided into two groups: seniors groups: mean age of 70.4 (5.8 years) and adults group: mean age of 39.8 (7.2 years). the volunteers were assessed by questionnaires for personal and demographic data, mini mental state examination(MMSE), ankle muscle strength muscle performed on the isokinetic dynamometer at 30°/ and handgrip muscle strength performed in a manual dynamometer. Dynamic balance was assessed by time up go test (TUGT) with and without dual cognitive task. The reaction time (breaking time) and speed is measured during the car-simulator driving. Results: senior groups had greater reaction time and smaller speed than adults group. Reaction time had a negative correlation with the muscle strength variables and cognition and had a positive correlation with age and TUGT (with and without dual task). Speed had negative correlation with age and positive with TUGT, muscle strength and cognition variables. a series of stepwise regressions demonstrate that the main factors related to reaction time (breaking time) were: age (13%); TUGT, flexor plantar and dominant handgrip muscle strength (22%); cognition (MMSE) (13%) and TUGT dual task activity (19 %). the main factors related to average speed were: age (13%); TUGT and dominant handgrip muscle strength (9%); cognition (MMSE) (5%) and TUGT dual task (7%).

conclusion: the elderly take longer time to stop the vehicle and in order to compensate this difficulty reduces the speed. the longer breaking time is associated with decreasing ankle plantar flexion and dominant handgrip muscle strength and with worse mental health conditions.

"Uso de simuladores na avaliação e treinamento para pessoas com deficiência" "- Sileno Santos

Resumo: Serão abordados os aspectos práticos da utilização do simulador de percurso para a avaliação da habilidade de dirigir em pessoas com deficiência e as principais adaptações necessárias para o uso do simulador para este público. Conceitualmente os aspectos da dirigibilidade com relação ao conforto, segurança, facilidade e nível de dificuldade serão abordados visando a quebra de paradigmas da avaliação da habilidade de dirigir para pessoas com deficiência.

"The use of virtual driving simulator for training and the driving ability assessment for people with disabilities" – Sileno Santos

Abstract. In Brazil, the use of virtual driving simulator is an obligation by law for new driver's license while the assessment of driving ability has been in focus for research at University of Sao Paulo Medical School. During this lecture, practical aspects of using the simulator route for the assessment of driving ability in people with disabilities and the main adaptations required to use the simulator will be presented. Conceptual aspects of driving ability with respect to comfort, safety, ease and difficulty level will be discussed aiming to break paradigms assessing the skill of driving for people with disabilities.