

Master class *Driving with low vision*

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Wim van Damme is a medical physicist with a scientific background in human vision research. His early scientific work at Utrecht University was on perception of three-dimensional information from optic flow and later at Rotterdam Erasmus University on the role of binocular vision in eye-hand coordination. Operating in low vision rehabilitation for 20 years now, he currently is chairman of the Visio national working group on automobility which develops rehabilitation programs for driving and keeps strong connections with the Dutch ministry of transport about adapting driving legislation. His activities at Visio also include research on eye-tracking in low vision assessment and developing specific automated perimetry tests for visually impaired people.

Master class abstract

Driving a car has become important for nearly everyone on the planet. Societies without cars are nearly unthinkable. But for visually impaired people, driving is not always that apparent. Driving a car with reduced visual acuity or visual field defects requires compensatory abilities or technical aids.

This masterclass will outline the legal aspects of driving in the European Union. Of various modalities of motorized transport the characteristics will be discussed that are important for visually impaired people. Dutch rehabilitation options will be outlined that compensate for

reduced visual acuity (bioptic telescope) or reduced visual field (compensatory scanning training). The masterclass will focus on passenger cars, but also include agricultural vehicles and microcars (max. 45 km/h). Sometimes, alternative methods of (motorized) transport might be a better solution to mobility problems than driving a car.

When visual functions are impaired, more emphasis will be on behavioural aspects of driving. Michon (1985) described the active road user as a problem solver using strategic, operational and tactical behaviour. The masterclass will show that his theory is at the base of rehabilitation methods in motorized traffic where time limited decision making is crucial for safe traffic.

Based on the positive results in the Netherlands, bioptic driving is now allowed in the European Union since Jan 1th 2017. All EU-member states are free to offer driving related rehabilitation services to visually impaired people. However, setting up such services is not without risks. The masterclass will deal with most common pitfalls and caveats. It describes ways to set up a proper rehabilitation program including visual assessment, mobility training and driving lessons. Building a knowledge network and a professional training program, preferably with certification of professionals is of utter importance for a sustainable rehabilitation service.

This masterclass will give you the tools to initiate a rehabilitation program for driving with low vision in your own country or EU member state. The acquired technical, legal and practical knowledge, together with several case reports, will help you to deal with challenges in the process of embedding the program in your country.

Reference:

John A. Michon: *A critical view of driver behavior models: What do we know, what should we do?* Human Behavior and Traffic Safety (1985) pp 485-524.

Speakers (15 min each):

- Prof. Aart Kooijman, PhD
- Bart Melis-Dankers, PhD
- Gera de Haan, PhD
- Wim van Damme, PhD
- NN, Mobilitytrainer

Subjects in this masterclass

General items

- The UN Convention on Rights of Persons with Disabilities (CRPD)
- the Individual right to travel wherever, whenever and how you want
- Designing the environment to meet the demands of the VIP
- Using assistive technology (bioptic telescope, mobility cars, electronic navigation apps, three-wheeled and hybrid bikes etcetera) in traffic
- Training of visual functions, optimizing sensory functions in traffic
- Follow a person's life cycle from childhood to adulthood and high age

Michon's Model in general

- hierarchical structure of problem solving tasks in traffic and transportation
- the active road user as problem solver
- environment, strategical, tactical and operational behavior
- reaction on environmental challenges, automated actions

Michon's Model for VIP's

- operational level (unable to react properly and in time on environment because of visual impairment)
- Driving behaviour and driving skills can compensate for impaired medical fitness to drive
- Examples of strategical behavioral compensation for VIP's: audible navigation devices, smart trip planning (weather, time, route), choice of transportation mode, minimized technical distraction or simply clean the windshield
- Examples of tactical behavioral compensation

Motorized vehicles

- Types: cars, agricultural vehicles, microcars
- Vehicle specifications in relation to visual functions and driving
- Legislation Dutch, European

Compensatory options

- Biotopic telescope (including demonstration)
- Gaze training (including demonstration)
- Other options such as prisms

Cars and Agricultural vehicles

- Age: 16+ (EU)
- Rehabilitation options
- Assessment
- Referral
- Training
- Driving lessons
- Fit-to-drive test