

# ABI/TBI-Induced Vision Impairment Adressed in a Multidisciplinary Rehabilitation Setting



*Steen Aalberg, F.C.O.V.D.I., optometrist  
DENMARK*

*Practices in private VT-only office in the most  
southern part of Denmark close to the German border.*

# A pilot study

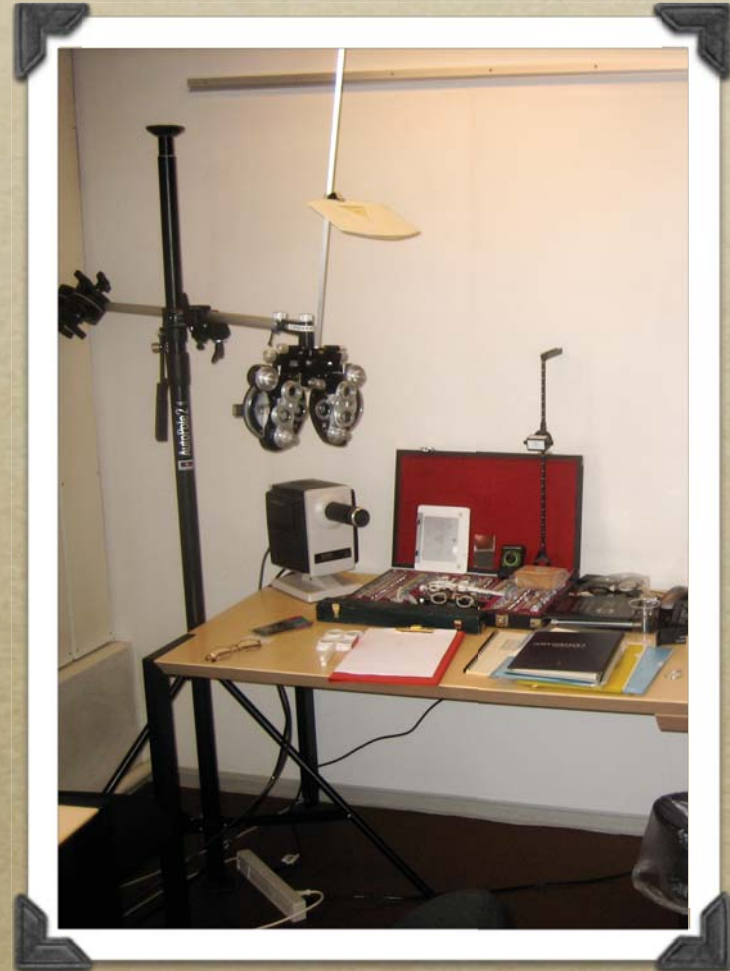
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## *Purpose:*

- *To identify the prevalence of untreated visual problems in the ABI/TBI group*
- *To highlight the value of adding optometry and optometric vision training to the existing rehabilitation programs*

## Problems:

- Right now very few visual problems are addressed in current rehab programs in Europe.
- Even though visual problems can form massive obstacles for other types of rehabilitation, optometric intervention is rare.



# Interdisciplinary contact

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- *After stating to a group of decision makers on the field of brain damage, that vision is the director of movement, and every movement in it's precision, efficiency and elegance depends fully on the quality and richness of the vision guiding it, a meeting was set up.*
- *Realizing, (After a few hours of more detailed explanation of vision from an optometric viewpoint), the importance of the above statement for other rehab work, the group decided to set up this pilot study at Center for rehabilitation of brain injury in Copenhagen to clarify the prevalence of visual problems, and how they are addressed.*

# Plan and design

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- *The initial plan was, among patients entering a program at the facility, to identify the ones presenting with visual problems.*
- *Once identified, to form two groups of patients for a brief VT-program, offset in time thus serving as control groups for each other*

# Plan and design

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- *Lacking resources we were forced to reduce the model and go for one group, and do the VT part after the scheduled rehab in order to separate effects.*
- *Patients were to be examined three times:  
Before entering rehab at the center, after their four months program and then again after six sessions of VT*

# Patients

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- *Nine patients were offered an exam and participation if problems were found that were regarded amenable to VT.*
- *Three declined for personal reasons, mostly because the VT part and further exams would follow after their rehab program and they did not feel up to it.*

# Patients

- *Of the remaining six subjects, one was rejected after the initial exam, although having potential benefit, he lacked motivation and had acquiesced in his visual situation with hemianopia and simpler refraction issues. He was given a new prescription for near and far.*





# Patients

- *The remaining five subjects agreed to the exams and to participate in six VT-sessions within six weeks in June and July 2009.*
- *The program was on informed consent basis without ethical issues. Patients were between 35 and 55 years of age.*
- *We tried to get as much information on the brain damage as possible, but only got one scan and some written descriptions from patient files.*

# Results of examination

(only the 5 subjects went through 2. exam)

- *Visual field defects and/or neglect, 5/5*
- *Diplopia, 2/5*
- *Eye motor problems, 5/5*
- *Fixation problems, 5/5*
- *Binocular problems, 5/5*
- *Acc. insufficiency and/or presbyopia, 5/5*
- *Cvg. insufficiency, 4/5*
- *Suppression, 4/5*
- *Decreased stereo acuity, 5/5*
- *Refraction issues, 5/5*

# Results of examination

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- *The listing is incomplete, but illustrates the massive unmet need for optometric intervention. Only visual field defects and neglect was mentioned in the patient files in spite of comprehensive examinations from medicine and neuropsychology.*

# Results of examination

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- *At the second exam after the patients finished their general rehab program, there were no significant changes in the repeated measures.*
- *Compensatory strategies (closing an eye, head turns, withdrawal) were more prevalent, and suppression tendencies had increased, indicating maladaptation.*

# Optometric Visual Therapy

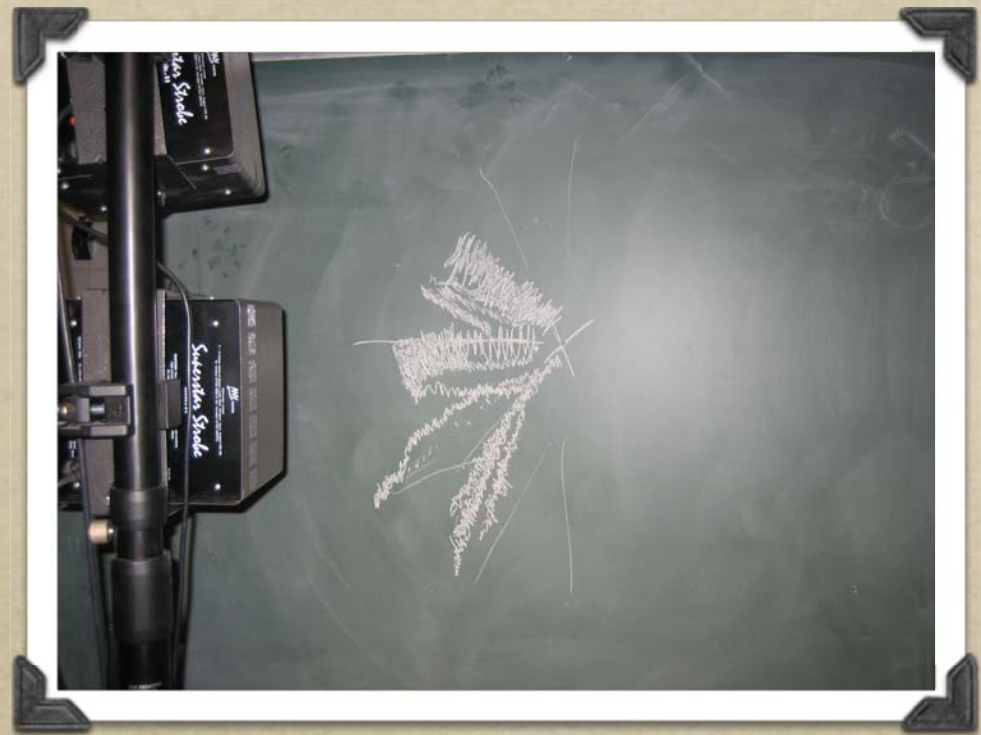
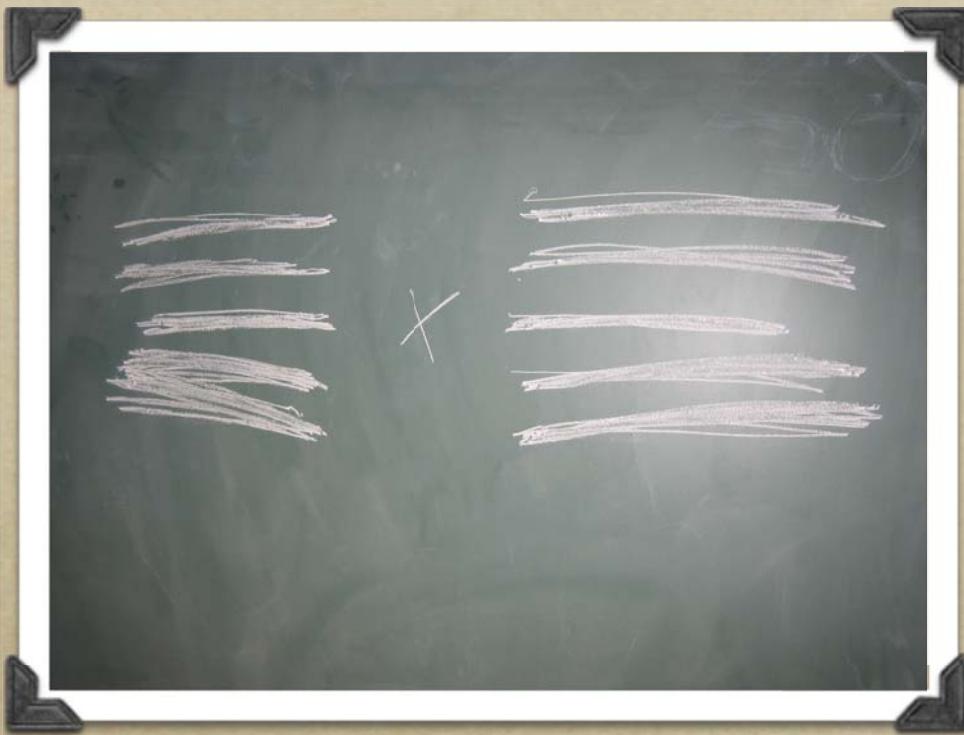
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- *Available was six time slots of 3 hours at the rehab center spread over a six week period. The three hours included all necessary breaks.*
- *Training was done in a group setting, partly one on one and partly self training following individual instructions. When possible two optometrists were present.*

# Optometric Visual Therapy

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- *All procedures were individually loaded and instructed.*
- *Procedures fell in the following categories: Eye control, balance, fixation, tracing, timing, eye-hand coordination, antisuppression, binocularity, chalk board work (fields, timing and motor symmetry).*



- *Top left is a drawing three months after a “Clean V1” left hemianopsia. Patient was instructed to fixate the “x” and draw straight lines of equal length by the feel of it.*
- *Top right is a training set up for the same kind of situation.*

## *Other samples:*

- *Balance and eye control was trained on a balance board with a wide base initially, decreasing the base width with progress.*
- *Rotator tasks were used for fixation, pursuits, eye-hand coordination, fine spatial control and balance*
- *Inch cubes build - draw - rebuild for visual memory, visual spatial relationship, visualization, visual manipulation in internal space world*



# Experiences

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- *Disregarding field problems for a moment, the most affected areas (really surprising the therapists and patients) were binocularity, timing, balance and speed.*
- *Once we began working on these, the problems were popping into consciousness of the patients and their watching therapists, making the optometric needs very obvious.*

# Experiences, snakes sneaking in and out...

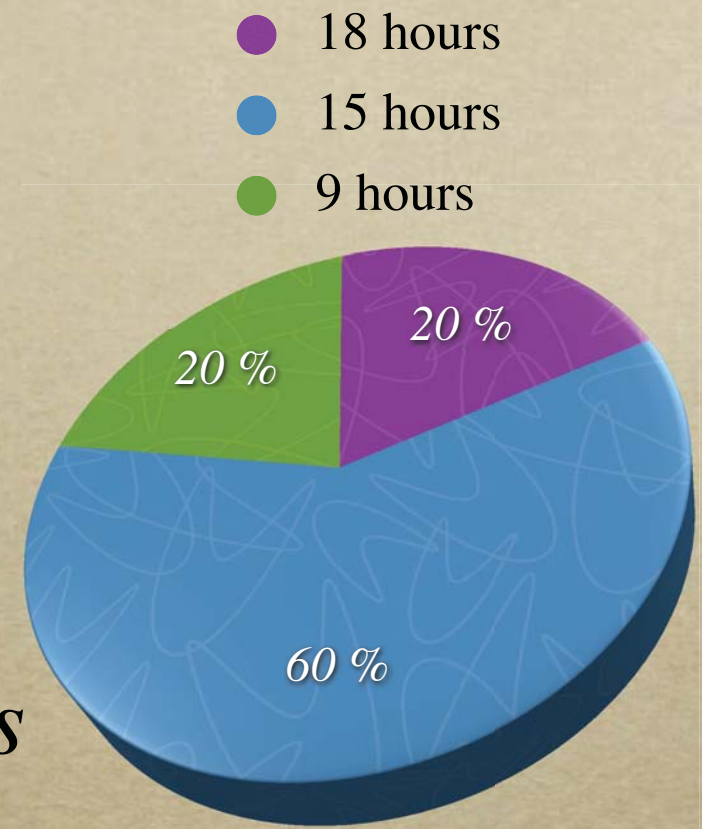
- *Scores on the QOL-questionnaire got worse, as subjects got better and discovered their own level of performance, making statistic evaluation very difficult.*
- *Just being conscious of your problems can make you feel worse! This transition phase may reoccur at different levels.*
- *This has already led to efforts originating from COVD (initiated by Dr. W.C. Maples at sco) on creating a QOL-questionnaire designed for mild ABI/TBI patients, in order to overcome or bypass these problems and develop a new tool for evaluation of progress in this group.*

# Experiences, snakes sneaking in and out...

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- *With such a small group, limited resources and a short time frame, a project is prone to suffer from external influence.*
- *Due to different personal issues, not all subjects were able to participate for all offered sessions, and the need for breaks varied greatly.*

- *Only one (20%) was present during all sessions.*
- *Three missed out one full day or three hours in total*
- *One missed two days and always needed to leave early, missing 9 hours*
- *Two were able to participate at the last exam, the rest were evaluated based on notes from training sessions*



# Outcome

- *The rehab center realized the benefits right away and expressed their wish to offer optometric intervention on a permanent basis.*
- *The patients all expressed the program as a positive experience and hoped for this kind of treatment to be permanent and initiated up front in a rehab program*
- *My personal interest is to be able to work with these patients not having to actually fight for it*

# Outcome

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- *Right now we have a grant application pending that, IF, we get the funds we can do a 2-3 year trial on 50-100 patients, with optometric exams and training being an integrated part of the rehab.*