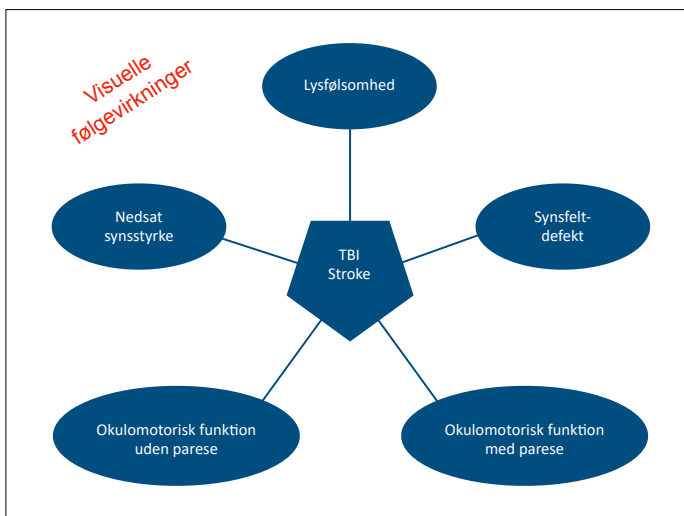
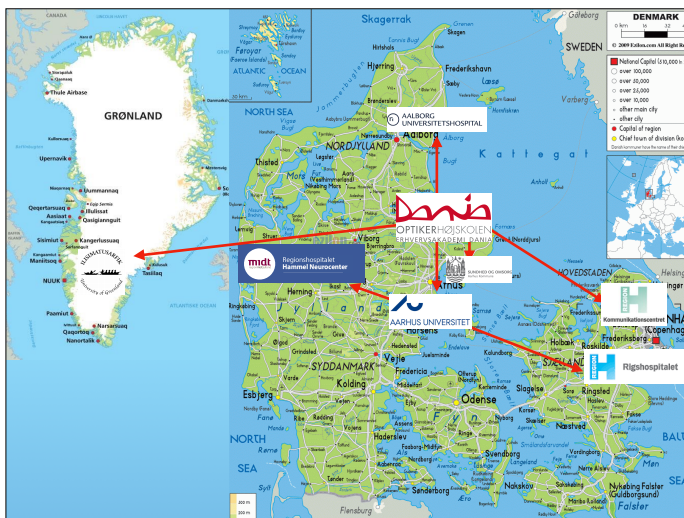


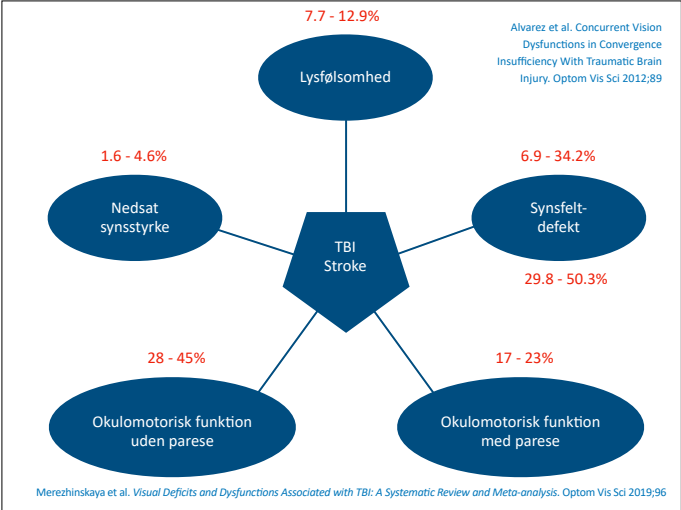
Nordisk Konference SYN & HJERNE 2025

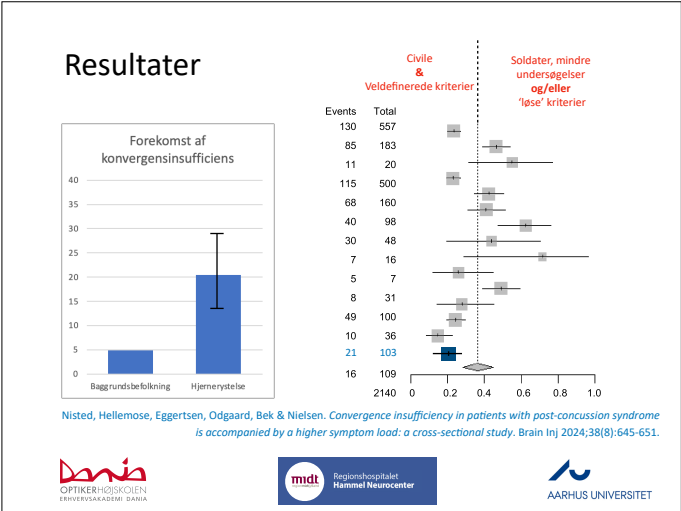
Evidensen for synsrehabilitering af patienter med erhvervet hjerneskade

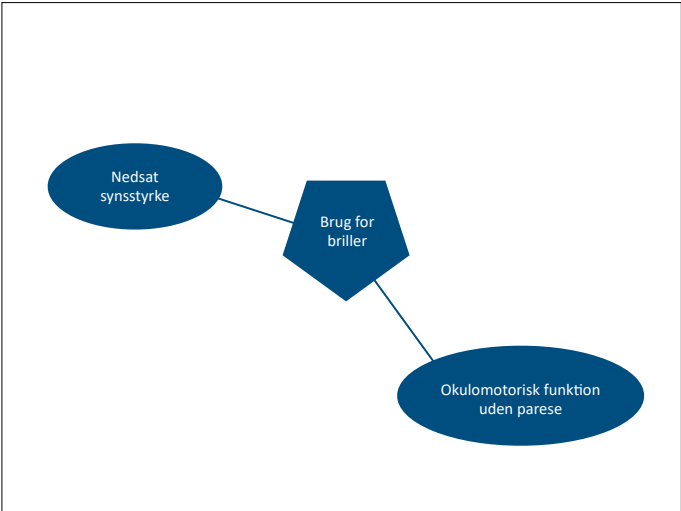


25. marts 2025
Ivan Nisted









Nedsat
synsstyrke

Har danskerne de briller, de har brug for?

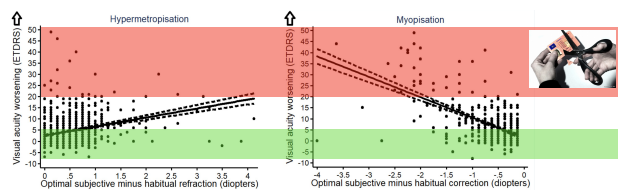


Fig. 1. The reduction in distance visual acuity as a function of optimal subjective subtracted by habitual refraction in the eye where this difference was largest positive.

Fig. 2. The reduction in distance visual acuity as a function of optimal subjective subtracted by habitual refraction in the eye where this difference was largest negative.

Bek, Hammer Bech & Nisted. Use of refractive aids among adults in a general population. Sci Rep. 2025 Jan 2;15(1):151

Få borgerens syn undersøgt!

BEHANDLING

Alm. brillebehov

Prismeglas

Filterglas

Blikstabilisering

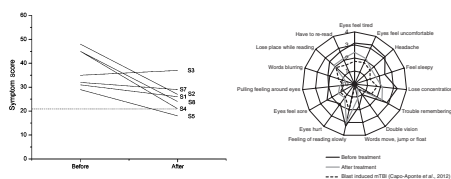
Samsynstræning

BEHANDLING

Alm. brillebehov

mTBI med samsynsanomali (n=8)
(Før-efter design)

Tildeling af læsebriller

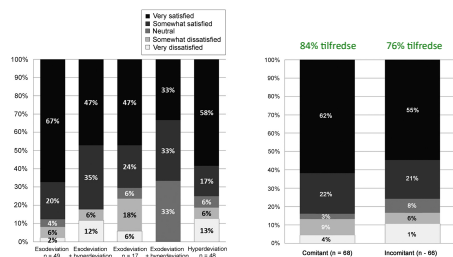


Johansson et al. The effect of spectacle treatment in patients with mild traumatic brain injury: a pilot study. Clin Exp Optom 2017; 100: 234–242

BEHANDLING

Prismeglas

Prismekorrektion hos patienter med skelen & dobbeltsyn (n=128)
(Prospektiv interventionsstudie)



Tamhakar et al. Benefits and side effects of prisms in the management of diplopia in adults: a prospective study. J AAPOS 2021;25:85.e1-6

BEHANDLING

Bedring i kontrastsensitivitet og læsehastighed med filterglas

???

Binocular log contrast sensitivity data in normal observers and patients with TBI

	Effects of CPF lenses			
	No Filter	(+) 450	(+) 527-S	(+) 550-S
Normals (n = 7)				
Mean (S.D.)	1.95 (0.12)	1.97 (0.10)	1.88 (0.08)	1.84 (0.16)
Patients (n = 7)				
J.U.	1.95	2.10	2.25	2.10
L.S.	1.95	2.25	2.25	2.10
B.B.	1.35	1.65	1.65	1.45*
D.B.	1.95	2.10	1.95	1.95
R.S.	1.95	2.25	1.95	1.95
M.J.C.	1.95	1.95	1.80	1.65
A.P.B.	1.95	2.25	2.10	1.95
Mean (S.D.)	1.86 (0.23)	2.08 (0.22)	1.99 (0.23)	1.88 (0.24)



Jackowski et al. Photophobia in patients with traumatic brain injury: Use of light-filtering lenses to enhance contrast sensitivity and reading rate. NeuroRehabilitation.1996: 193-201

Bedring i komfort !

Filterglas nedsætter dog spontan remission (n=62)

Truong JQ, Cluffreda KJ, Han MH, Suchoff IB. Photosensitivity in mild traumatic brain injury (mTBI): a retrospective analysis. Brain Inj. 2014;28:1283e7

BEHANDLING

“Fra laboratoriestudier”

Samsynstræning af konvergensinsufficiens
MR-scanning før, umiddelbart efter og 1 år efter træning.

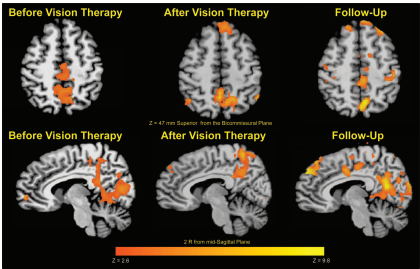


FIGURE 7. Axial and sagittal view of data from functional imaging experiment studying prediction for four C3 subjects. Images on the left column are the average of the before vision therapy data set, the middle column are after vision therapy, and the right column are from a follow-up scan. On average, increases in spatial extent (amount of significant activation) and/or intensity are observed when comparing the before and after scans.

Alvarez et al. Vision Therapy in Adults with Convergence Insufficiency: Clinical and Functional Magnetic Resonance Imaging Measures. Optom Vis Sci 2010;87:E985–E1002

BEHANDLING

“Uden kontrolgruppe”
Stroke-pt med synsfeltdefekt (n=24)

Therapist-assisted vision therapy improves outcome for stroke patients with homonymous hemianopia alone or combined with oculomotor dysfunction
Peter Smaakjær, Signe Tornøe Tødtén and Rune Skovgaard Rasmussen

Table 1. The main results from before and after the intervention and their associated p-values.

Test	N	Baseline	After intervention	p-Value
Griffinian	24	7.5 (0–16.5)	14 (0.5–20)	0.002
Reading test	18	88 (62–112)	104 (78–130)	0.0004
Star test, seconds to carry out	20	101 (69–130.5)	118 (88–156)	0.24
Star test, number correctly counted	20	12.5 (9.5–15)	15.5 (14–17)	0.002
COPM completion	22	9 (7–13)	15.5 (13.5–20)	0.0001
COPM satisfaction	22	6.5 (4–10)	15.5 (11–18)	0.0001

Results are presented as median values with the associated 25th and 75th percentiles in brackets.

12 uger med samsynstræning

Bedring af

- Læsehastighed (ord pr minut)
- Visuel opmærksomhed i det perifere synsfelt

Smaakjær et al. Therapist-assisted vision therapy improves outcome for stroke patients with homonymous hemianopia alone or combined with oculomotor dysfunction

BEHANDLING

“Uden kontrolgruppe”
mTBI - største studie til dato

Vision Therapy for Post-Concussion
Vision Disorders

Michael Galloway^a, Mitchell Scheiman^a, and G. Lynn Mitchell^b

TABLE 5. Changes in clinical measures after VT for subjects who completed VT

Diagnosis	Test	Mean pre-VT	Mean post-VT (SD)	Mean change	p-value
CI (n = 43)	CISS	31.1	11.0	−21.1 (±8.8)	<0.0001
	NPC break (cm)	13.0	3.3	−9.7 (±10.1)	<0.0001
	NPC recovery (cm)	17.7	5.6	−12.0 (±8.5)	<0.0001
	BO break (pd)	18.1	38.9	20.8 (±8.6)	<0.0001
	BO recovery (pd)	11.2	32.1	20.9 (±7.0)	<0.0001
AI (n = 39)	CISS	28.6	8.6	−20.0 (±9.8)	<0.0001
	Accommodative amplitude (cm)	14.1	9.5	−4.6 (±3.6)	<0.0001
SD (n = 23)	DEM horizontal speed (sec)	49.9	33.8	−16.1 (±14.3)	<0.0001
	DEM errors	1.82	0.59	−1.24 (3.6)	0.45

Galloway et al. Vision Therapy for Post-Concussion Vision Disorders. Optom Vis Sci 2017;94:68-73

1. Alene, livstilsnærvær
 2. Præstegård
 3. Fjellengård
 4. Biskopsbøllevær
 5. Samsynstræning

mTBI - største studie til dato

Michael Gallaway*, Mitchell Scheiman†, and G. Lynn Mitchell‡

Retrospektivt studie - Gennemsnitlig behandlingstid 14.5 uger

175 deltagere med mTBI & samsynsanomali

- 52 fravælger VT
- 28 fuldfører ikke VT
- 95 fuldfører VT

Succesrate for patienter pt, der **fuldfører** samsynstræning

- konvergensinsufficiens 85%
- for akkommodationsinsufficiens 33%
- sakkadisk dysfunktion 83%

Gallaway et al. Vision Therapy for Post-Concussion Vision Disorders. *Optom Vis Sci* 2017;94:68-73

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Alus, brillebærbæ
Fremmedgæst
Filtregas
Bilskatbælværing

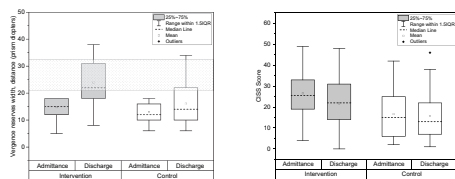
Samsynstræning

Moderat til svær TBI

8 uger med øvelser, 3-4 dage/uge i klinik
Intervention (n=43), kontrolgruppe (n=33)

Bedring af

- Samsyn (NPC, vergensfaciliteit, fusionsvergens)
- Visuele symptomen (CISS)



Johansson et al (2021) Vision therapy as part of neurorehabilitation after acquired brain injury: a clinical study in an outpatient setting. *Brain Injury*, 35:1, 82-89

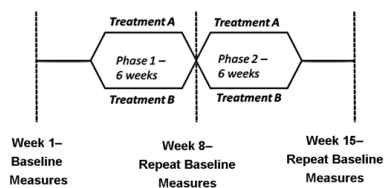
12 p
• 6 u
2 x

Alm. Indlæselser
Prædikener
Fattigvesen
Biskopsdømmet
Samsynstræning

RCT-studie med overkrydsning

12 patienter med mTBI og okulomotorisk dysfunktion

- 6 ugers samsynstræning & 6 ugers placebotræning
2 x 45 min pr uge (i klinik)



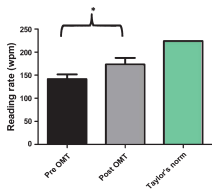
BEHANDLING

RCT-studie med overkrydsning

12 patienter med mTBI og okulomotorisk dysfunktion

Resultater

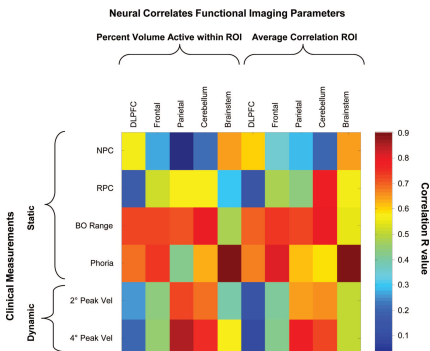
Signifikant forbedring af læseparametre, tilnærmer sig normal funktion



Visagraph parameter	normal at baseline		Significant	p value
	Baseline	Post-OMT		
Reading rate (wpm)	142 (10)	177 (14)	yes	<0.01
Comprehension (%)	81 (4)*	85 (3)	no	0.31
Fixations/100 words	164 (10)	135 (11)	yes	0.02
Regressions/100 words	30 (3)	23 (4)	no	0.11
Fixation duration (sec)	0.27 (0.008)*	0.27 (0.10)	no	0.91
Grade level efficiency	4.1 (0.7)	6.3 (1.2)	yes	0.01

Thiagarajan P et al. Oculomotor neurorehabilitation for reading in mild traumatic brain injury (mTBI): An integrative approach. NeuroRehabilitation 34 (2014) 129–146

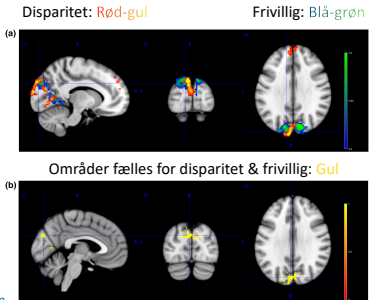
Øjentræning/blikstabilisering vs. samsynstræning



Alvarez et al. Vision Therapy in Adults with Convergence Insufficiency: Clinical and Functional Magnetic Resonance Imaging Measures. Optom Vis Sci 2010;87:E985–E1002

4 typer konvergens, 4 lokaliseringer

1. Psykisk bevidsthed
2. Akkommodation
3. Disparitet
4. Frivillig



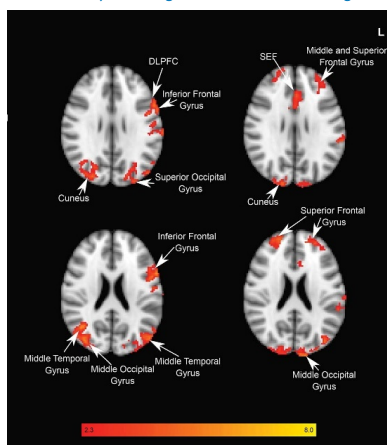
Fogt et al. Functional magnetic resonance imaging activation for different vergence eye movement subtypes. Ophthalmic Physiol Opt. 2023;43:93–104.

Samsynstræning

Placebo-træning

A significant decrease in activation was also observed in areas of the brain devoted to **attention** after vergence-accommodative therapy and to a lesser extent after placebo therapy.

Widmer, Kulp et al. Post-therapy Functional Magnetic Resonance Imaging in Adults with Symptomatic Convergence Insufficiency. *Optom Vis Sci* 2018;95:505-514.



Positiv effekt

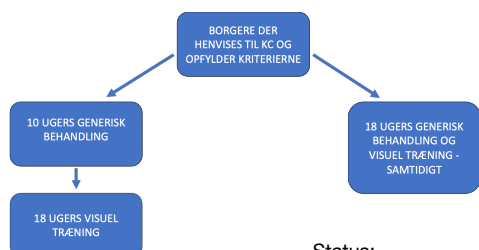
Svag evidens

Stærk evidens

Samsynstræning

Negativ effekt

Igangværende RCT-studier i Danmark



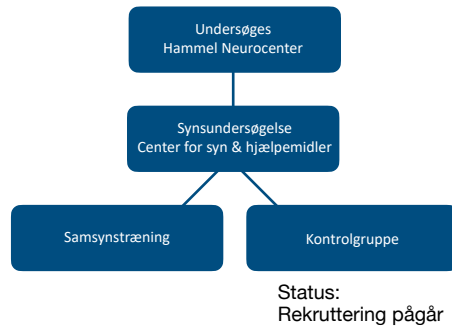
Status:
Rekruttering i sidste fase

Danish
OPTIKERHØJSKOLEN
DRIVVERDALSGADE 1, 2200 COPENHAGEN



REGION H Kommunikations-centret

Igangværende RCT-studier i Danmark



Dania
OPTIKERHØJSKOLEN
ERHVERVSKOLEN I DANMARK

mdt Regionshospitalet
Hammel Neurocenter

AARHUS UNIVERSITET

Håndtering af patienter med erhvervet hjerneskade

