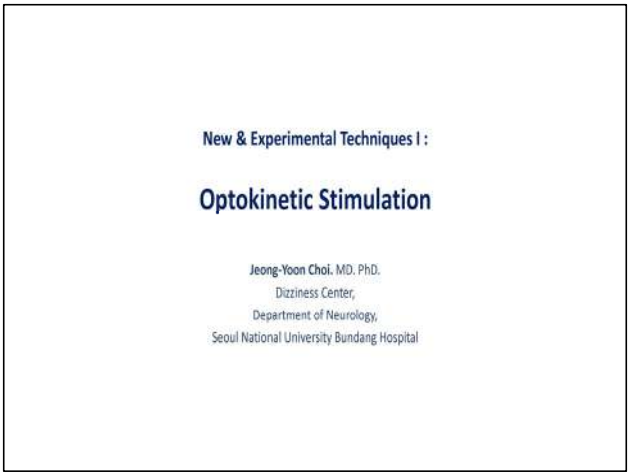
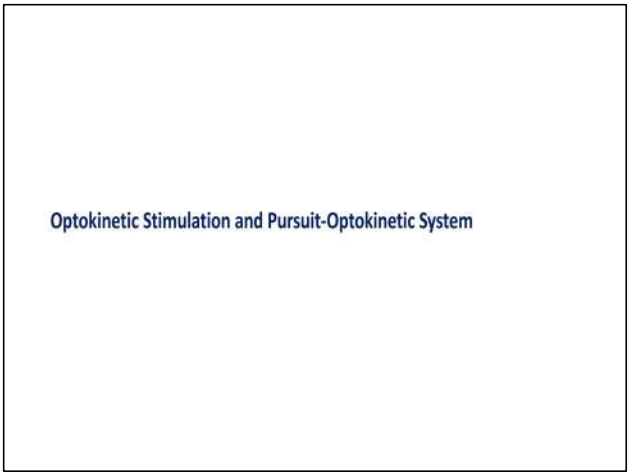
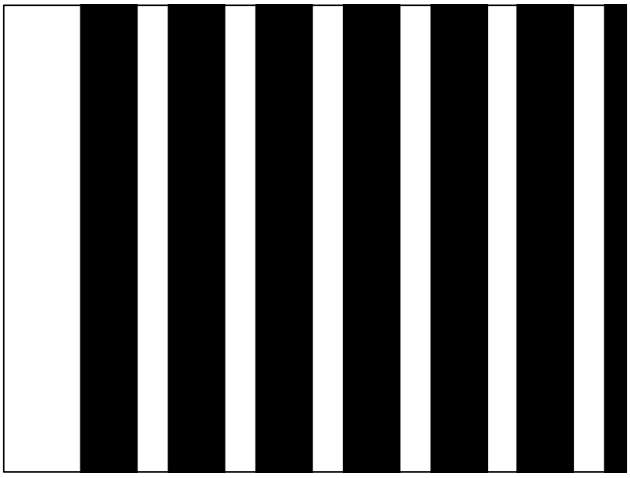
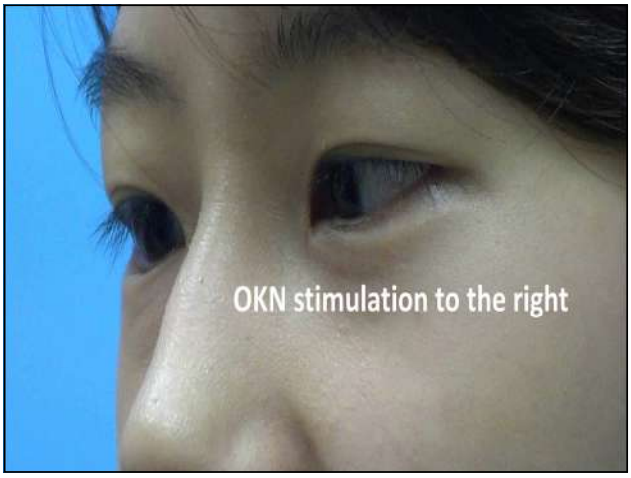
New and experimental techniques I : optokinetic stimulation

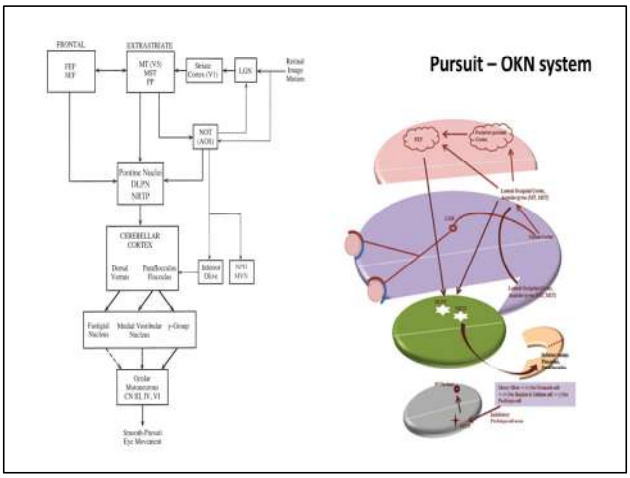
최 정 윤
분당서울대병원

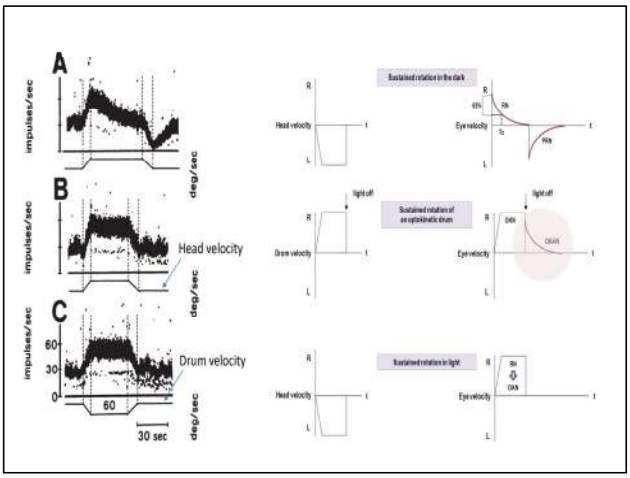


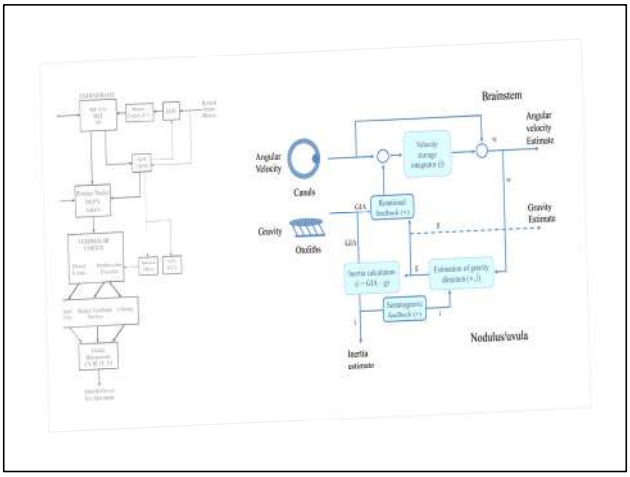






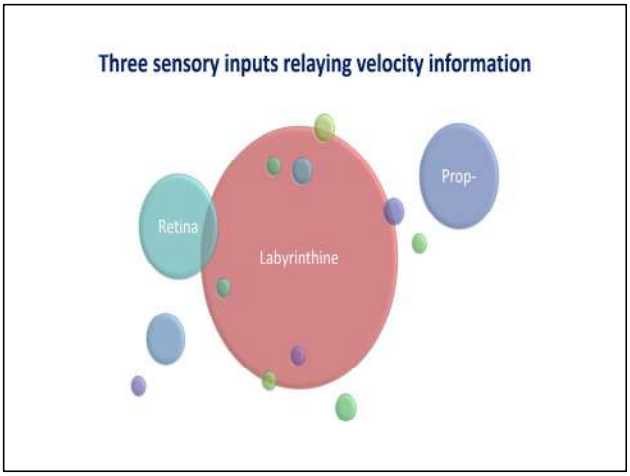




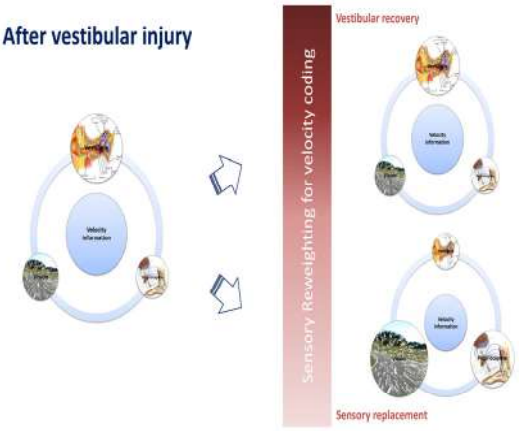


Optokinetic Stimulation: Pursuit, Optokinetic, Velocity-Storage system

Optokinetic stimulation in vestibular rehabilitation



After vestibular injury



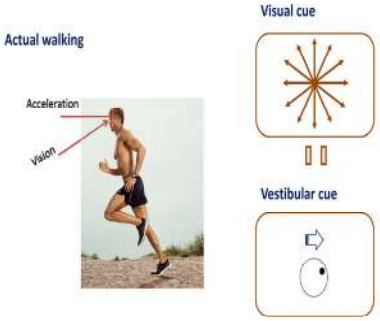
Visual vertigo in some patients with vestibular injury

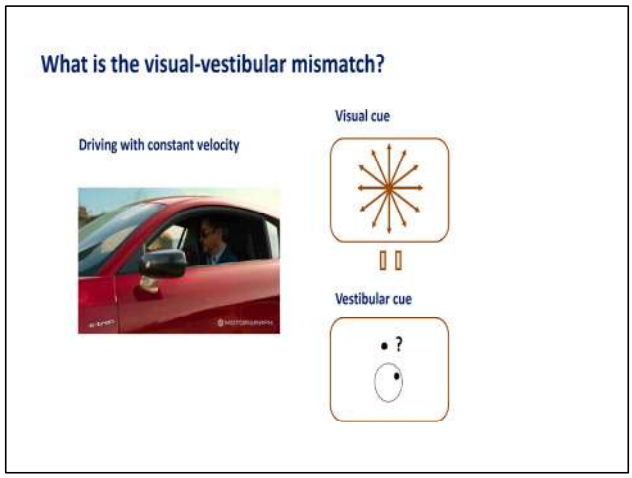
- Individuals with vestibular disorders experience **discomfort, postural instability, and symptoms of dizziness, light headedness, and/or disorientation** in situations involving **visual-vestibular conflict** or **intense visual motion stimulation**.
- Space and motion discomfort, Visual vestibular mismatch, Motorists' disorientation syndrome.

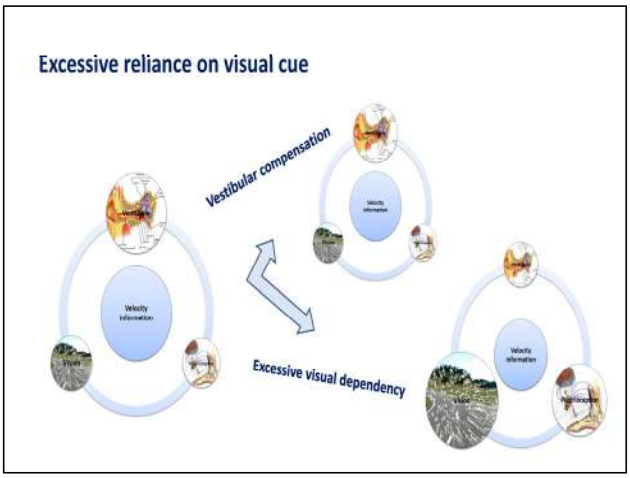
Excessive reliance on visual cue

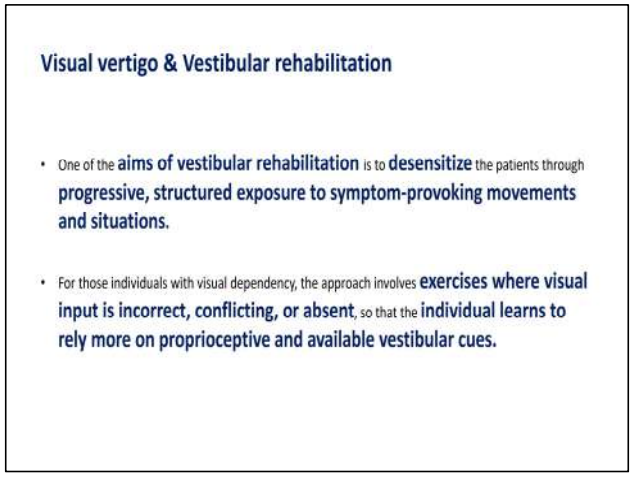
- One of the **factors** underlying **poor vestibular compensation**, especially in **situations causing visual-vestibular conflict**.
- A **mismatch** between **visual** and **vestibular input** regarding movement and orientation.

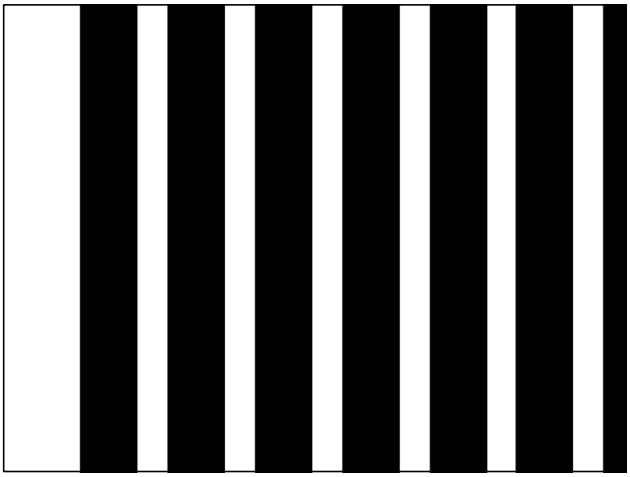
What is the visual-vestibular mismatch?

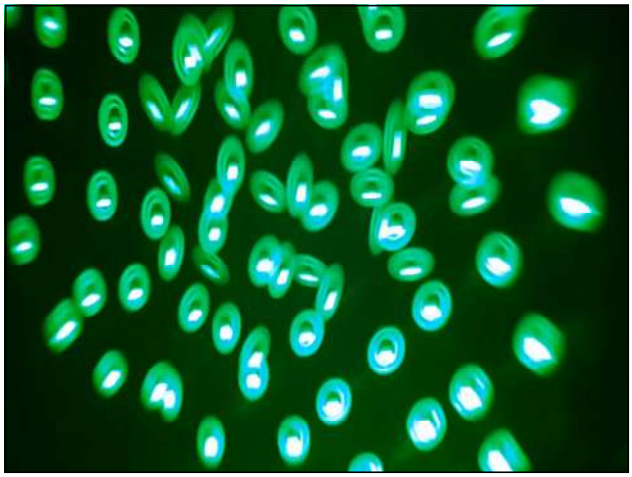


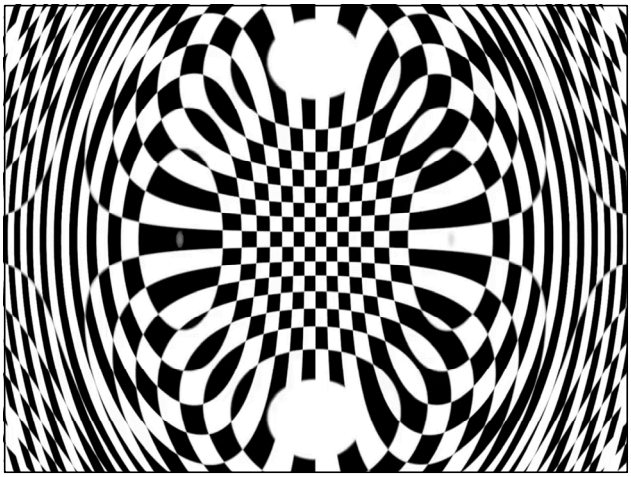

What is the visual-vestibular mismatch?
Driving with constant velocity
Visual cue
Vestibular cue
?


Excessive reliance on visual cue
Vestibular compensation
Excessive visual dependency


Visual vertigo & Vestibular rehabilitation
• One of the aims of vestibular rehabilitation is to desensitize the patients through progressive, structured exposure to symptom-provoking movements and situations.
• For those individuals with visual dependency, the approach involves exercises where visual input is incorrect, conflicting, or absent, so that the individual learns to rely more on proprioceptive and available vestibular cues.







Effect of OKN in Vestibular Rehabilitation

- Rehabilitation programs **promoting desensitization** and **increased tolerance** to visual stimuli through **exposure to visual motion (i.e., optokinetic stimulation) would be specifically beneficial** for individuals with VV.

The effect of repeated visual motion stimuli on visual dependence and postural control in normal subjects

Marousa Pavlou[a], Catherine Quinn[a], Kate Murray[b], Chrysa Spyridakou[a], Mary Faldon[a], Adolfo M. Bronstein[b,*]

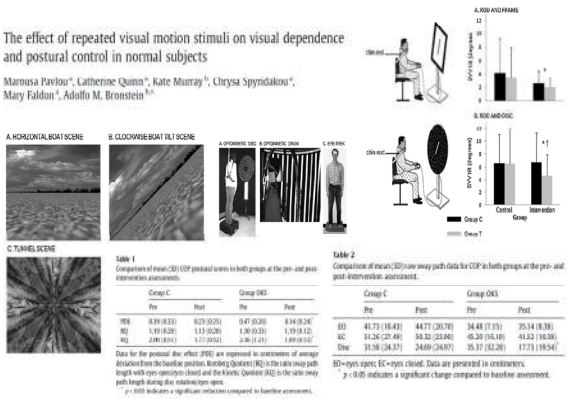


Table 1
Comparison of mean (SD) COP postural scores in both groups at the pre- and post-intervention assessments.

	Group C		Group OKS	
	Pre	Post	Pre	Post
PDE	0.39 (0.13)	0.23 (0.25)	0.47 (0.20)	0.14 (0.24)*
RQ	1.19 (0.28)	1.13 (0.28)	1.30 (0.33)	1.19 (0.12)
SQ	2.00 (0.51)	1.77 (0.51)	2.06 (1.21)	1.69 (0.51)*

Data for the postural disc effect (PDE) are expressed in centimeters of average deviation from the baseline position. Romberg Quotient (RQ) is the ratio sway path length with eyes open/eyes closed and the Kinetic Quotient (KQ) is the ratio sway path length during disc rotating/eyes open.
* $p < 0.05$ indicates a significant reduction compared to baseline assessment.

Table 2
Comparison of mean (SD) raw sway path data for COP in both groups at the pre- and post-intervention assessment.

	Group C		Group OKS	
	Pre	Post	Pre	Post
EO	41.73 (16.43)	44.77 (20.70)	34.48 (7.15)	35.14 (8.38)
EC	51.26 (27.49)	50.32 (23.04)	45.20 (16.19)	41.32 (16.38)
Disc	31.56 (24.37)	24.69 (24.87)	35.37 (32.28)	17.73 (19.54)*

EO = eyes open; EC = eyes closed. Data are presented in centimeters.
* $p < 0.05$ indicates a significant change compared to baseline assessment.

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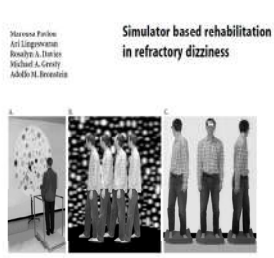
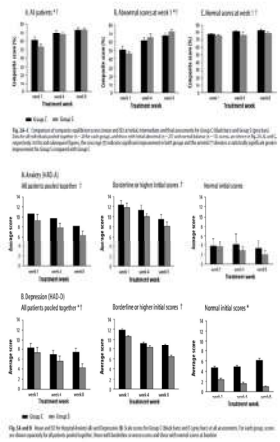
Simulator based rehabilitation in refractory dizziness





Randomized Trial of Supervised Versus Unsupervised Optokinetic Exercise in Persons With Peripheral Vestibular Disorders

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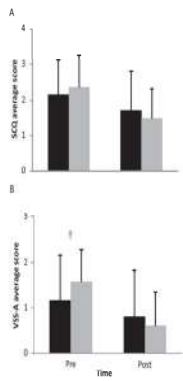

Thanks for your attention