



Functional Evaluation of
Hemianopic Visual Field Defects



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Two friends in a
hot air balloon
get blown off
course ...






Homonymous Field Defects




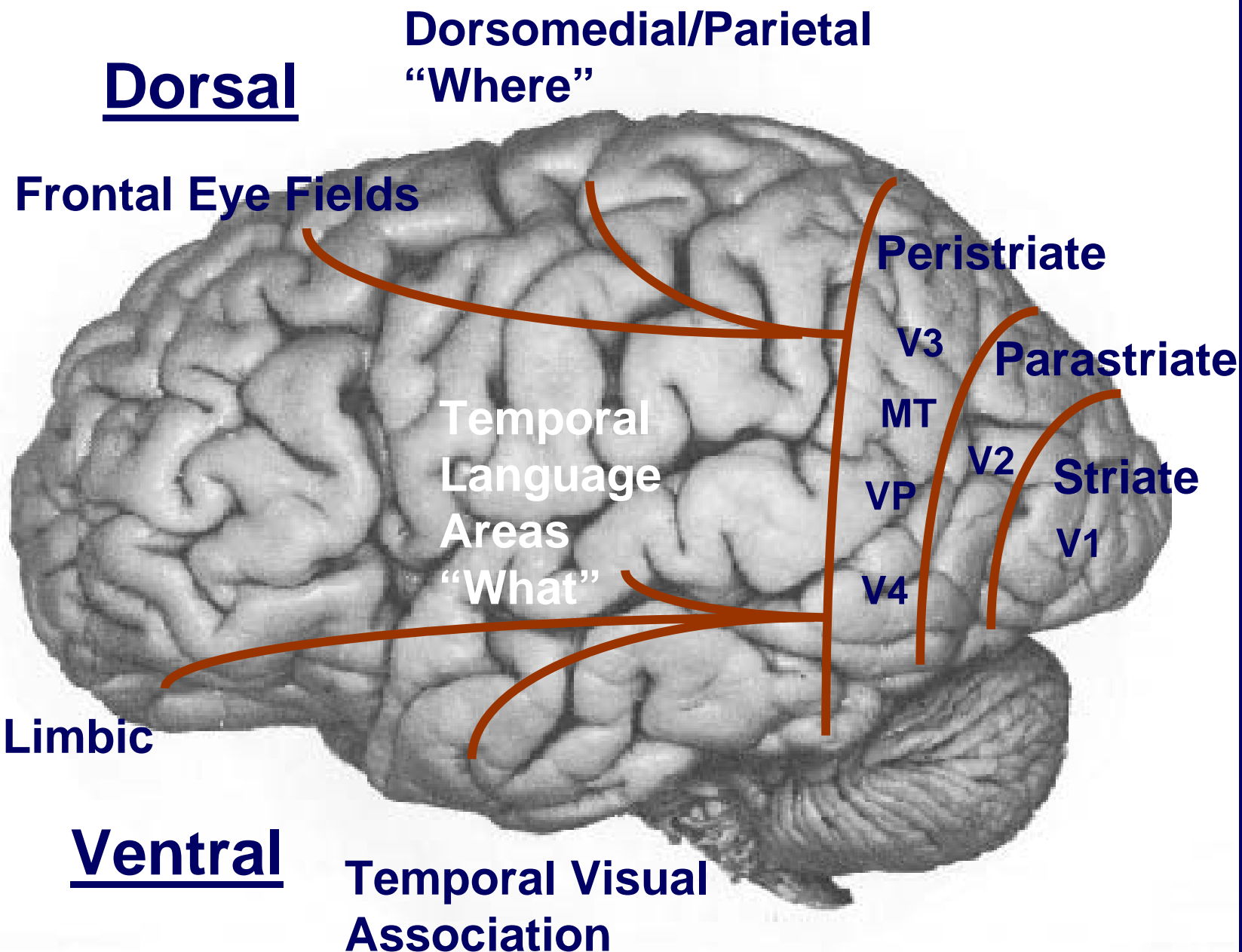
- Post-chiasmic:

- Hemianopic *vs.* Quadrant *vs.* Micro
 - Lateral: Right *vs.* Left
 - Altitudinal: Superior *vs.* Inferior
 - Macular sparing
- 



Behavioral/History Observations

- Mobility
 - Inattention, Startle, Self-care
 - Posture, balance
 - Reading
 - Associated deficits
 - Motor, Language, Emotions, Perception
- 



Dorsal

**Dorsomedial/Parietal
"Where"**

Frontal Eye Fields

Peristriate

Parastriate

**Temporal
Language
Areas
"What"**

V3

MT

VP

V4

V2

Striate

V1

Limbic

Ventral

**Temporal Visual
Association**

Cortical Visual Processing

Striate
V1

Parastriate
V2

Peristriate
MT- Movement
V4- Color

Perception

Dorsal Pathway
Parietal/Pre-motor
"Where"

Ventral Pathway
Temporoparietal/Limbic
"What"

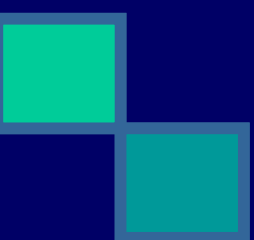

Occipitofugal
Associative Pathways
(Interpretation)

Visual Reaching
Oculomotor Scanning
Visual-Spatial Integration
Spatial Attention

Alexia
Optic Aphasia
Color Anomia
Object Agnosia



Striate-Peristriate Syndromes

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- 
- Blind Sight- accurate detection in a “blind” field
 - Anton’s Syndrome- Denial of Cortical Blindness
 - Akinetopsia- cannot perceive visual motion
 - Central Achromatopsia- cannot perceive, name or match colors



Ventral Visual Association Pathway Syndromes- *“What”* Syndromes

- Visual-verbal dissociations- *naming*
 - Color Anomia, Alexia, Object Anomia
- Visual-Visual dissociations- *organizing*
 - Prosopognosia, Associative Visual Object Agnosia
- Visual-Limbic dissociations
 - Visual Amnesia, hypoemotionality
- Temporal Lobe Visual Association Cortex
 - Visual Distractability, Integration, Hallucinations

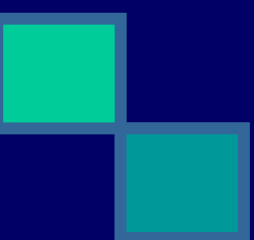



Dorsal Visual Association Pathway Syndromes- *“Where”* Syndromes

- Balint’s Syndrome- requires all 3 components
 - Simultanagnosia- disruption of spatial scanning
 - Oculomotor apraxia- erratic scanning and fixational spasms
 - Optic ataxia- misreach toward visual stimuli
- Hemispatial Neglect
 - Loss of spatially addressed attention

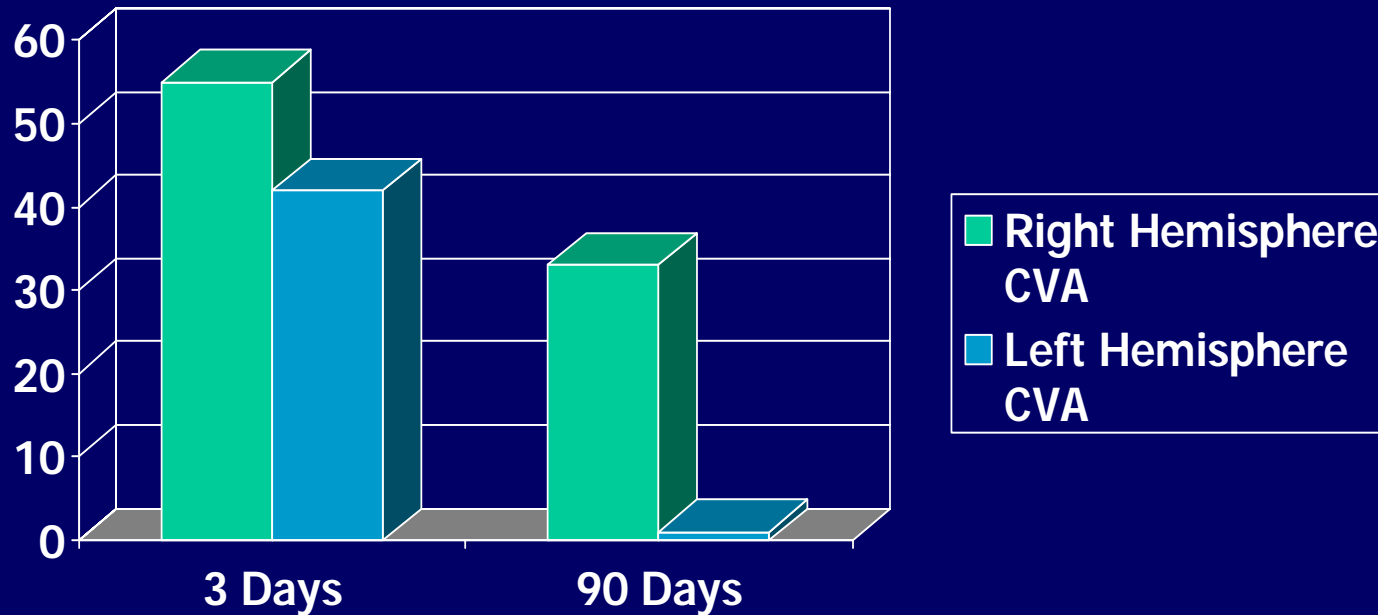


Hemispacial Neglect

- 
- Right hemisphere dominates attention within entire extra-personal space
 - Left hemisphere directs attention to only the right hemi-space
 - Left hemi-neglect is more frequent, severe, and persistent-
 - Hemi-neglect considered a left field disorder
 - With or without left visual field defects
 - Defect of “looking” not of “seeing”
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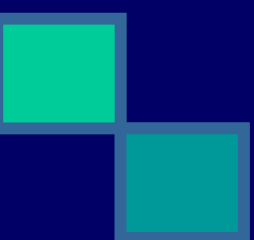

Recovery from Hemispatial Neglect-

Percentage showing neglect (Stone et al 1991)






Hemisppatial Neglect Characteristics

- 
- Ignore visual stimuli to the left
 - Fail to explore to the left
 - Miss food on plate
 - Miss the beginnings of lines of print
 - Incomplete copying
 - Self-care issues
- 




Degree of Adaptation to Field Defects

- Recovery
 - Self-directed
 - External prompting
 - Recalcitrant Neglect
- 



Traditional Assessment Techniques


- Confrontation Fields
 - Fingers, Simultaneous, Red Cap
 - Tangent Screen
 - Goldmann Perimeter
 - Amsler Grid
 - Auto Perimeter
- 



Clinical Assessment




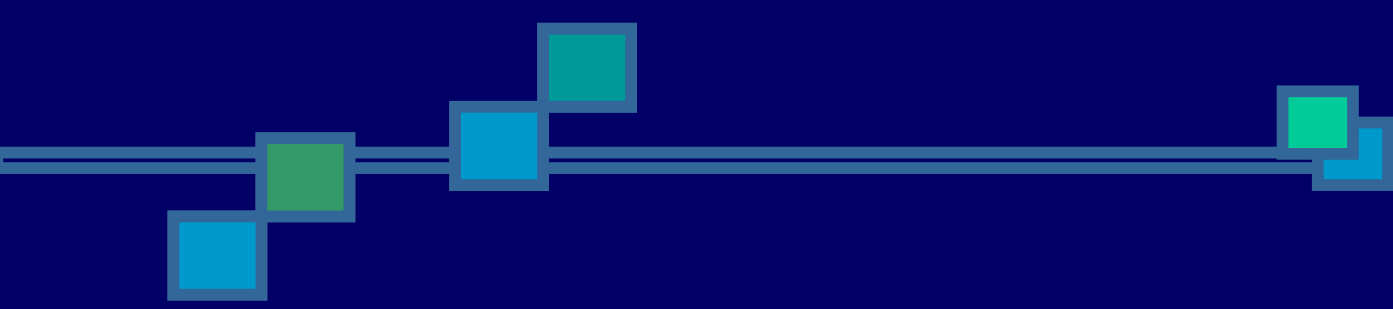
■ Ocular Pursuits

- ROM- full, restrictions, skew
 - Quality- smooth, choppy, nystagmus, unorganized
 - Initiation- prompt, delayed
 - Attention- sustained, fleeting
 - Variation- in different quadrants/across midlines
- 




“Finger-Touch” Confrontation Fields

- Touch examiner’s finger in alternate quadrants
 - Use good side as the “distractor”
 - Searching in affected quadrants
 - Eyes turns to “good side”
 - Head turns to “bad side”
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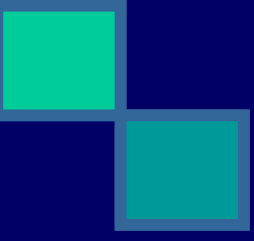



“Distracted” Field Testing

- Attend to hand in one field
 - Touch hand in opposite field
 - “Uncovers” adaptations
 - Demonstrates the problem
- 




“Face Fields” for central defects

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- Face patient at arm's length
 - At arm's length- face subtends ~10 degrees
 - Nose is the central fixation target
 - Do you see my face better to the right/left/top/bottom? Or all the same?
- 




Hemianopsia Chart

- **Harts Chart-** 10x10 (8 ½ x 11)
 - Table top test
 - **Precision Vision Chart-** 9x9 (40" x 40")
 - At one meter- yields a single central target
 - To “quantify” functional adaptation to field loss
 - To evaluate effect of interventions
 - To follow changes over time
 - 3 Subtests- Centration, Saccadic-Margin, Tracking
- 



Hemianopsia Chart: Centration Sub-Test

- Midline Shift- Padula
 - Perception of "straight ahead"
 - Normally a function of equal fields to each side
 - "Which letter is in the very center?"
 - Letters are ~3.5 degrees apart laterally/vertically
 - Letters are ~5 degrees apart diagonally
- 




Hemianopsia Chart: Saccadic-Margin Sub-Test

- Lateral awareness
- Concept of "Drift"
 - Either affected field intrudes, or,
 - The "normal field" drifts away
- Read first and last letter on each line
- Avoid tactual support
- # of letters missed as a %




Hemianopsia Chart: Tracking Sub-Test

- Directed tracking across a full line
 - Reading “into” and “out of” the scotoma
 - Read first line left to right
 - Read next line right to left
 - Count # of letters read fluently
- 



Lateral Awareness Tests

- Bernell Near-Point Maddox Rod Card
 - Line Bisection test
 - Circle the letter test
 - Picture copy test
 - Self-directed *vs.* prompted *vs.* neglect
- 

Kirshner Visual Performance Test

■ aer	rea	ear	aer
■ bcd	bcd	cdb	dcb
■ xlm	mlx	xlm	lxm

- 3 sets/ test page
- # completed in 60 sec
- Can use different treatment approaches to determine benefit
- Determine speed and accuracy



Optical Treatment Options

- **Mirrors- yuk!**
- **Prism**
 - **Ground-** molded, inserted, glued, franklin
 - optical abberations, swim, tilt, chroma
 - **Fresnel-** reduced acuity, contrast, glare, yellow, fall off
- **Yoked- repositions single image- reading?**
 - Full diameter, Segment
 - Lateral, vertical
- **Segment- creates monocular diplopia- mobility?**
 - **Gottlieb-** lateral
 - **Peli-** altitudinal
 - **In-Wave** (Chadwick Optical)

Peli

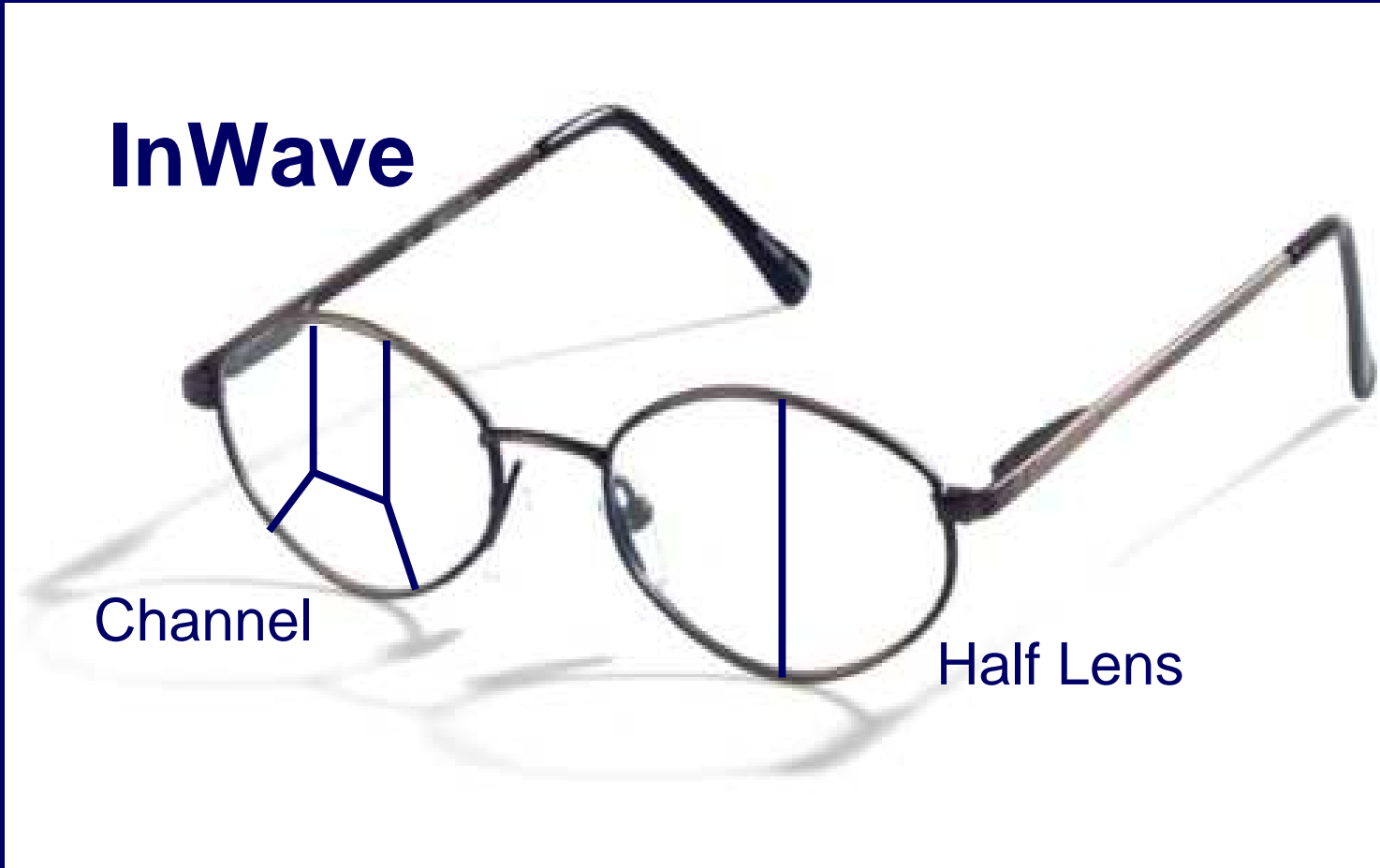


Gottlieb

InWave


Channel

Half Lens






Non-optical Reading Treatment Options

- Rotate Page
 - Reading guide with margin guide (dog-leg)
 - Reposition page toward better field
 - Highlight margin
 - Finger support
 - Avoid bifocals, especially progressives!
- 



Training Techniques

- Alternate field finger touches
 - Card sorting, by suit, by value
 - Solitaire
 - M&Ms- spread on bad side, cup on good side
 - Canceling the "e"
 - Reading with a listener
 - Mobility with sighted aide-
 - victim holds guide above elbow
- 

The background is a solid dark blue. It features several decorative elements: a horizontal line with several squares of varying shades of teal and blue placed at irregular intervals above it; a cluster of two squares on the left side; and a cluster of two squares on the right side. The text 'Thank You!' is centered in a large, stylized, light blue font with a white outline and a slight shadow effect.

Thank You!