Visual Impairments
Stroke and Vision

South Island Stroke Education Day
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Ocular effects of stroke

• Decreased visual acuity
• Visual field defects
• Disorders of eye movements
• Visual neglect
• Visual hallucinations
• Other ocular pathology

Sally Jone, Roger Shinton Improving outcome in stroke patients with visual problems. Age and Ageing 2006; 35: 560-565
Risk factors for stroke manifested in eyes

- Diabetic retinopathy
- Hypercholesterolaemia
  - Xanthelasma
Hypertensive retinopathy
Stroke and visual problems

- Decreased visual acuity
- Visual field defects
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- Visual neglect
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- Other ocular pathology
Decreased Visual Acuity

- Refractive error - glasses
- **Cataract**
- Glaucoma
- Age-related Macular Degeneration (ARMD)
- Retinal detachments
- Central retinal vein occlusion
- Visual Field Defect affecting central vision
Glasses

- Refractive error
- Cataracts
Decreased Visual Acuity

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Visual field defect affecting central vision
VA 6/36 R and L
Stroke and visual problems

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Homonymous Field Defect in Stroke

- Incidence of VFD in acute stroke 20%
  - Implications for driving
  - ADL
  - Falls risk
  - Reading

- As important as hemiparesis

- Recovery:
  - Maximal in first month
  - 50% in first 3-6 months
  - After this, possible, slower rate
Homonymous Field Defect in Stroke

- Occipital lobe lesions 54%
- Optic radiation 33%
- Optic tract 6%
- Multiple sites 5%
- Lateral geniculate body 1%

Figure 2. Neuroanatomy of the visual pathway and the blood supply. Lesions at a particular site of the visual pathway result in a specific visual field defect depicted on the right hand side.
BF

- CT scan: Right occipital lobe and temporal lobe infarct
- Consistent with “pie in the sky” VF defect
  - When? No event
  - Has been driving
Fixation Monitor: OFF
Fixation Target: Central
Fixation Losses: 0/0
False POS Errors: 1/11
False NEG Errors: 1/11
Test Duration: 05:15
Stimulus Intensity: 10 dB

Stimulus: III, White
Background: 31.5 A/SB
Strategy: Two Zone
Test Mode: Single Intensity

Pupil Diameter: Visual Acuity:
RX: DS DC X

Date: 24-07-2015
Time: 10:47 AM
Age: 76

Eye Department
Christchurch Hospital
Ph 03 3641470

- Seen 96/120
- Not Seen 24/120
△ Blind Spot
Esterman Efficiency Score: 80
Visual Field Defect and Reading

- Hemianopic alexia
- Left HH VFD
  - Difficulties finding the start of the next line
- Right HH VFD
  - Slower reading speed
- Ruler to keep track of line
- Turning the page 90 to read vertically
Visual field defect

Prisms:
• Visual field relocation
• Visual field expansion

Figure 2. A prism shifts the visual world toward its apex.

Figure 4. Prism placement for right-sided hemianopia.
Visual field expansion

- 40PD sector prism on affected side of VFD, superiorly/inferiorly/both
- Objects from blind VF constantly above or below
- Diplopia is peripheral
  - Less distracting (?)
- Training to touch objects
- + Visual Retraining Therapy (VRT)

*Figure 6. Example of monocular “Peli Prism” used in left-sided hemianopic field expansion.*
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Disorder of eye movements

- Cranial nerve palsies
  - III, IV, VI

- Conjugate eye deviation towards affected hemisphere (acute stroke)

- Brain stem stroke
  - Infranuclear cranial nerve palsies
  - Supranuclear gaze disorders
  - Internuclear ophthalmoplegia
  - Nystagmus
  - Ocular dysmetria
Disorder of eye movements

• Presentation
  – No symptoms
  – Blurred vision
  – Diplopia
  Double vision
  – Both eyes open
  – Resolves either eye closed

• Management
  – Occlusive patch
  – Prism
    • Temporary Fresnel (orthoptist)
    • Glasses
  – Surgery
  – Opaque contact lens
Management

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- Prism
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- Fresnel prisms
Nystagmus

- Asymptomatic
- Oscillopsia

- No treatment
- Medical treatment
- Surgery
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Visual Neglect

• Spatial inattention to one side of the body
• Defect in dominant parietal lobe – commonly left side
• Can occur with or without homonymous VFD
• Prevalence varies
• Natural history – many improve spontaneously
  – Rarely observed at 6 months

• Occupational therapy

• Other strategies
  – Scanning
  – Monocular patching
  – Visual stimulation
  – Prisms
  – Studies small/evidence lacking or pilot studies
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# Visual Hallucinations

## Charles Bonnet Syndrome
- Assoc with visual impairment
- Formed e.g. flowers
- Unformed
- Patients have insight
- Some don’t mention
- Reassure – not crazy!
- Generally improve
- Turn on lights, look away, blink, eye exercises
- [http://www.rnib.org.uk/eye-health-eye-conditions-z-eye-conditions/charles-bonnet-syndrome](http://www.rnib.org.uk/eye-health-eye-conditions-z-eye-conditions/charles-bonnet-syndrome)

## Anton Syndrome
- A form of cortical blindness
- Bilateral cerebral infarcts
- No insight, denial
- Confuse old visual experiences for current ones
- Associated with profound cognitive impairment
  - Memory loss, confusion
Figure 2 and 3. Radiological findings: Axial sections of MRI showing altered signal in the left temporoparietooccipital lobes and right occipital lobe suggestive of a large subacute infarct in the left temporoparietooccipital lobe involving P2 segment of PCA and a gliotic lesion (chronic infarct) in the right occipital lobe.
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Vision problems and stroke

• Activities of daily living (ADL)
• Falls risk
• Rehabilitation

• Visual problems corrected and improved with intervention

• Multidisciplinary input
  – Physicians
  – Nurses
  – Physio, OT, SLT
  – Optometrist, ophthalmologist, orthoptist