Vision Impairment Conference for Educators 2014
There’s more to measuring vision than Visual Acuity

Ursula White BSc(Hons)MCOptom
Visual Fields

Definition: The field of vision is that portion of space which is visible to an individual at any given moment.

Normal visual field

• 100 degrees temporally to central Fixation
• 60 degrees nasally
• 60 degrees superiorly
• 75 degrees inferiorly
Some causes of visual field defects in children

- Cerebral Visual Impairment (CVI)
- Retinopathy of prematurity
- Stargardt’s disease
- Congenital glaucoma
- Retinitis pigmentosa
- coloboma
- injury
Measurement

• Automated perimeters used in general Optometry/Ophthalmology
Measurement in our clinic
Measurement in our clinic
Scotoma

"Can you hear this?" Mouse mumbled into his pillow.

"Yes!"

"Amazing. How about this?"
Mouse said from under his pillow.

"Quiet!"
Scotoma
Hemianopia
Peripheral vision loss

"Amazing. How about this?"
Mouse said from under his pillow.

"Yes!"

"Quiet!"
Peripheral vision loss
Implications of visual field loss

• Navigation is difficult: bumps, trips, get lost/disorientated.
• People and things suddenly “jump” into view.
• Difficulty following lines of text.
• Difficulty crossing road.
• Driving restrictions when older.
Mouse slid from his bed, went into the wardrobe, closed the door and said in the tiniest possible voice into the furthest, darkest, teeniest possible corner of the wardrobe, “Surely, you can’t—”
Reduced sensitivity
Causes

• Cataracts
• Common in Cerebral visual impairment
• Often present to some extent with macular or retinal conditions eg. Stargardt’s,
• retinopathy of prematurity – may be more associated with low birth weight neurological damage than retinal damage.
Measurement

• Hiding Heidi
Normal contrast sensitivity
Reduced contrast sensitivity
Implications of reduced contrast sensitivity

- General difficulty with tasks, particularly in dim light conditions/glare
- Can explain difficulty out of proportion with regular visual acuity
- Often goes undetected.
- Navigation may be particularly difficult.
- Difficulty with poor contrast print – green pens!
Depth Perception/Stereopsis

• If both eyes are working as they should, the slightly different placement of one eye from the other (distance between the eyes) creates two slightly different images which the brain then processes.

• This allows us to perceive “depth” or to see in 3D.
Causes

Anything which interferes with vision in one eye, eg.

• Droopy eyelid
• cataract in one eye
• disease at the back of the eye
• an eye which has not developed properly/completely.
Depth Perception/Stereopsis

• Important that children’s depth perception is checked, as they are not always aware of an impairment in one eye.
• Can often be treated with patching, if detected in early childhood.
• Depth perception defects/reduced stereopsis is more common in children with visual impairment.
Depth Perception/Stereopsis
Implications of reduced depth perception

- Difficulty with navigation eg. Steps
- Difficulty reaching for things – may over/undershoot: perceived as clumsy.
What you many observe

- Clumsy child who trips/falls/spills things a lot: field defect, poor contrast sensitivity
- Misses things/struggles to find things that are right in front of them
- Seems surprised/alarmed when approached

None of the above are diagnostic of VI, but they can be signs.
Scotoma
Hemianopia
Peripheral vision loss
Questions?
Thank You!