

BLENNZ and the role of Optometrists in paediatric visual impairment

Dr Samantha Simkin PhD BOptom Hons

Post-Doctoral Research Fellow, BLENNZ

Stevenson Post-Doctoral Research Fellow, University of Auckland

Paediatric Optometrist, Poppet Optics in the Matthews Group



History

1891 Jubilee School est Auckland

1965 Homai College for the Blind

1999 Homai became a state school

2005 BLENNZ established



Blind and Low Vision Education Network NZ

Vision

Every BLENNZ learner (ākonga) is well prepared to achieve in life

Mission

To enable learners who are blind, deafblind or have low vision to reach their full potential, BLENNZ provides quality education and specialist teaching services in partnership with whānau, educators and the wider community



1. To provide all ākonga who are blind or low vision with:
 - a range of educational **options**, supporting inclusion in the learners community
 - access to these options throughout their education, according to **individual need**.
2. To establish **one coordinated organisation** to provide
 - innovation through pooling of resources
 - a united workforce with a shared vision
 - consistent, cohesive learner focussed services



BLENNZ



- BLENNZ is funded by the Ministry of Education
- Children from birth to 21 years of age (whilst they are still in education) can access BLENNZ
- BLENNZ offers a multitude of services to those who qualify
 - Best corrected visual acuity 6/18 or worse in the best eye
 - Significantly reduced visual fields

Population of BLENNZ Learners 2018

- 1554 total population
- 98% educated locally

BLENNZ Regional Resource Centres



ORS Funding – Vision only

- Vision must be the main need
 - No other significant disability
- Clinical acuity of 6/36 or worse (both eyes open)
- Learners are categorised to high or very high needs
 - High needs receive a half day per week of specialist teacher time (RTV)
 - Very high needs receive a full day per week with RTV
- If ORS qualified then a moderation process determines if further teacher aide help is provided

**NOTE: Children do not qualify for ORS still
have access to BLENNZ services**



National Assessment Service

NAS is a multi-disciplinary team of health and educational specialists

Comprehensive assessment of the child's current developmental status

- Optometrist
- Ophthalmologist
- Functional sensory teacher
- Strategies and Tools for learning teacher
- Paediatrician
- Educational Psychologist
- Speech Language Therapist
- Physiotherapist
- Orientation and Mobility
- Adaptive Daily Living Skills
- Music Therapist




National Assessment Service

- The service offers a comprehensive assessment
- Provides recommendations to support local health and educational input
- Assessment is offered during term time in Auckland
- Two 'away' visits a year to regional locations



Referrals

- Optometrists can refer directly to BLENNZ
- Generic referral form or referral letters are accepted
- Can discuss with family if they would also like to be referred to the Blind Foundation
- Would recommend getting to know your local VRC

**BLENNZ**
.....

Blind and Low Vision Education Network NZ
Te Kotuituinga Mātauranga Pura o Aotearoa

REFERRAL FORM
Please complete as much of this form as possible

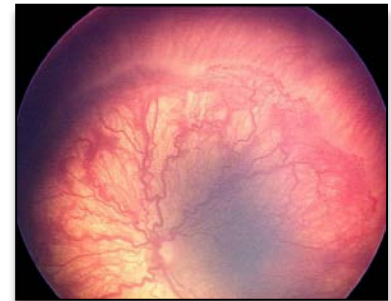
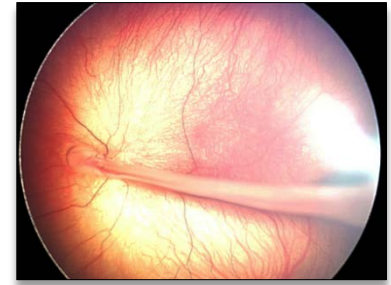
BLENNZ

BLENNZ works in partnership with whānau, education and community so that children and young people with visual impairments reach their potential for growth, independence, participation and have opportunities for success within their community.



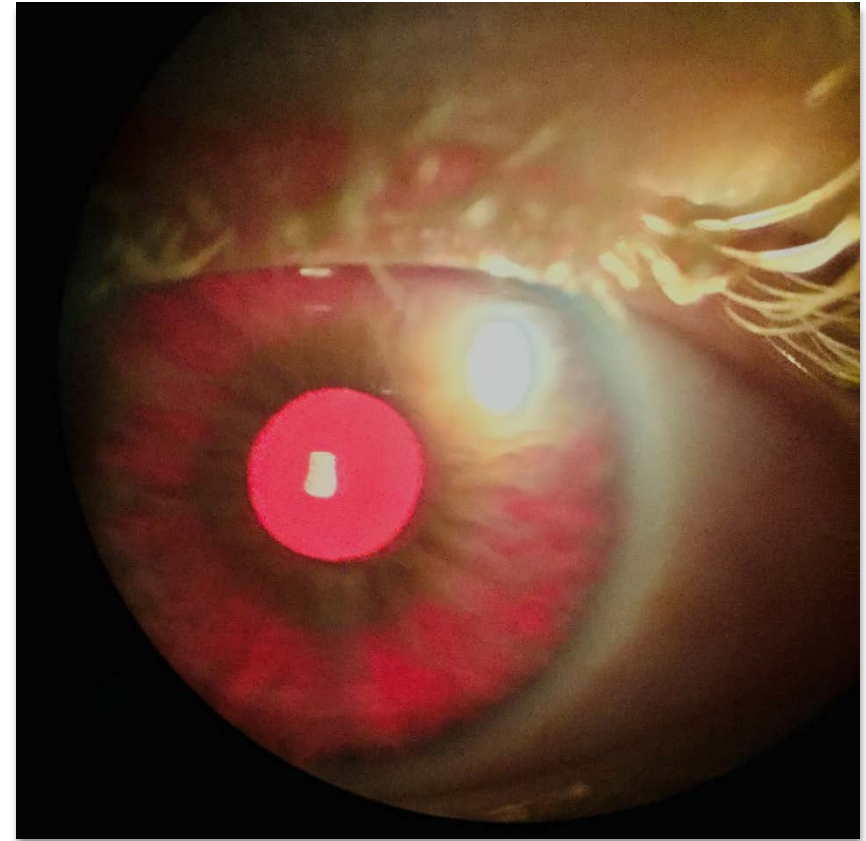
Paediatric Visual Impairment

- 19 million children worldwide are visually impaired
- 1.4 million children are blind
- Social, economic and emotional impacts
- The majority of cases can be treated or prevented
- Equivalent number of blind years as cataract



Common conditions (for BLENNZ)

- Albinism
- Optic Nerve Hypoplasia
- Cerebral Visual Impairment



ALBINISM



Albinism

A genetic condition characterized by a deficit in the production of melanin with a partial or complete absence of pigment in the skin, hair and eyes.

- Reduced pigment
- Iris trans-illumination and photophobia
- Foveal hypoplasia
- Pendular nystagmus
- Abnormal decussation of visual pathways with up to 90% of fibres crossing
- Strabismus
- Refractive errors moderate to high myopia, hyperopia and astigmatism are common



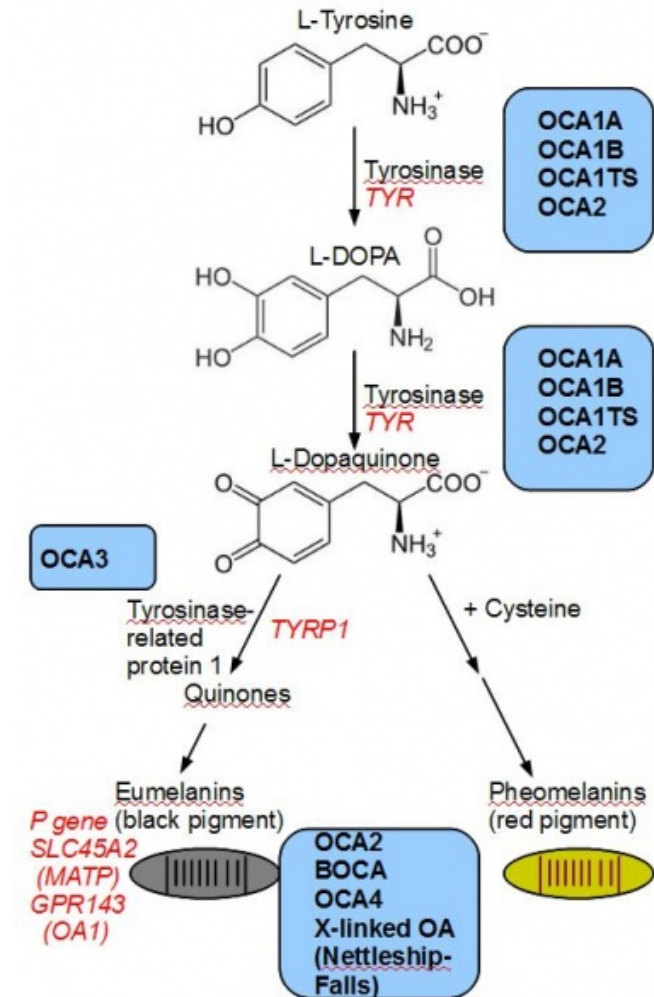
Oculocutaneous Albinism

- Most common type of albinism (90%)
- Affects eye, skin and hair
- Vision 6/12-6/120
- 7 genotypes all autosomal recessive inheritance
- Generally divided phenotypically by tyrosinase positive or negative



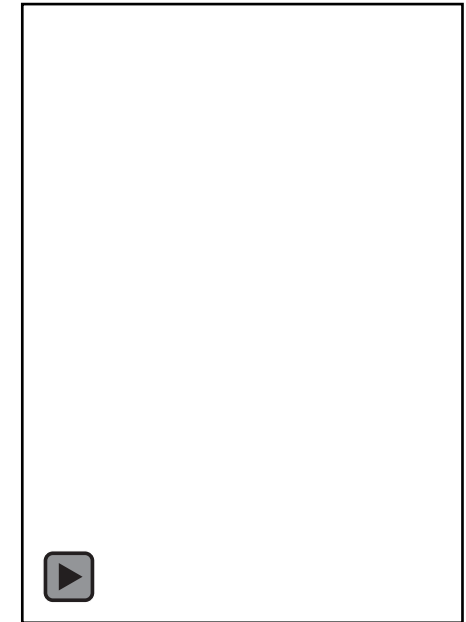
Ocular Albinism

- 10% of albinism
- ~1/50,000 males – X-linked
- Vision 6/12-6/120 (tends to be severe)
- OA Type 1:
 - GPR143 gene defect
 - Female carriers have spattered fundi
- OA Type 2:
 - Aland Island eye disease
 - Same as OA1 + protan defect + defective dark adaptation



Albinism Case Example

- 14y/o Asian Female with diagnosed OCA
VA 6/60, BCVA 6/24+
RE +2.50/-2.50 x 005 (6/30+)
LE +3.00/-2.75 x 174 (6/30+)
- Severe glare
- Pendular nystagmus with null point in right gaze with convergence dampening
- Studying for exams



Albinism Management

- Consider and measure the benefit of correction
- Glare reduction options
- Magnification options
 - Near add
 - Magnifier
 - iPad
- Referral for Kestenbaum procedure?
- Support services
 - BLENNZ
 - MoE for exam consideration
 - University disability supports

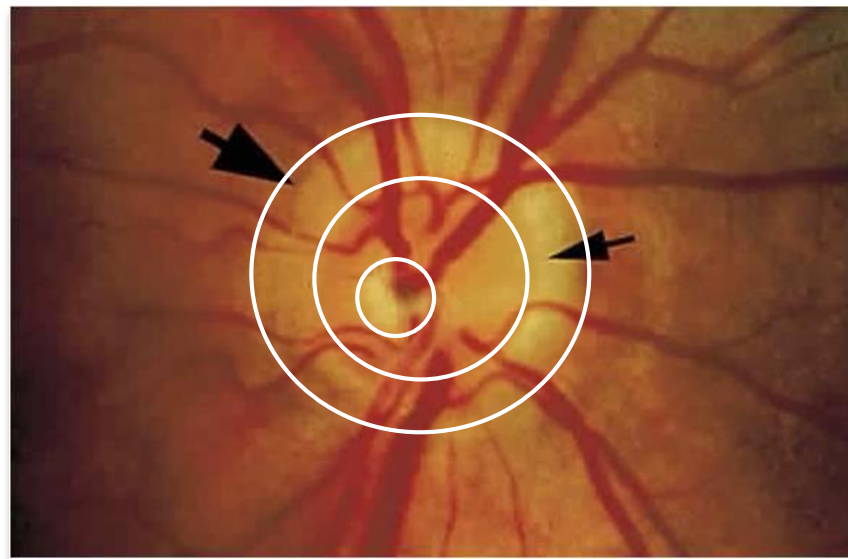


OPTIC NERVE HYPOPLASIA



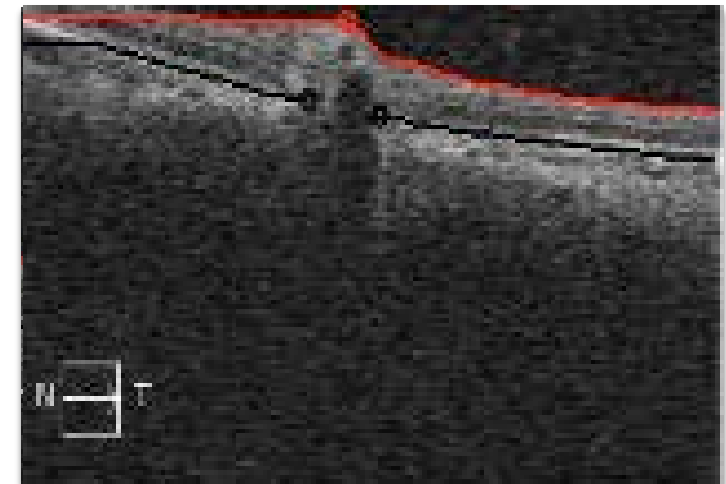
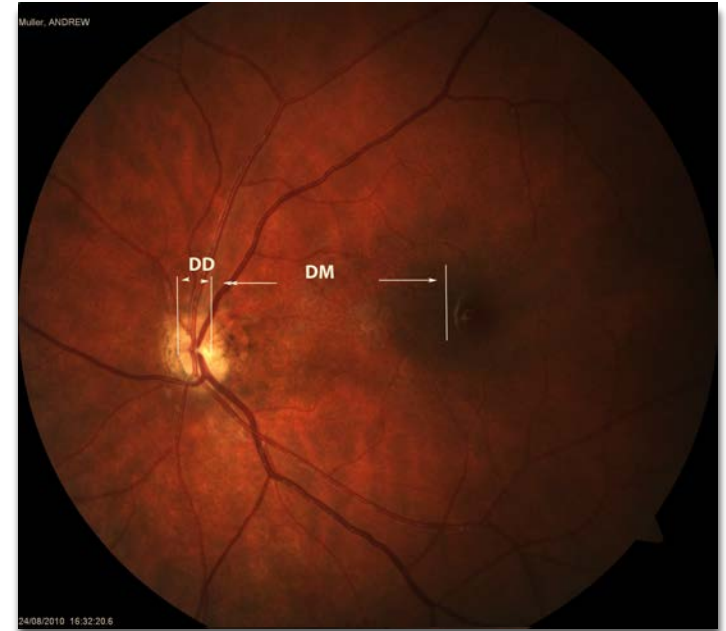
Optic Nerve Hypoplasia

- An under-developed optic nerve
- Disc diameter less than one third of disc to macula distance
- May have 'double-ring' sign
- Vision can range from slightly reduced to blindness



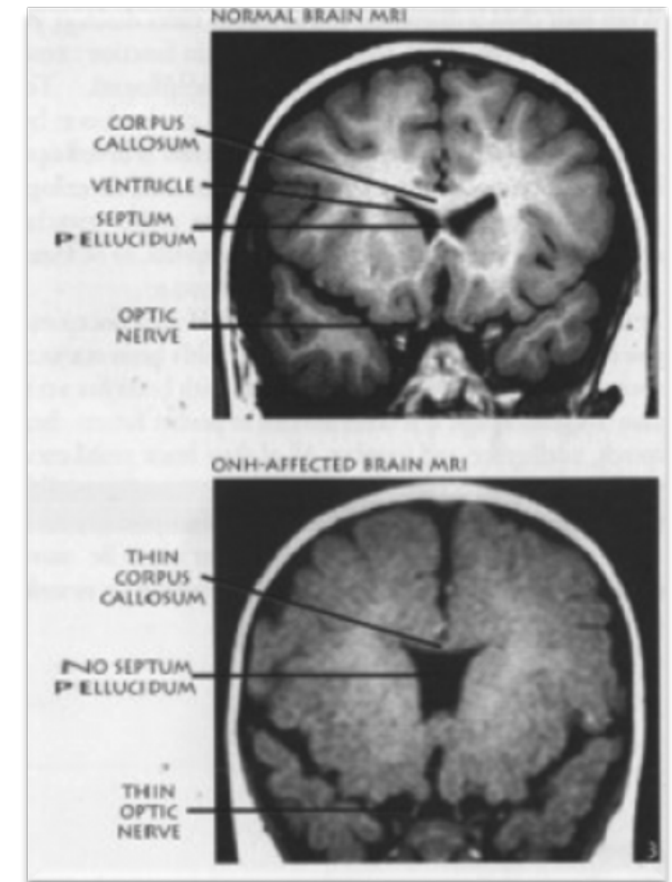
Optic Nerve Hypoplasia

- One case reported in the USA before 1962
- Now...
 - 12% of severe childhood visual loss in the USA
 - 13% of blind children in the UK
 - 6.3% of BLENNZ enrolments
- Aetiology
 - Unknown
 - Commonly first baby of young mothers



Optic Nerve Hypoplasia - Presentation

Bilateral	Unilateral
Early presentation	Late presentation
Reduced vision	Vision can appear normal
Nystagmus	No nystagmus*
?Strabismus	Strabismus
Failure to thrive	
Midline brain structure anomalies	
Hormonal abnormalities	
Autistic-like behaviours	



60%

ONH Case Example

- 4 year old Caucasian Male
 - failed B4 School Vision Screening
 - VA RE: 6/60 LE: 6/6+
 - Small right constant esotropia
 - CycloRx: +1.00DS OU
- Parents report delay in milestones
- Dilated examination: ?Smaller right optic nerve



ONH Management

- No correction required
- Ophthalmology
 - Confirmation of diagnosis
 - ? Strabismus surgery
- Paediatric
 - Neurology
 - Endocrinology
- Support services
 - BLENNZ – does not qualify as **unilateral**

Bilateral:

- Magnification
- BLENNZ referral
- Nystagmus

CEREBRAL VISUAL IMPAIRMENT



Cerebral Visual Impairment

- Normal eye examination
- Visual processing impaired from neurological insult
- Vision can range from mild impairment to blindness

USA - leading cause of childhood visual impairment

UK - 40-48% of visually impaired children <15 years old



1. Chong C, Dai S. Cross-sectional study on childhood cerebral visual impairment in New Zealand. *Journal of American Association for Pediatric Ophthalmology and Strabismus*. 2014;18(1):71-74.
2. Rahi JS. Childhood blindness: a UK epidemiological perspective. *Eye*. 2007;21:1249-53.
3. Flaxman SR, Bourne RR, et al. Global causes of blindness and distance vision impairment 1990–2020: a systematic review and meta-analysis. *The Lancet Global Health*. 2017;5(12):1221-34.

Cerebral Visual Impairment

- CVI prevalence 0.02% of children in NZ ~30% of severe childhood visual impairment
 - Range of causes:
 - 36% unknown
 - 18% hypoxia/asphyxia
 - 14% other causes
 - 8% non-accidental injury
 - 8% periventricular leukomalacia
 - 8% neonatal infections
 - 8% prematurity
- 41% avoidable**

– History – History – History –

Cerebral Visual Impairment

- Eyes are “normal”
- Co-morbidities are common including: developmental delay, cerebral palsy, hearing loss and epilepsy
- Management
 - Correct significant refractive error
 - Functionally assess visual fields
 - Consider eye movement ability
 - Support visual access in the child’s preferred manner



Functional assessment

Functional visual assessment determines the everyday visual input suitable for the child

- Facial recognition
- Gaze direction
- Colour preference
- Trouble with clutter
- Sessions of vision being 'on' and 'off'



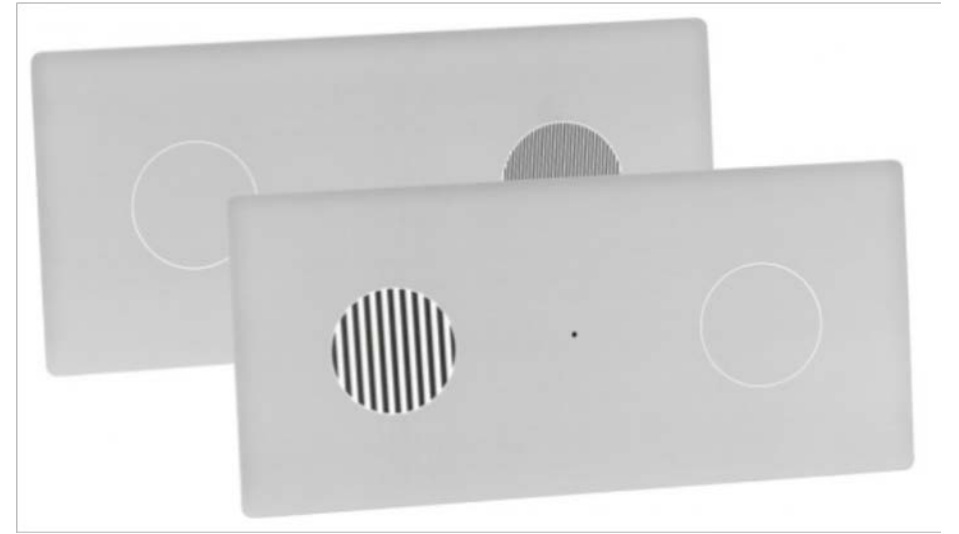
CVI Example

- 14 year old girl with CVI
- Vision measured with Keeler acuity grating

VA RE 6/120 LE 6/150

Rx RE -2.00DS (6/60) LE -2.25DS (6/60)

- Physical disability - cerebral palsy with AHP
- Cognitive delay and epilepsy



CVI Management

- Monitor eye health and refraction
- Consider benefit of refractive correction and impact on life
- Frames and lenses
 - Safety with epilepsy
 - Fit with AHP
 - Positioning in wheelchair
- Referral for underlying condition
- Support services
 - BLENNZ



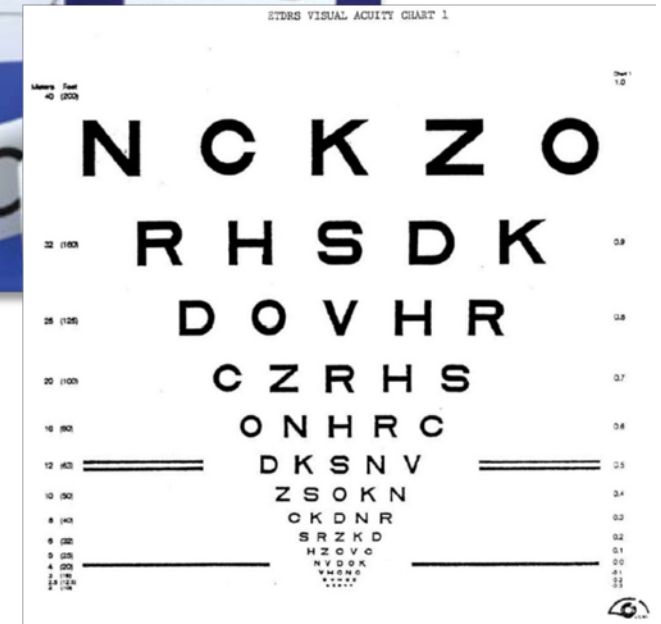
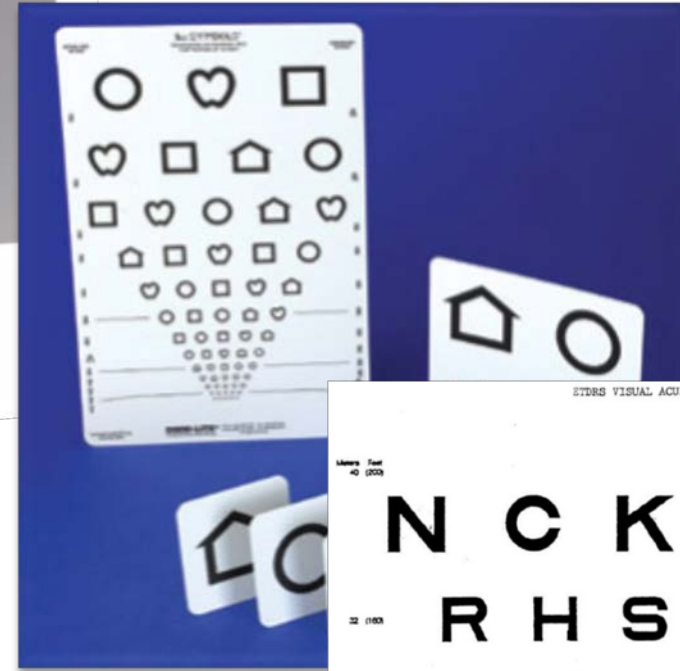
Patient History

- Presenting problem
- Ocular history
- Family ocular history
- General Health
 - Pre, peri and post natal history
 - Developmental milestones
 - Other conditions



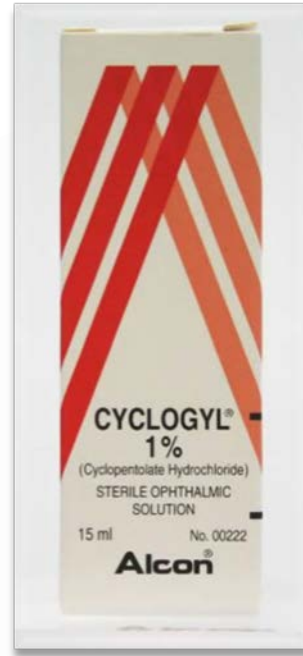
VA Tests

- 6/180 at one month
- 6/6 at 5 years
- Age appropriate tests
- Matching if needed
- Test at an appropriate distance
- Lots and lots of encouragement



Objective Testing

- Cycloplegia
- Retinoscopy
- Binocular indirect ophthalmoscopy



Dispensing

- Fitting
 - Get to their level
 - Natural position
- Appearance
 - Anisometropia
 - Limit minifying and magnifying
- Safety first
 - UV
 - Scratch resistance
 - Impact resistance



Visually Impaired Children

- Nystagmus
- Abnormal head postures
- Tints may be required
- Complex conditions
- Syndromic features
- Associated developmental delays
- Families have a lot going on....prioritise





Consider

- What do I need
- What would be nice
- How can we have fun
- When can I not do it myself



REFERRALS



Our role as Optometrists

- Assess appropriately
- Diagnosis accurately
- Support the patient and family
- Refer as needed
- Advocate to maximise patient outcomes



Referrals

- Optometrists can and SHOULD refer directly to BLENNZ
- Ensures patients get the educational support they are entitled to
- 6/18 or worse in better eye
- Significantly reduced visual fields
- Significantly reduced visual function
- If unsure – refer!

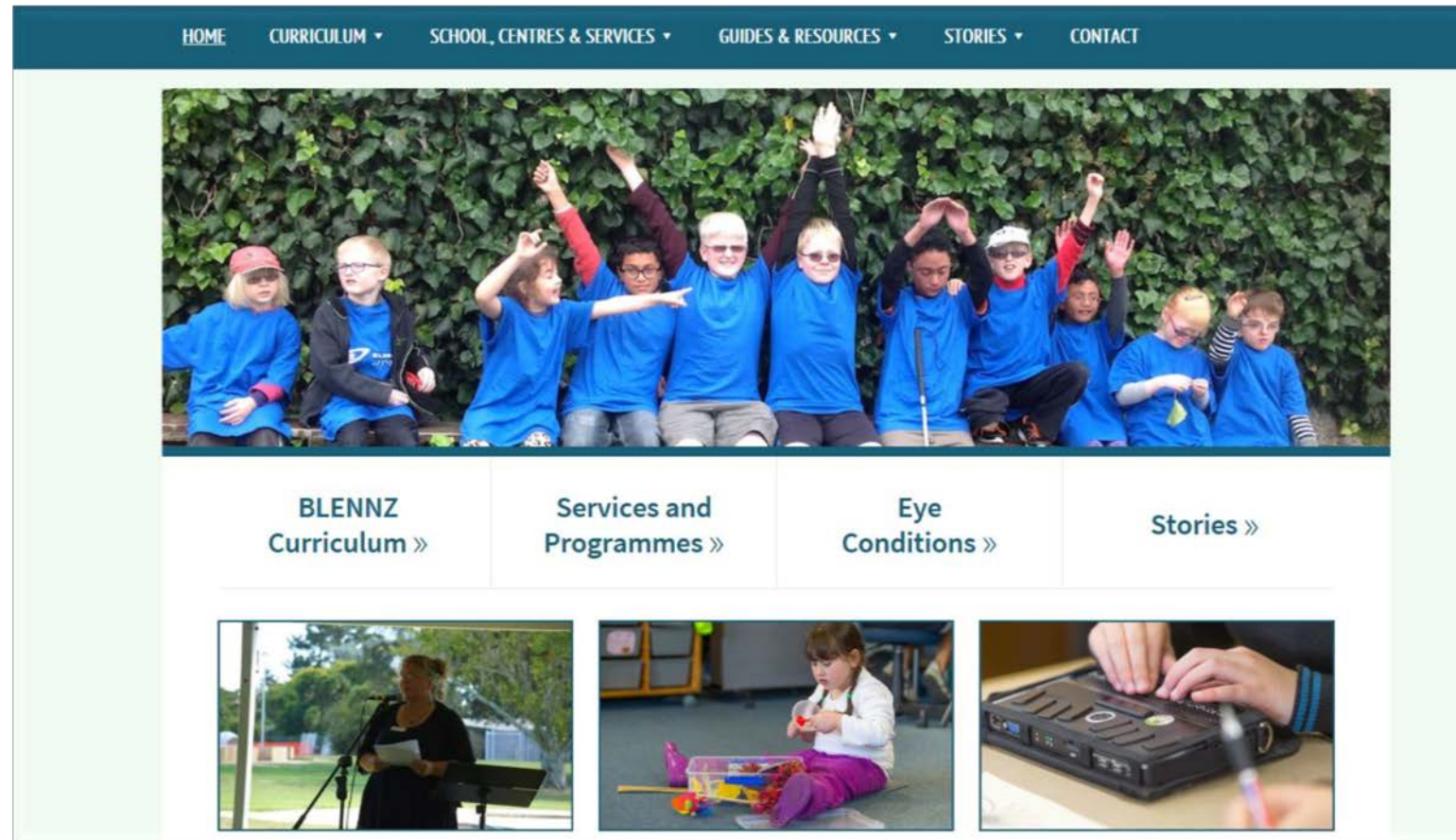


REFERRAL FORM

Please complete as much of this form as possible

Date of Referral:		ORRS:
Child being referred:		D.O.B.:
		Gender:
Ethnicity:	Home language:	NHI Number:
Parents/Caregivers		
Name:		Name:
Address:		Address:
Contact phone numbers:		Contact phone numbers:
Consent given for:		
<input type="checkbox"/> Functional Vision Assessment <input type="checkbox"/> Visual Resource Centre to access clinical eye/medical information <input type="checkbox"/> VRC to share information with MOE/School or Early Childhood setting		
Parent/Caregiver Signature:		
Referring Agent:		
Name:		Date:
Position and Contact:		
Other Agencies involved:		
Reason for referral: (eye condition, acuity, vision concerns etc)		
Other medical/educational difficulties:		
Name of eye and or other specialist:		

BLENNZ Website



<http://www.blennz.school.nz/>

Thank you

