

Assessment of Vision in Children with Disabilities

Day 2, afternoon

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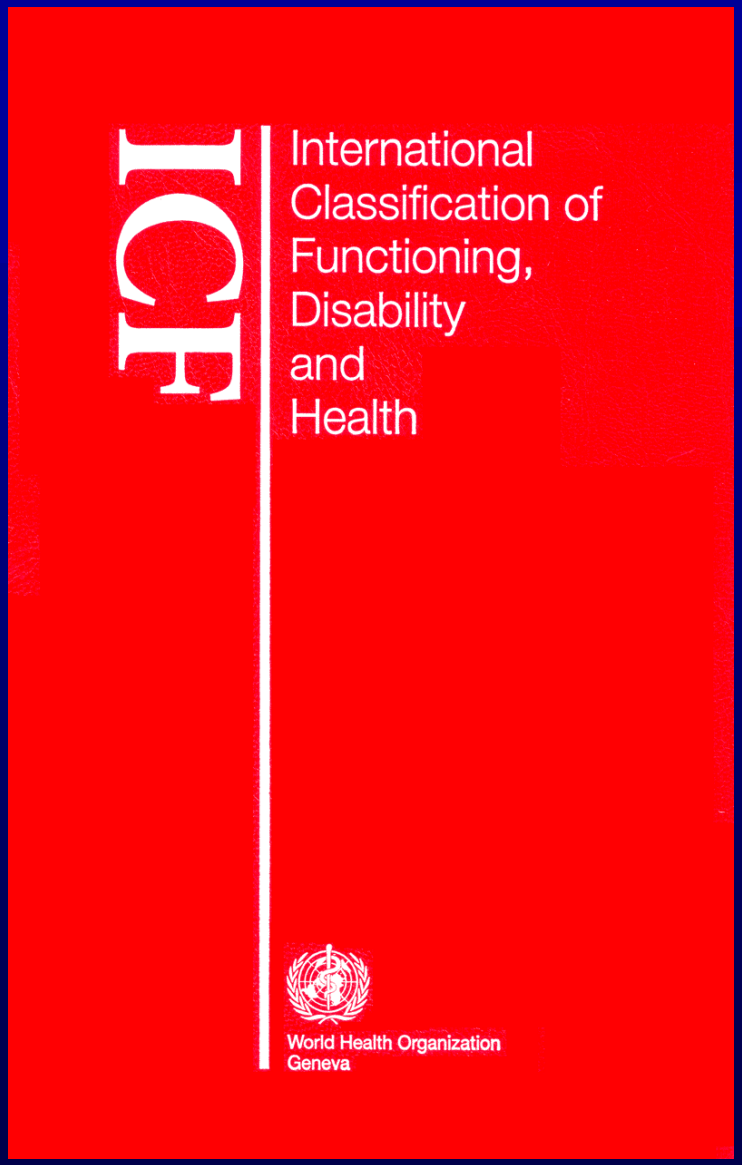
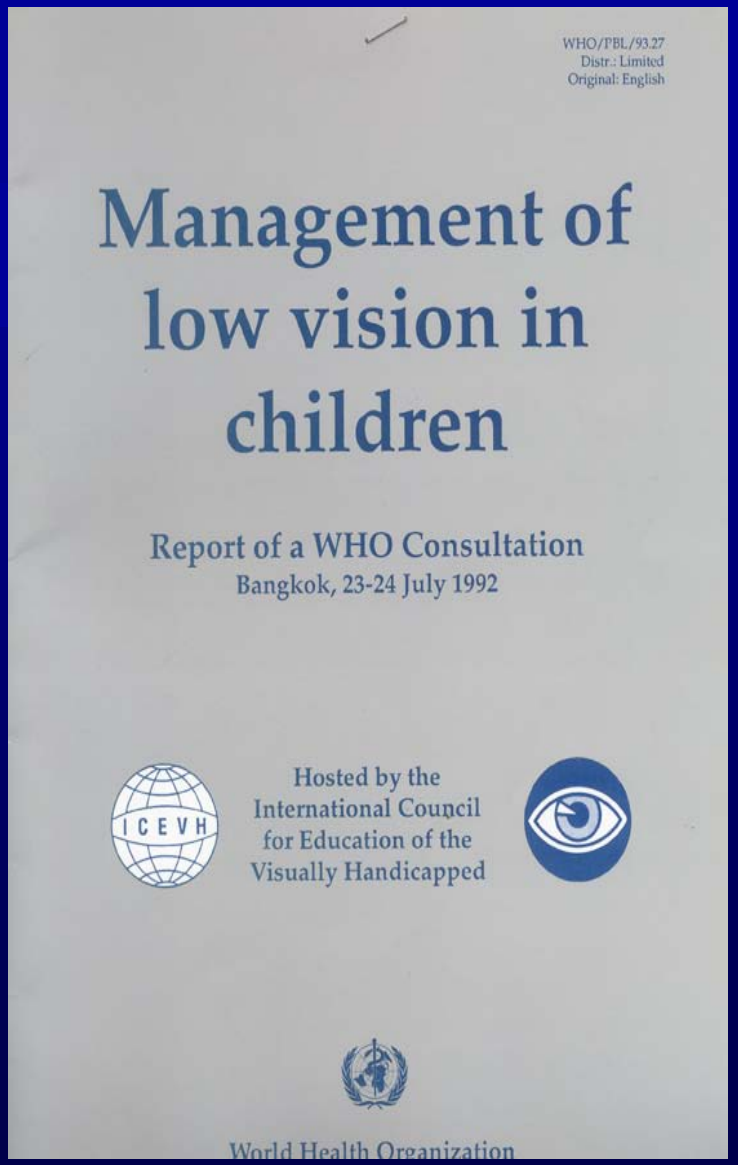
ICF

ICF-CY



9 activites



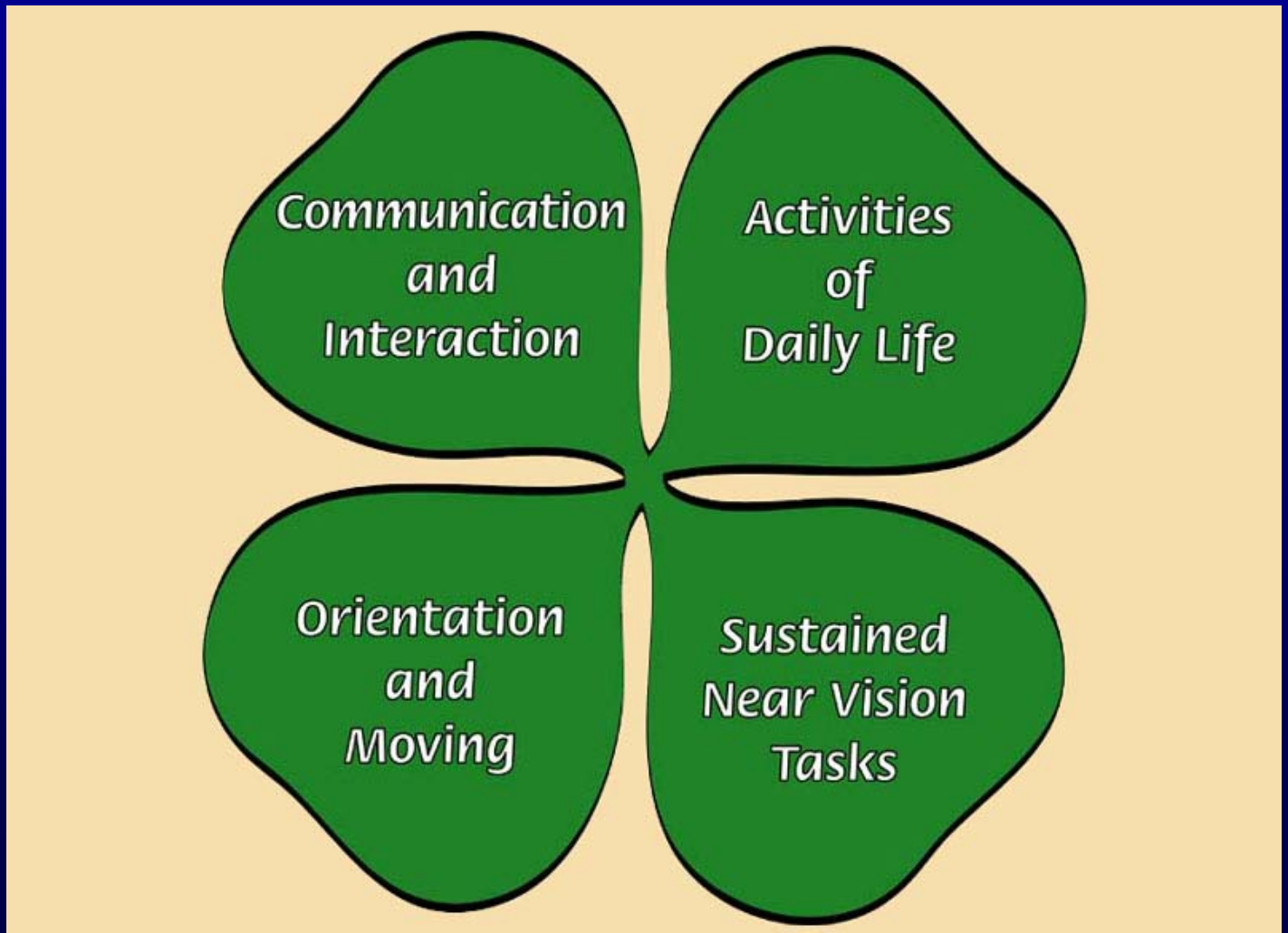
4 activites

ICF$_{2001}$ and ICF-CY$_{2007}$

Nine domains:

- 1) learning and applying knowledge
- 2) general tasks and demands
- 3) communication
- 4) mobility
- 5) self-care
- 6) domestic life
- 7) interpersonal interactions and relationships
- 8) major life areas
- 9) community, social and civic life

Visual Functioning

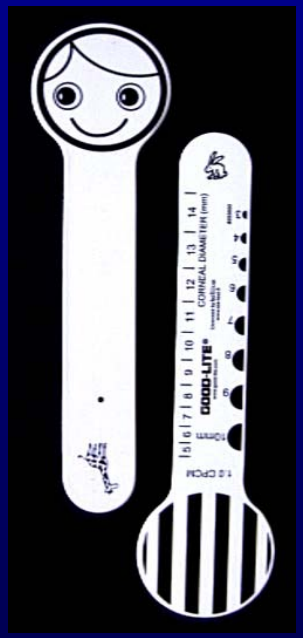


Ocular motor functions

Ocular motor functions

- Fixation of gaze:
  central, eccentric, stable, unstable, lacking (small picture, penlamp)
- Shift of gaze and saccades:
  exact, fast/slow, irregular, lacking
- Following movements and tracking:
  smooth, composed of saccades, lacking, compensated with head movements
- Accommodation:
  normal, insufficient, lacking, spastic, tonic
- Convergence:
  normal (to the tip of the nose), insufficient, eye loses fixation at __cm
- Alignment:
  ortotropia (“straight eyes”), eso/exotropias, -phorias, alternation.
- Nystagmus:
  amplitude and direction

Fixation



Fixation, convergence, accommodation

Accommodation

Compensating accommodation

Facilitation

head control, fixation and accommodation problems

Accommodation & Fixation

too little of capacity

Damping of nystagmus

Tactile exploration, no use of vision

Lack of visual control of movements

Grating acuity 4cpd

Accommodation

dynamic retinoscopy

Fixation and following movements

Fusion

Beren’s 3 picture test

Visual Acuity

Detection acuity, objects

Detection and discrimination GrA

Optotype acuities

near & distance

Optimal reading acuity

”Same – not same”

training wih the LEA Puzzle

eye-hand-coordination

comparison: picture with cut-out

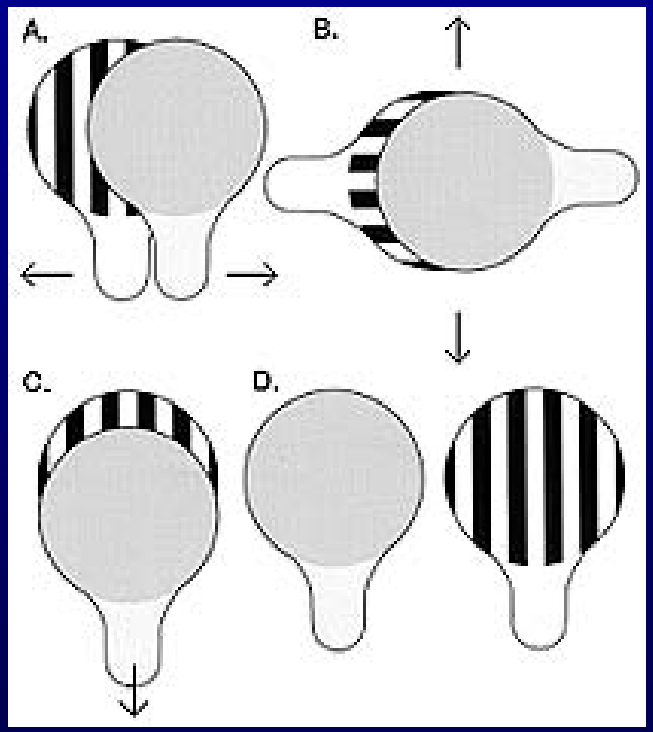
Visual acuity

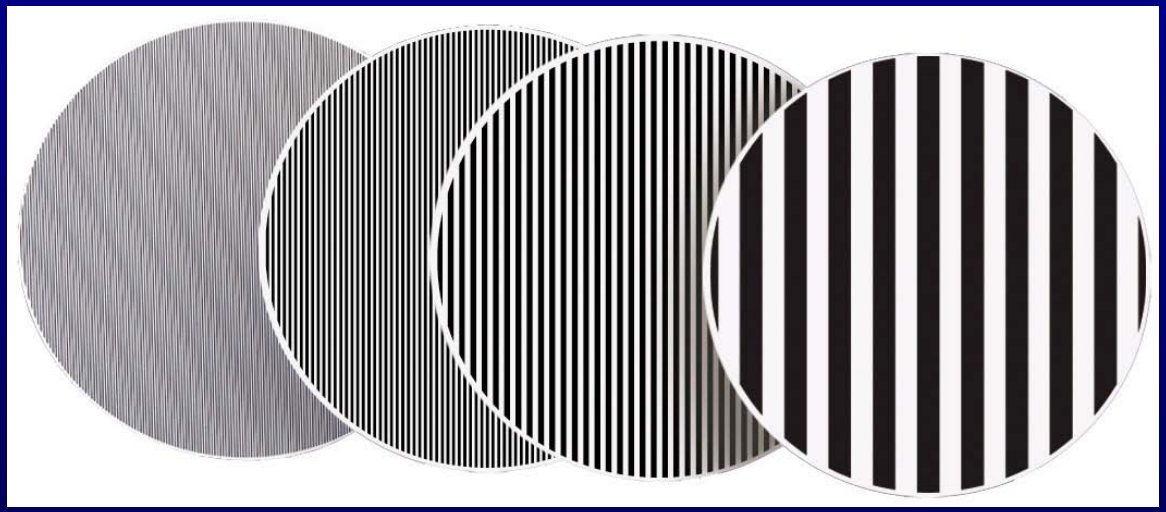
”koirankoppi”/ dog house
VA = 0.04 (6/150)

If the measurement is disturbed the child’s reaction shows it-

Grating Acuity Tests

Detection and Discrimination tests



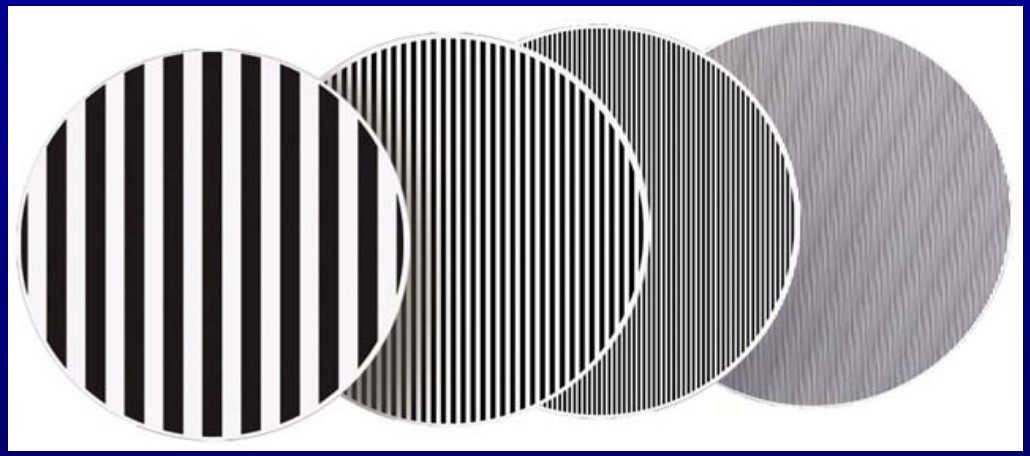


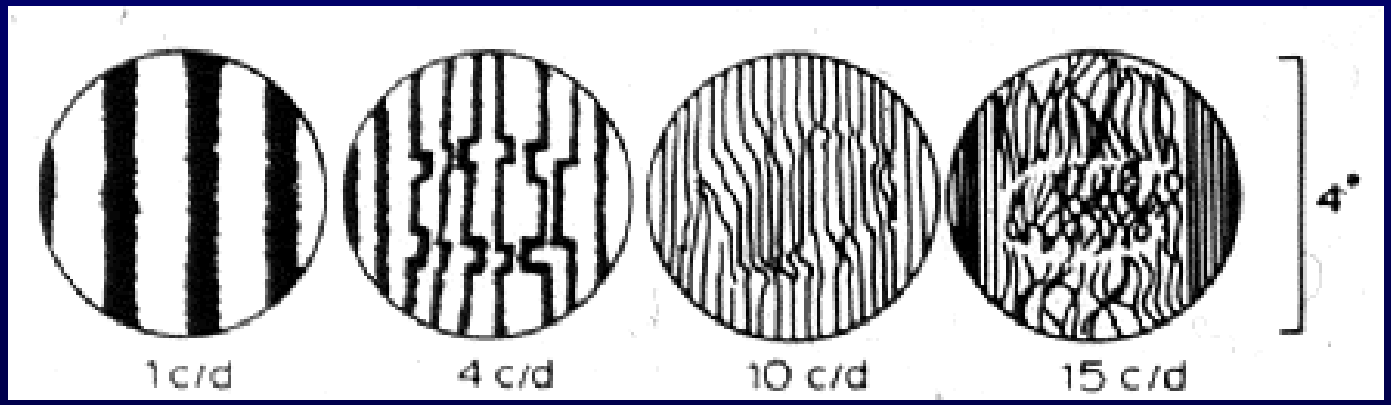
cycles per degree, cpd

Grating acuity values MUST NOT be converted to optotype acuity values.

LEA Grating Acuity Test

Discrimination acuity test





Discrimination is possible even if the lines are distorted.

Grating Acuity Test

Grating acuity 4cpd
Optotype acuity 0.004; 3/750 (not 0.12; 6/50)

Special instrument

for observation of reading strategies

Text on clear film.

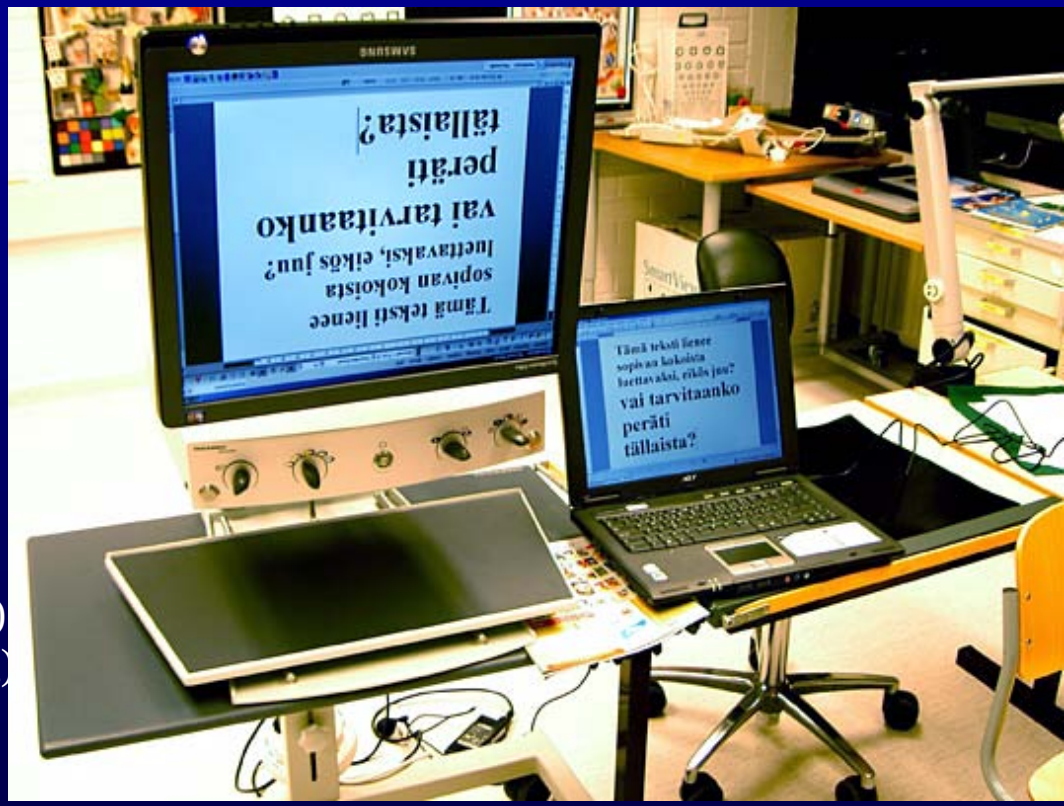
Child’s face and the text are reflected to the camera.

Oculomotor functions

recorded with a special camera system

This boy learned to speak 6 months before this video was taken; letter ”V” is difficult and blocks the use of vision and control of eyes and head movements.

Reading text upside down



Saccades L to R poor, VA 0.01 (50% crowding)
Saccades R to L good, VA 0.05 (50% crowding)
Insufficient accommodation, myopia
0.01= 1/100=10/1000. 0.05= 10/200
visual acuity later 0.1 (= 10/100) at 60cm (2')
(LEA Symbols line test on lightbox)

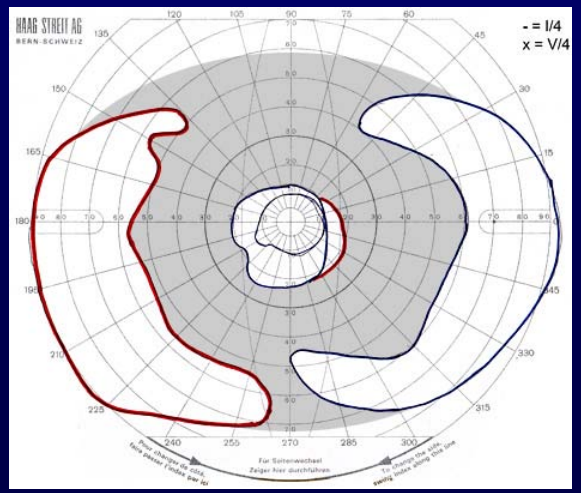
Assisted communication

Eight children needed assistance in communication.

School age

Visual field for communication and O&M

Visual field, visual acuity, contrast sensitivity, vision in dim light (mesopic adaptation). Schoolchildren can demonstrate functioning of their visual field.



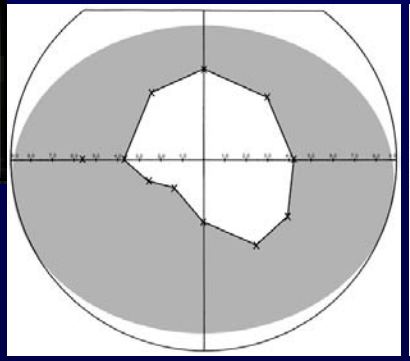
10 cd/m^2

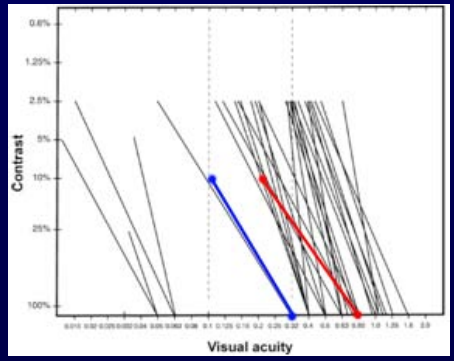
CONE Adaptation test

Constricted visual field

tested by her own therapist in order not to frighten the infant

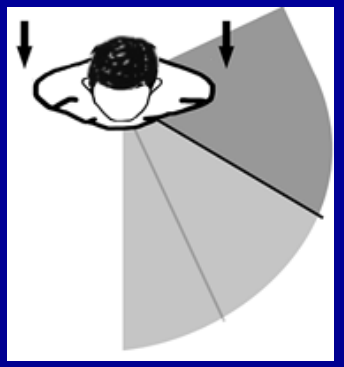
At school 2010:
Nystagmus, head turn to block
Ocular motor functions compensated by head movements
VA 0.3 (10/30), at 10% 0.1 (10/100)
GrA 24cpd, 10% contrast: 7cpd
Visual field with 10Hz flicker





Illuminated ball used by child's own therapist.

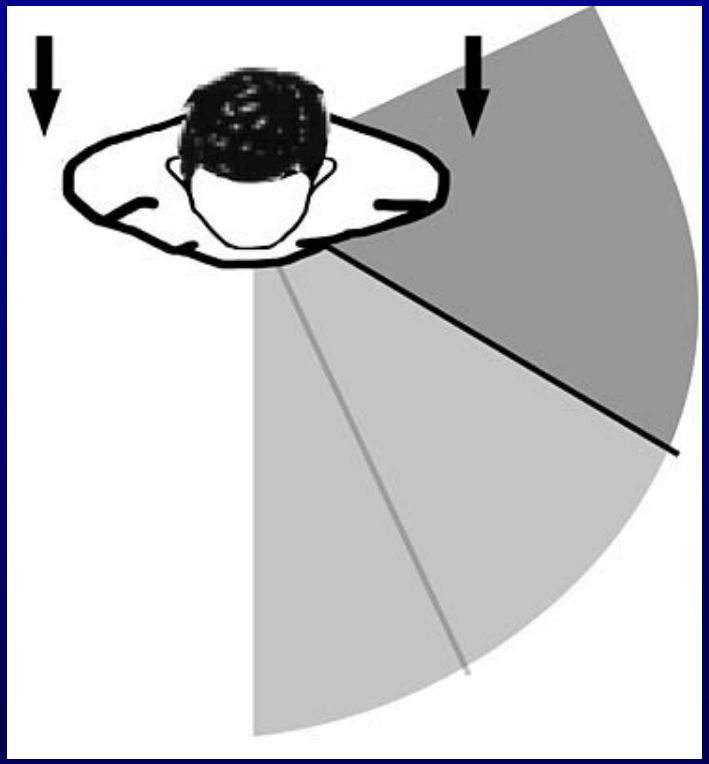
Visual ergonomics



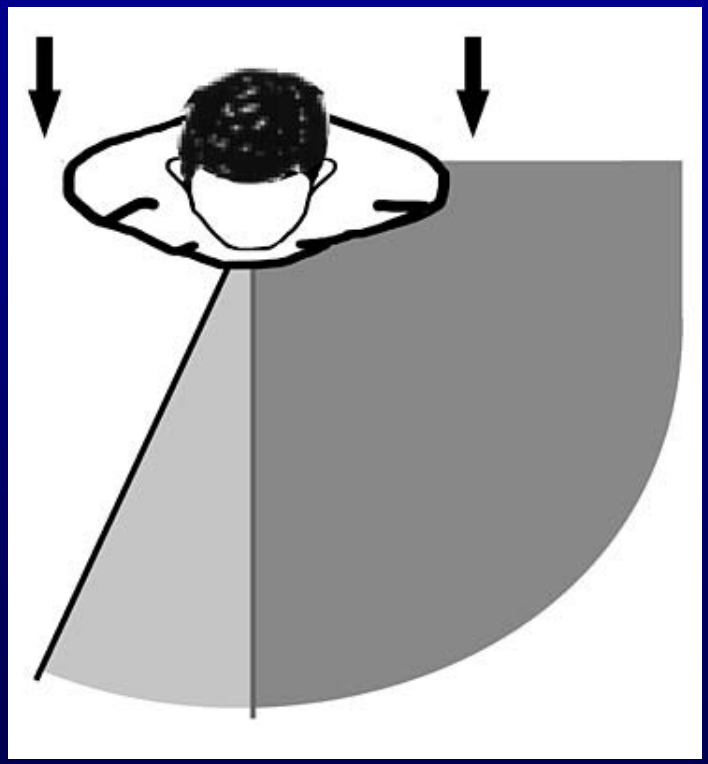
Testing ergonomics at the resource centre, JNK 2008
Condition after removal of a brain tumour in the left occipital area.

Visual field

right eye or left eye fixating



Right eye fixating



Left eye fixating

Visual Ergonomics

11.1.2012 morning

Comparing basic colours

Concept “same”

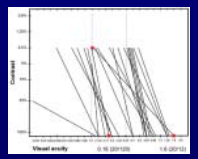
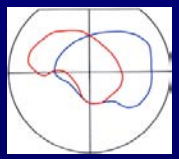
Clinical examinations

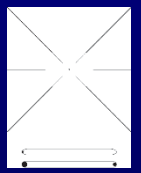
- Ocular motor functions
- Grating acuity
- Recognition acuity, single, line, crowded
- Contrast sensitivity
- Visual field
- Colour vision
- Visual adaptation, filters
- Motion perception



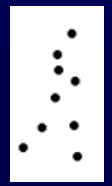








Tests need to be repeated at day care and school -
train the educational personnel to test and observe.

Video sequencies

for training of the personnel
to observe
to repeat test situations
to record with video camera
to analyse sequencies

Right exotropia

Finger on the fixation-object (face). Left eye fixates, right eye moved outward.

Cover test

with hand

Difference in fixation behaviour.

Fiksaatio valoon on hyvin lähellä mustuaisen keskipistettä.

Fixation at penlight varies

Exentric fixation at detail

LEA Puzzle

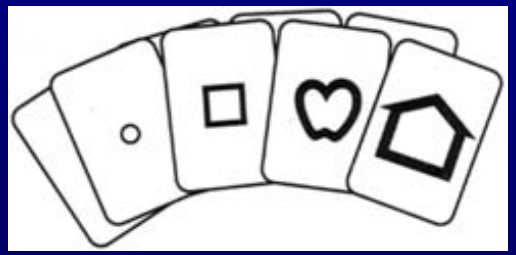
B&W side

Correct direction is not yet important.

Difference between tight and wide picture

Best recording would be using tight near picture from below and straight on the face.

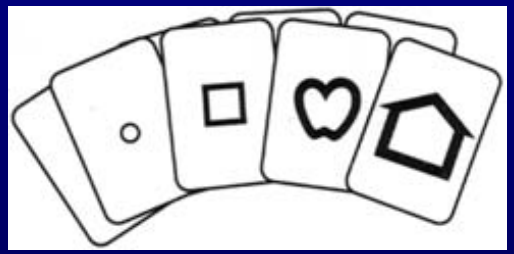
LEA Playing cards, big pictures



Visus = m/M

LEA Playing cards, small

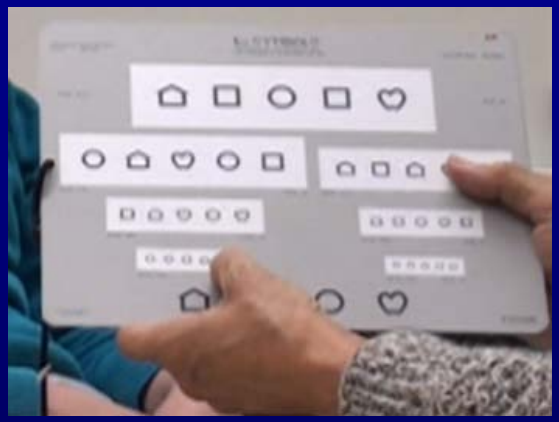
Visual acuity:
distance m/M-size



0.4 m/ 2.5 M =
4/25= 16/100= 0.16

Screening near test

dificult, 1/3 of the value with single symbols



Tuloksen näyttäminen viereisessä huoneessa oleville ja kameralle: 2.5M kuviot (0.16) nähtiin yksittäisillä kuvioilla. Seulontalähitesti, rivitesti oli selvästi vaikeampi kuin yksittäiset kuviot: 0.05 - rivi osittain oikein.

Low contrast Heidi test

Test is in upper right corner.

3 month old baby

Low contrast Heidi test

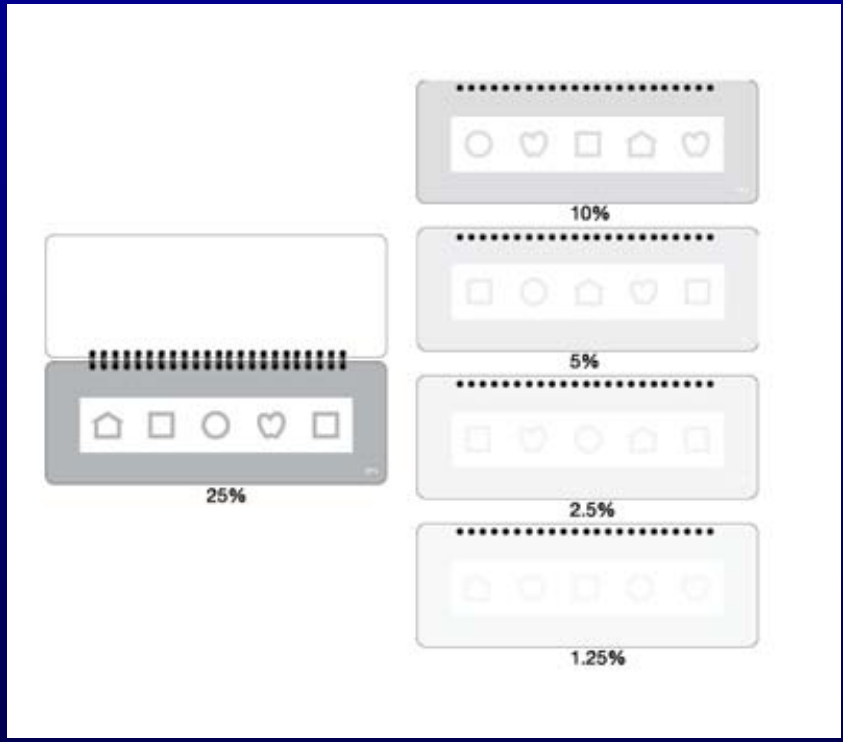
2.5% contrast at a distance slightly more than a metre is good.
Enough for communication at close distances.

Too large a picture

The camera should not be on other persons, except when specifically planned. If the frames are cut, image quality decreases. Compare with the next slide.

10M low contrast test

24%, 10%, 5%, 2.5% and 1.25%:n test lnes



If only a part of the video frames is used, image quality is poor but the functions can be recognized. Compare with the previous picture.

Accommodation

In this situation no change toward minus

Teachers, therapists and doctors had seen the testing through an one-way mirror.

Pupil reaction

When the object with interesting details comes closer, the eyes normally converge, Pupils become smaller and the eyes accommodate. None of these functions was Clearly present this time. Pupil became a little smaller a few times.

Better? A difficult question

Short observation distance

geometric magnification

Training the moving along the lines

Movement along the broad (1 cpcm) lines good. The (4 cpcm) lines difficult. Training with straight and different non-straight lines at school.

Waggoner

värinäön seulontatesti

Waggonerin screening test for red-green deficiency is a low contrast test. This ”Color Vision Testing made easy”uses easy pictures but at low contrast.

Examples on positioning and facilitation

Limited positions

Facilitation

Test caps in a row

Facilitation

Tea

”Nearly blind”

Crying as communication

RE: phtisis, no pressure
LE: buphthalmous, lateral iridectomia, cataract

Following movements

test stimulus in the hand of the child

Hole in iris

peripheral iridectomy

Fixation and visual field

Tactile stimulation

Vibrantion is pleasant, it relaces and
Increases awareness of the structure and functions of the body.
Light increases chid’s activity and learning.

Visual field for flicker at 10 Hz

Only one reaction ön the left side.

Toy as an activator

Notice shifting between visual and auditory dominance

Visual information is supported with tactile information and the movements of the hand.

From crying -> to curious

The less there is vision the better we should help the child to use it BUT at the same time training of strategies of the blind children.

Severe teraplegic condition

First assessment in Nov. 2011. Movemnts in right wrist disappeared during scoliosis operation. Right arm can be lifted to activate switches. Tactile information in hands is good and enjoyable, Chinese meditation balls were fun, several other balls as well.

Fixation target in child's hand

Difficult to shift attention across midline, own favourite toy.

Chinese meditation ball

Masage ball

+4 lenses and Gogo doll

Presentation of large symbols (LH)

Presentation of large symbols (NN)