Clinical evaluation of video imaging technology during visual field exams

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Financial disclosure

J. Charlier, CEO of Metrovision

Patent pending PCT/EP/2015/059428

Lille - chamber of commerce

Time line of perimetry technology

Early developments
discovery of semiology

Landolt
Paris ~1900

Standardization
of stimulation

Goldmann,
Bern ~1940

Automation

?

Limits of automated perimeters

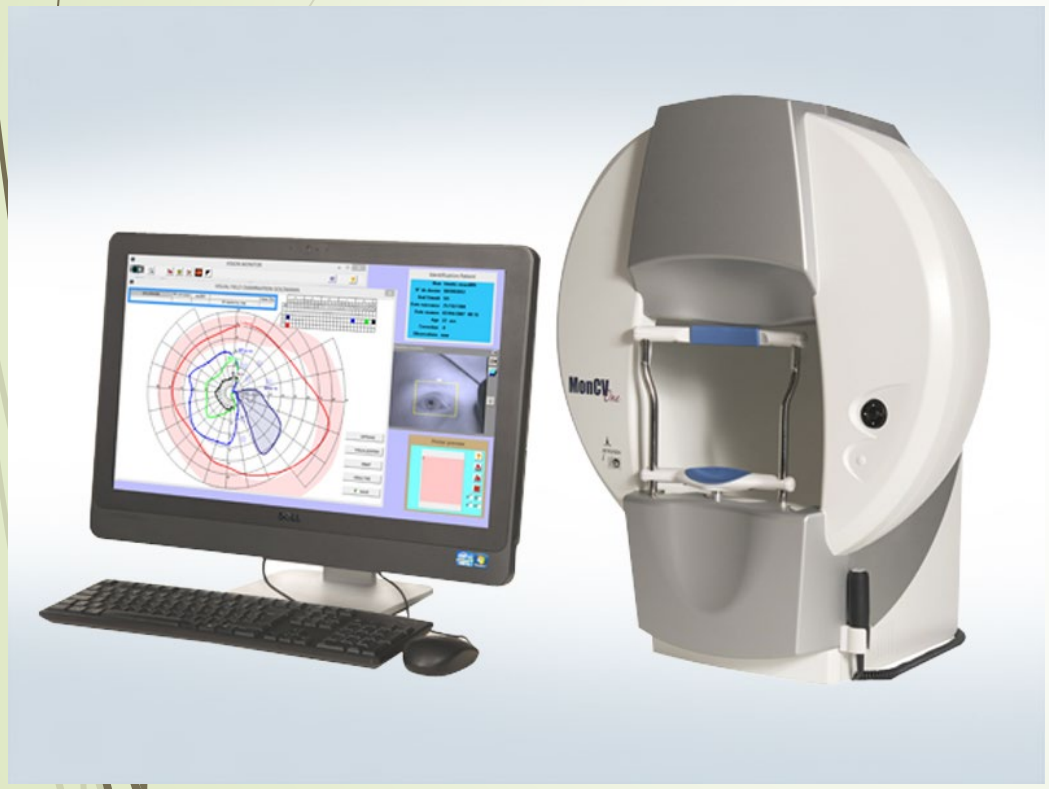
- Young age
- Old age
- Low vision
- Cognitive handicap
- Assessment of ocular motility
- Assessment of binocular functions (diplopia field)

Publications referring to perimetry test

source: PUBMED

	Goldmann perimeter	Automated perimeters
Last 5 years	1017	~1350

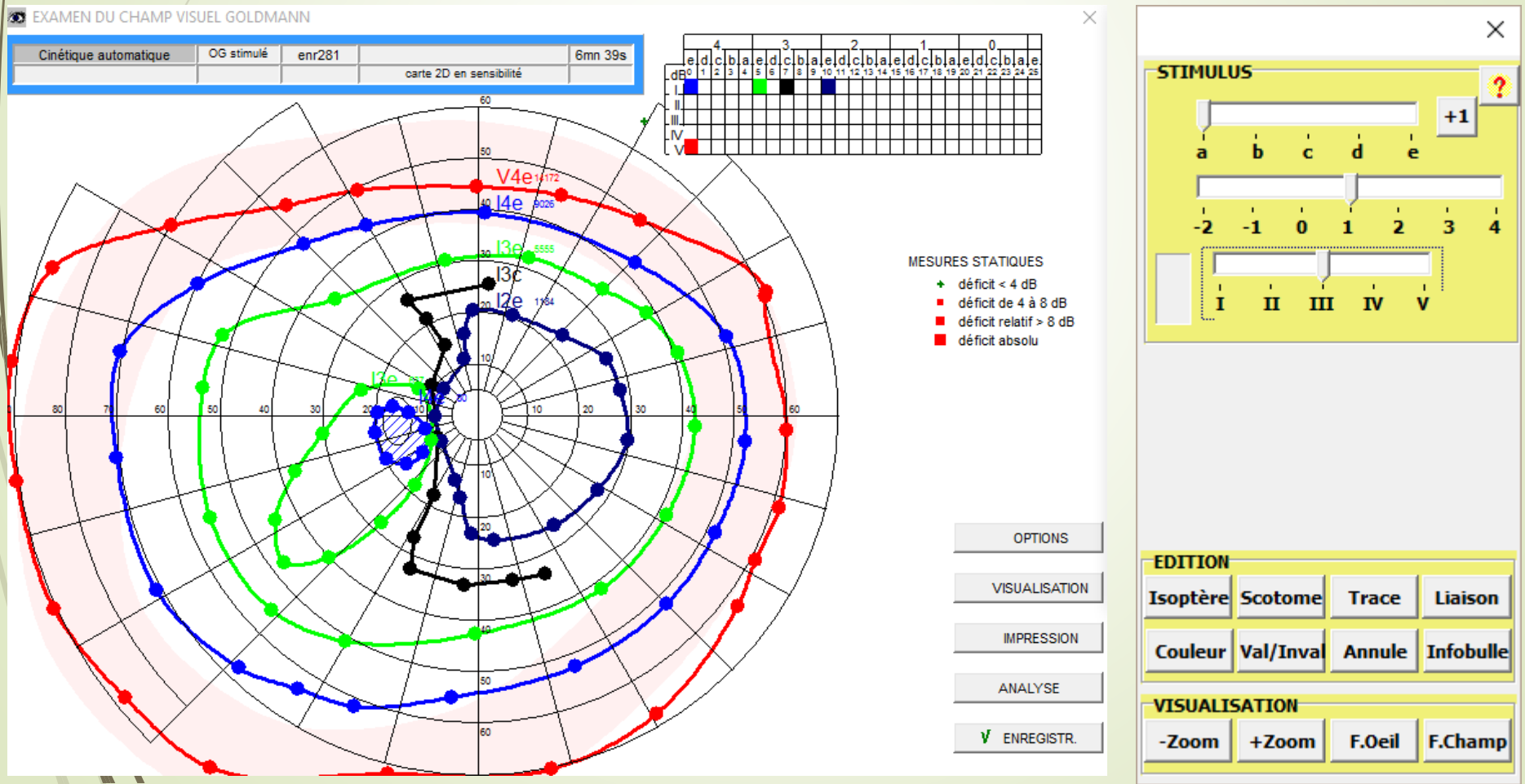
MonCvONE perimeter



- Interactive interface
- High resolution video sensor
- High quality video compression
- Projection perimetry
- LED technology
- Full field (up to 100 degrees)

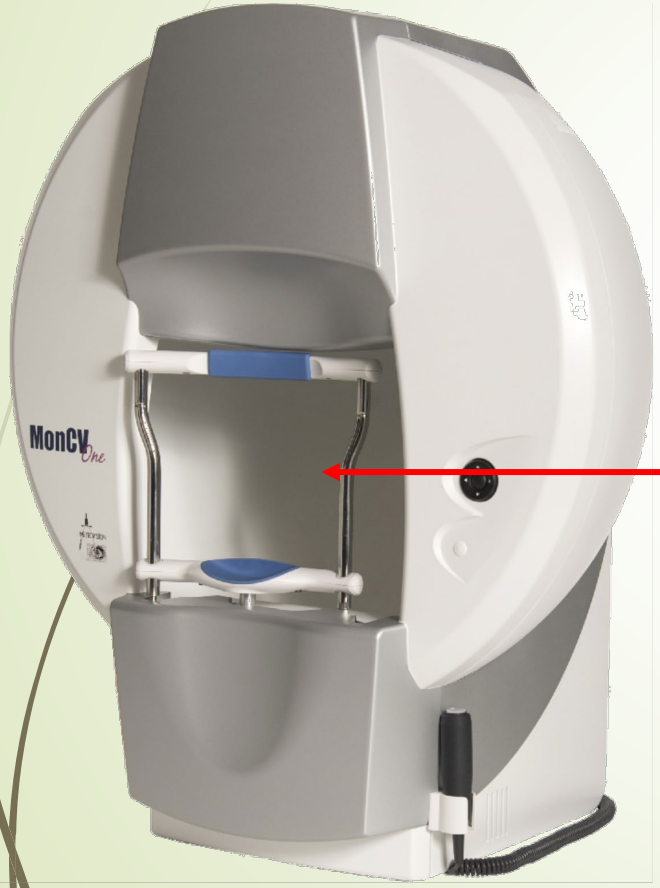
Video imaging: interface

- Highly interactive mouse interface
- Similar to Goldmann for stimulation
- Faster than Goldmann for operation



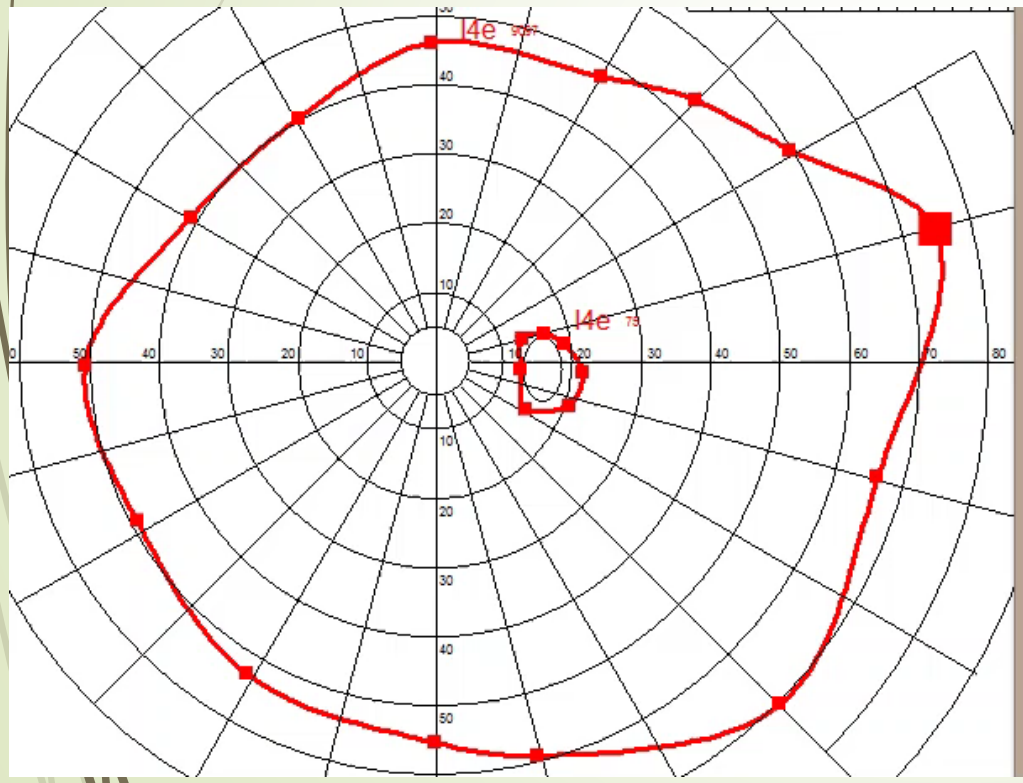
Video imaging: video capture

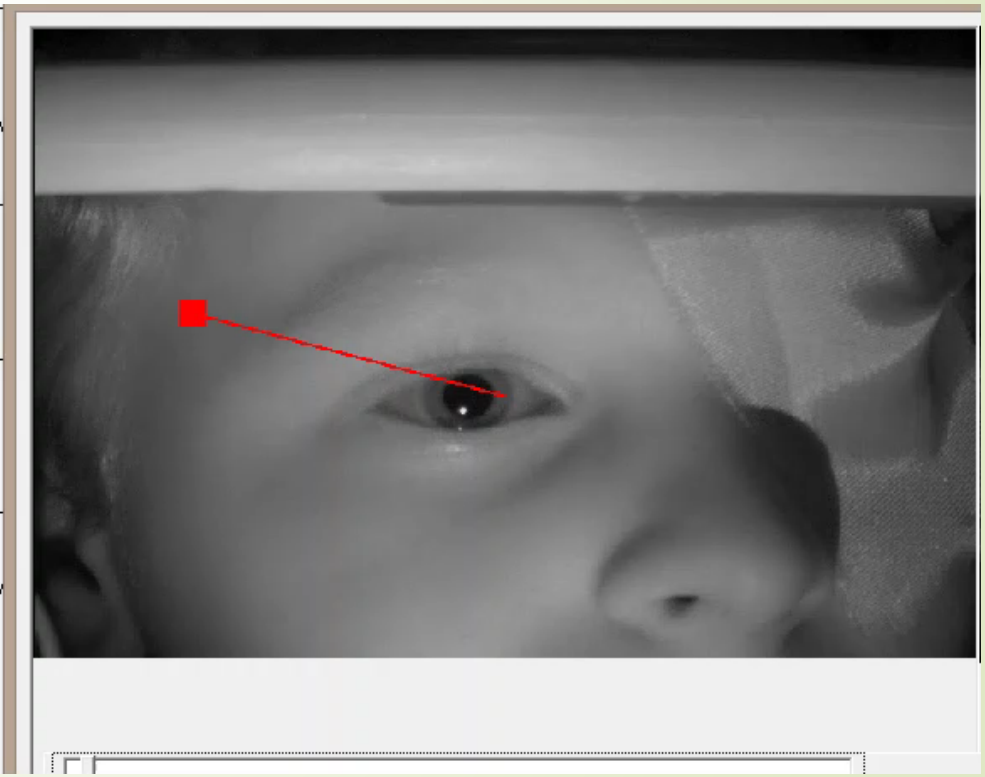
- near infra red camera
- high resolution
- large binocular field of view



Video imaging: video synchronization

- Synchronized video recording
- Compressed video is saved with the exam
- The entire exam can be replayed



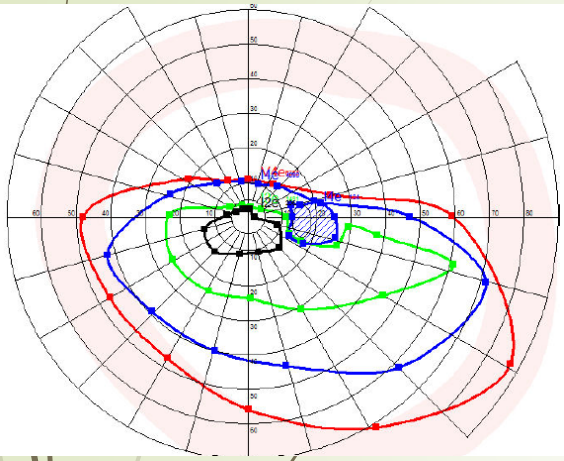


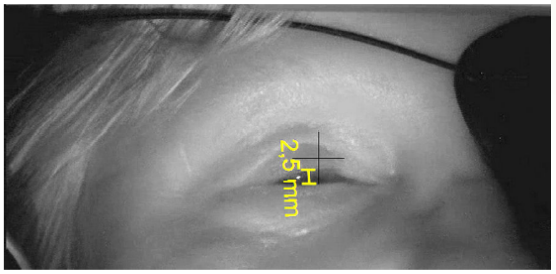
Video imaging: visual field perimetry

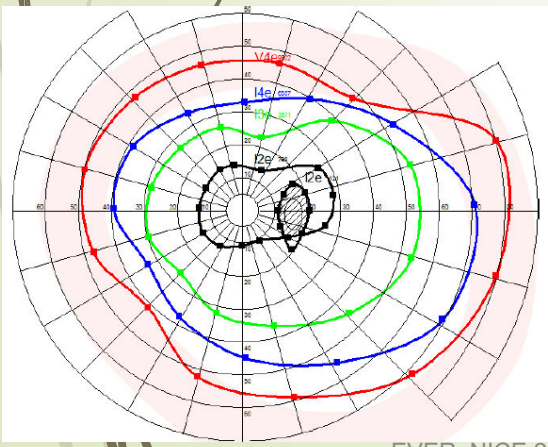
Advantages of video play back in synchrony with the examination:

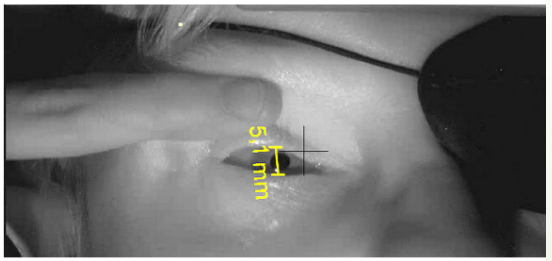
- A snapshot of the video can be included in the examination report
- Useful for the documentation of ptosis, abnormal eye movements, abnormal head posture, position of refractive lens,…

Video imaging: ptosis









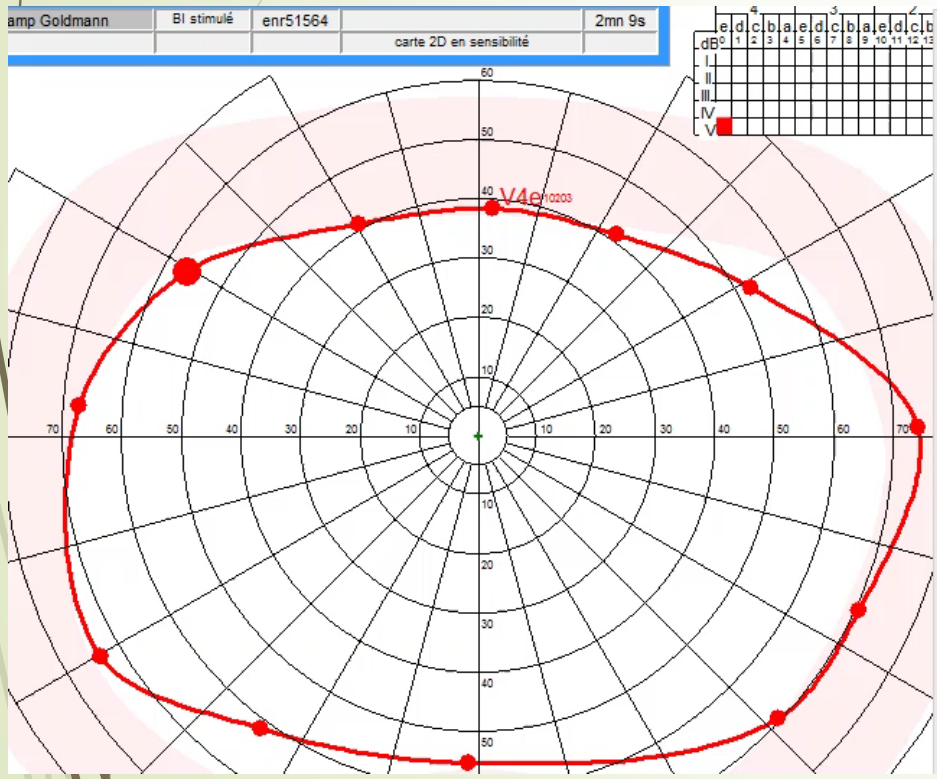
- Evaluate the functional alteration due to ptosis
- Perform one visual field exam
  - measure opening of eye lid
  - measure upward limit of visual field
- Repeat the procedure with eye lid maintained

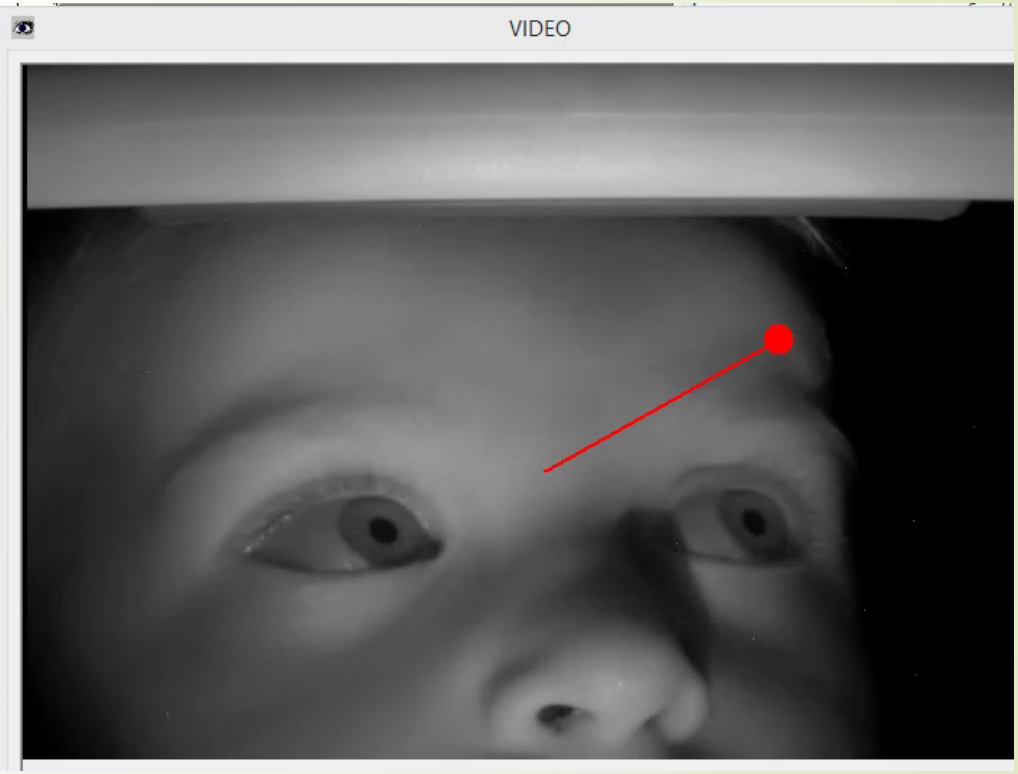
Video imaging: attraction perimetry

- **Attraction perimetry** uses the eye movement response to the presentation of visual stimulation
- Useful to test visual field in patients who cannot cooperate (below the age of 6 years, with handicap, …)
- Stimulus is first presented at the center of the field until the subject is fixating
- Then stimulus is then presented in the periphery. The eye movement response or absence of response is recorded by the operator

Video imaging: attraction perimetry

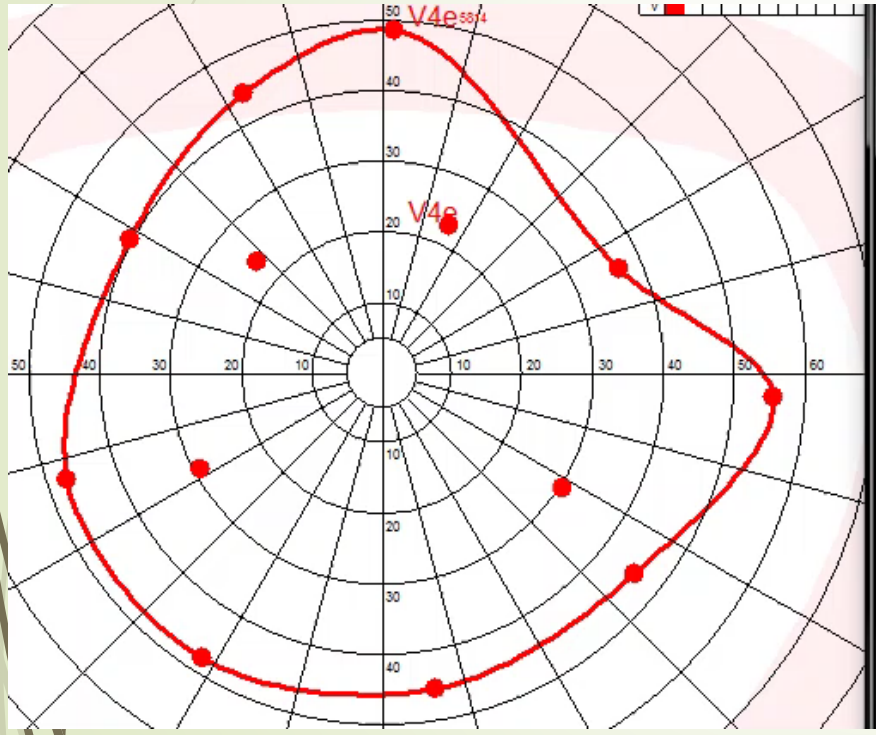
- Johan, 3 years old
- Suspicion of albinism

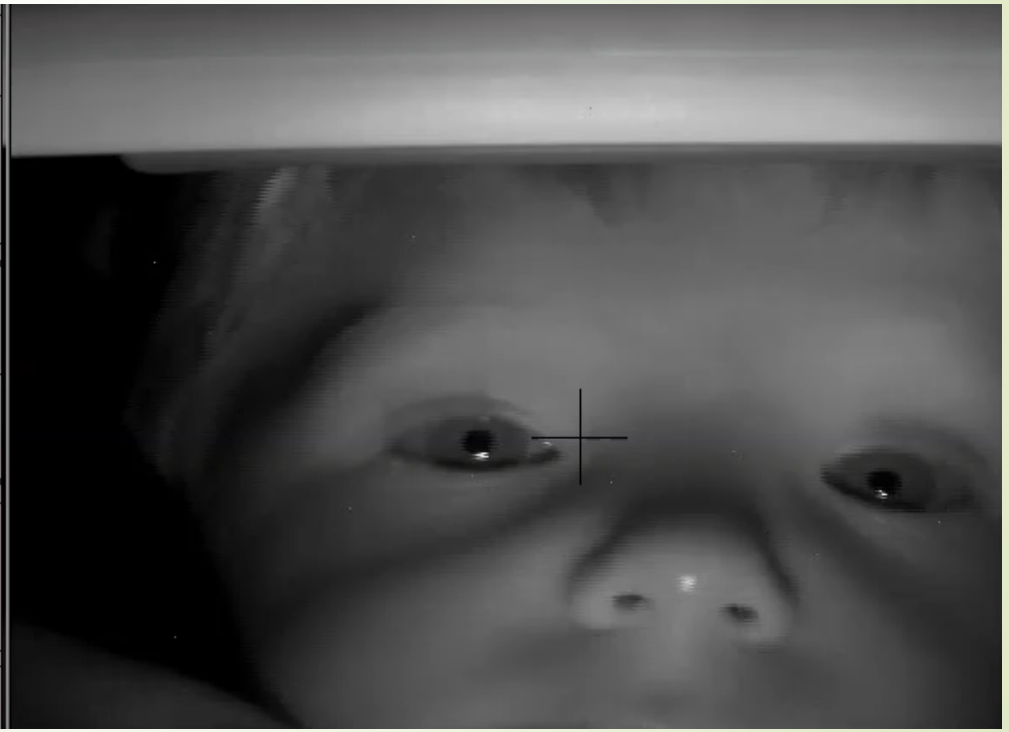




Video imaging: attraction perimetry (2)

- Noah, 2 years old
- Hemiparesis, delayed development



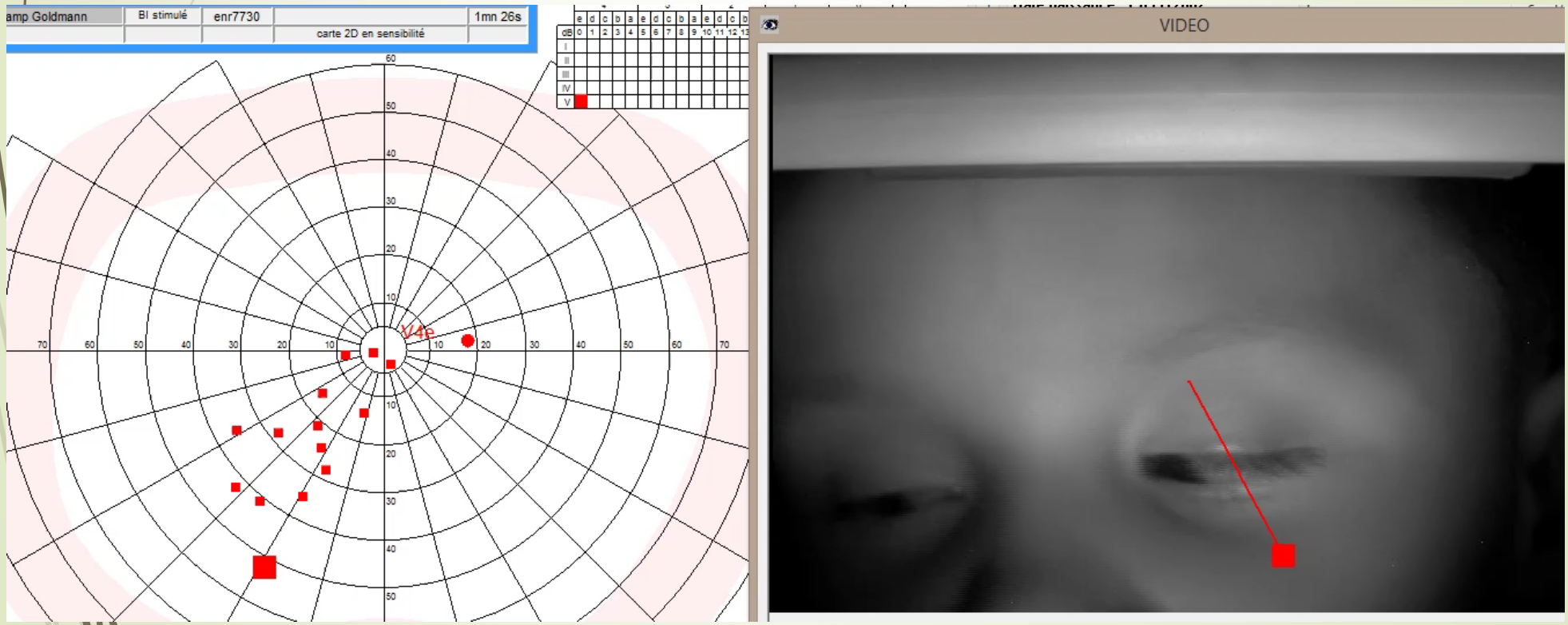


Video imaging: useful field of vision

- The **useful field of vision** is the area of space that a subject can use for every day tasks
- No fixation requirement
- Subject presses the response button when stimulus is perceived
- Useful for low vision rehabilitation

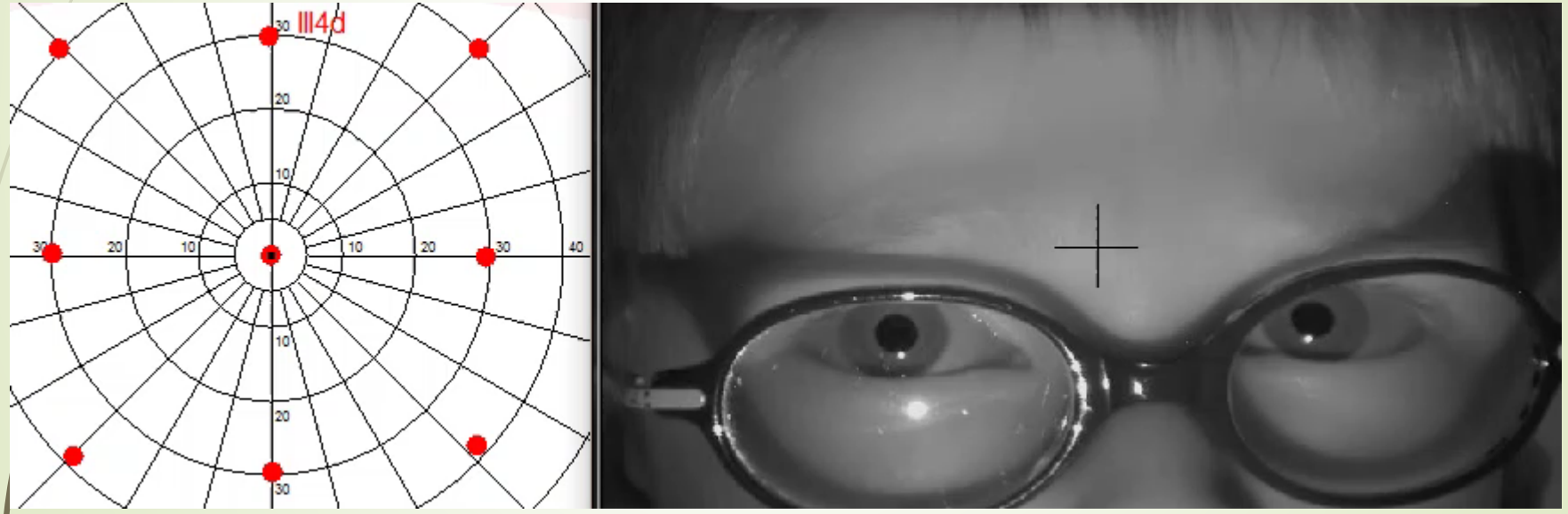
Video imaging: useful field of vision

- Mathis, 7 years old
- Glioma with only peripheral vision



Video imaging: ocular motility

- Timeo, 5 years old



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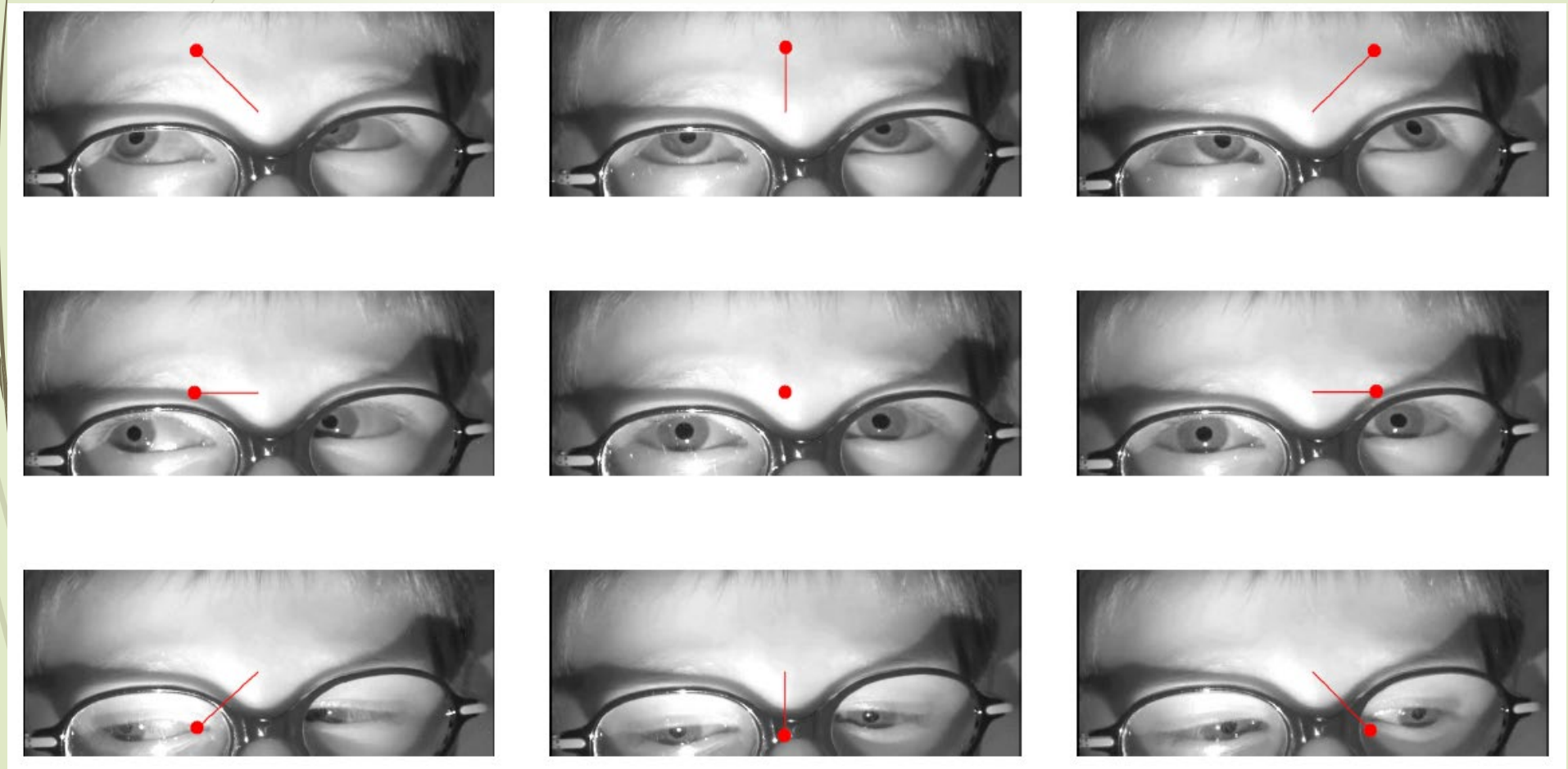
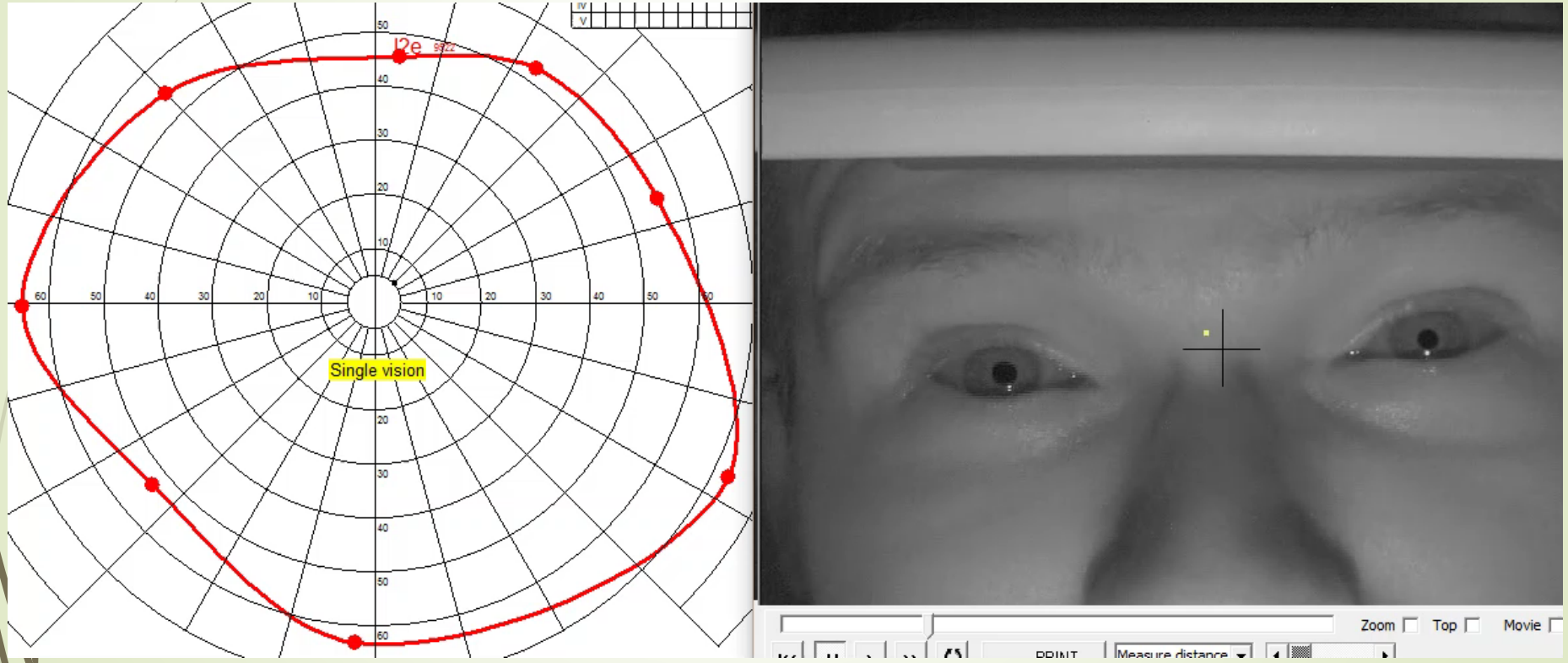


Video imaging: field of fusion



Video imaging perimeter
Clinical applications

- Documentation of artefacts
  - Ptosis
- Perimetry in subjects inapt for Automated Perimetry
  - Perimetry in infants
  - Attention visual field
- Ocular motility
- Binocular vision

Thank you!