Buenos Aires – Noviembre 2014

ACTUALIZACION EN TEMAS DE OFTALMOPEDIATRIA

TECNOLOGIA Y OJOS

María Vanesa Sors


BAJA VISION Y TIFLOTEC NOLOGIA
HRT - OCT
AMBLIOPIA Y GAFAS ELECTRONI CAS
SINDROME VISUAL INFORMATICO

SINDROME VISUAL INFORMATICO *(SVI)*

Computer Vision Syndrome (CVS)

afección temporal

enfocar los ojos en pantalla de computadora durante períodos prolongados e ininterrumpidos de tiempo

SINDROME VISUAL INFORMATICO *(SVI)*

De acuerdo con el *Instituto Nacional de Salud e Higiene Ocupacional*, el Síndrome Visual Informático afecta a cerca el **90%** de las personas que pasan **más de tres horas** al día frente a una computadora

WSPOS

CHILDREN

80% SAY

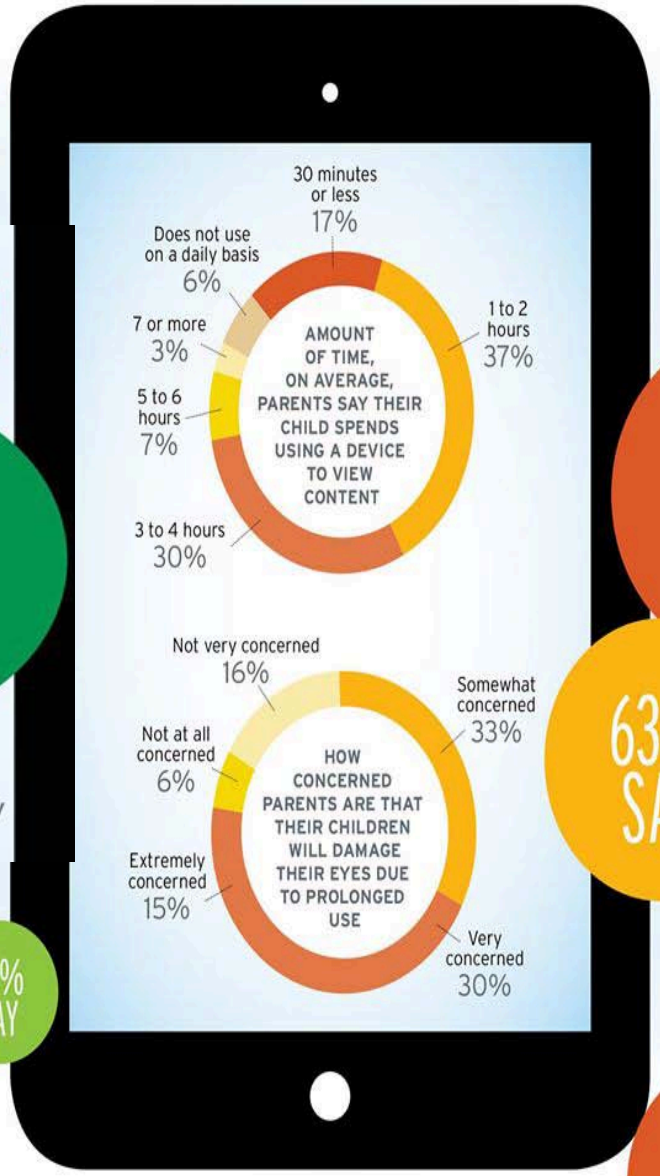
their eyes burned, itched, felt tired or blurry after using a device

32% SAY

they take breaks from looking at screens every hour

18% SAY

they use their devices for 7 or more hours each day



PARENTS

73% SAY

their child uses a computer/ tablet on a daily basis

63% SAY

their child uses a computer/ tablet to study/do homework

55% SAY

their child has his or her own smartphone/tablet

American Optometric Association

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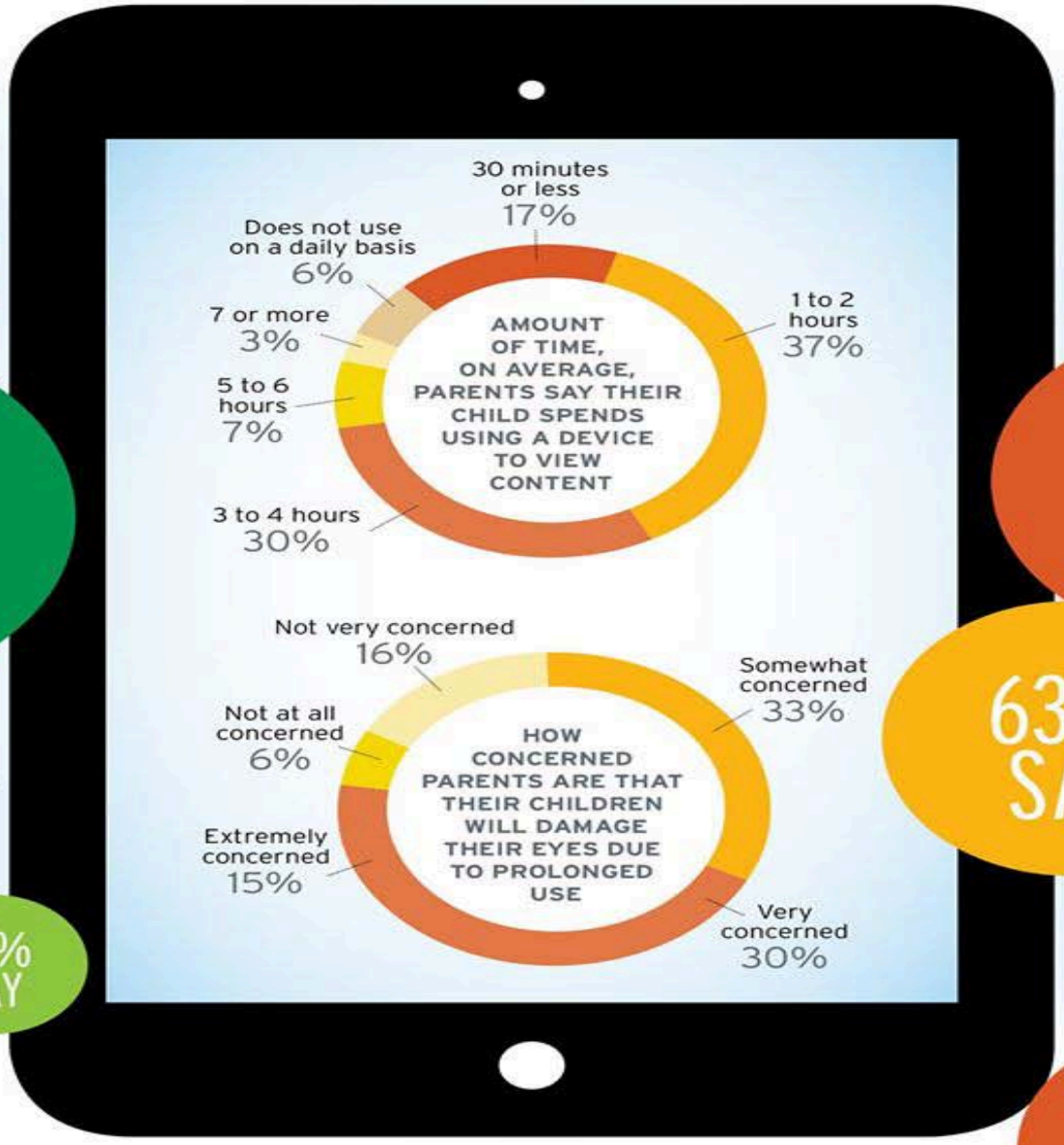

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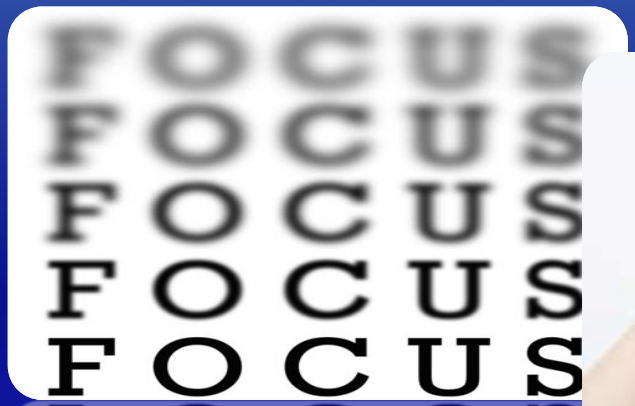
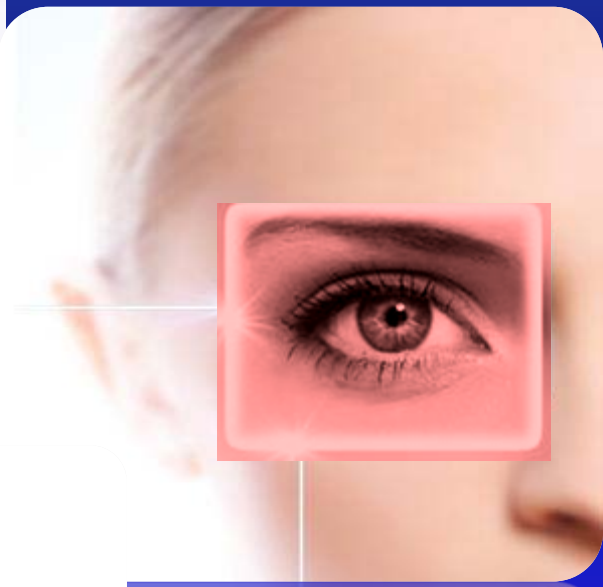
American Optometric Association®

SINDROME VISUAL INFORMATICO *(SVI)*



Visión borrosa

Fatiga ocular (astenopia)



Irritacion ocular

Ojo seco

Dolores de cabeza , cuello, hombro y espalda

SINDROME VISUAL INFORMATICO *(SVI)*

Fisiopatogenia del Ojo seco

↓ Frecuencia-Amplitud-Calidad PARPADEO

↓

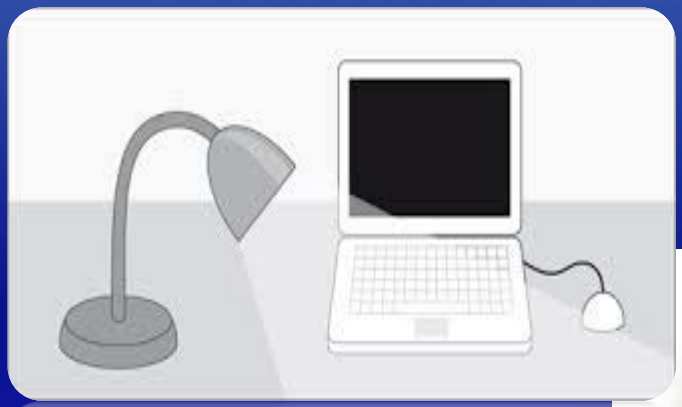
Inestabilidad Film Lagrimal

↓

↑ evaporacion

Bhargava R, Kumar P, Kaur A, Kumar M, Mishra A. The diagnostic value and accuracy of conjunctival impression cytology, dry eye symptomatology, and routine tear function tests in computer users. J Lab Physicians 2014;6:102-8

SINDROME VISUAL INFORMATICO *(SVI)*



Agravadas por condiciones de **iluminación inapropiadas** (deslumbramiento o luz intensa brillante)

Usuarios de **LC**

Flujo de aire en movimiento más allá de los ojos (por ejemplo, rejillas de ventilación, o el **aire directo** de un ventilador)

SINDROME VISUAL INFORMATICO *(SVI)*

INTERFERIR CON OTRAS ACTIVIDADES

SEDENTARISMO Y OBESIDAD

SINDROME VISUAL INFORMATICO *(SVI)*

RECOMIENDA...

Ojos cerrados por 20 segundos, al menos cada 30 min .

parpadear conscientemente de vez en cuando (esto ayuda a cubrir el ojo de una capa lagrimal)

SINDROME VISUAL INFORMATICO *(SVI)*

SE RECOMIENDA...

"regla 20-20-20"

DAÑO VISUAL POR LA COMPUTADORA

Después de fijar la vista en un monitor durante horas ¿Ha sentido ardor en los ojos o visión borrosa? Podría padecer Síndrome Visual Informático (SVI). Conozca diez maneras de combatirlo.

¿Cómo evitarlo?

LA CAUSA
Utilizar un monitor de computadora durante horas.

LO QUE PROVOCA

- Dolor o irritación en los ojos
- Ojos secos o llorosos
- Visión borrosa o doble
- Sensibilidad a la luz
- Dificultad para enfocar las imágenes
- Dolor en el cuello o cabeza
- Combinación de todos los anteriores

Distancia ojo-monitor de 50-70 cm

Evitar brillo excesivo

Pantallas LCD con antireflex

Pantalla por debajo del nivel de los ojos: 10°-20° inclinacion

SINDROME VISUAL INFORMATICO *(SVI)*

RECOMIENDA…

-Menores de 2 años no usar dispositivos informaticos

- 3-5 años limitar uso a 30-60 minutos/dia

- 6-9 años limitar uso a 60-120 minutos/dia

– Niños mayores mas de 2 horas/dia esta permitido

J Pediatr Ophthalmol Strabismus. 2014 Mar-Apr;51(2):87-92. doi: 10.3928/01913913-20140128-01. Epub 2014 Feb 4.

Association between video display terminal use and dry eye disease in school children.

Moon JH, Lee MY, Moon NJ.

Abstract

PURPOSE:

To evaluate the risk factors of dry eye disease in school children associated with video display terminal use.

METHODS:

Two-hundred eighty-eight children were classified in either a dry eye disease group or control group according to the diagnostic criteria of dry eye disease. The results of ocular examinations, including best-corrected visual acuity, slit-lamp examination, and tear break-up time, were compared between groups. The results of questionnaires concerning video display terminal use and ocular symptoms were also compared.

RESULTS:

Twenty-eight children were included in the dry eye disease group and 260 children were included in the control group. Gender and best-corrected visual acuity were not significantly different between the two groups. Smartphone use was more common in the dry eye disease group (71%) than the control group (50%) (P = .036). The daily duration of smartphone use and total daily duration of video display terminal use were associated with increased risk of dry eye disease (P = .027 and .001, respectively), but the daily duration of computer and television use did not increase the risk of dry eye disease (P = .677 and .052, respectively).

CONCLUSIONS:

The results showed that **smartphone use is an important dry eye disease risk factor in children.** Close observation and caution regarding video display terminal use, especially smartphones, are needed for children.

HIPPOKRATIA
Quarterly Medical Journal ISSN 1108-4189

Hippokratia. 2009 Oct-Dec; 13(4): 230–231.
PMCID: PMC2776336

Impact of computer use on children's vision

N Kozeis

Abstract

Today, millions of children use computers on a daily basis. Extensive viewing of the computer screen can lead to eye discomfort, fatigue, blurred vision and headaches, dry eyes and other symptoms of eyestrain. These symptoms may be caused by poor lighting, glare, an improper work station set-up, vision problems of which the person was not previously aware, or a combination of these factors. **Children can experience many of the same symptoms related to computer use as adults. However, some unique aspects of how children use computers may make them more susceptible than adults to the development of these problems.** In this study, the most common eye symptoms related to computer use in childhood, the possible causes and ways to avoid them are reviewed.

Points to consider for children using a computer

An eye examination. This makes sure that the child can see clearly and comfortably. For regular computer users, at least an annual eye examination is required. When necessary, refractive correction and / or orthoptic exercises (eg. in convergence insuffiency), should be provided.

Reduction of the amount of time that a child can continuously use the computer.

A ten-minute break for every hour work, will minimize the development of accommodative problems and eye irritation.

Carefully check the position of the computer.

The computer monitor and the keyboard are positioned and adjusted according to child's body parameters. The screen should not be positioned in a too high level in the child's field of view; the chair should not be positioned in too low level and the desk not in a too high level. An adjustable chair is a good solution. A foot stool may be necessary to support the child's feet.

Carefully check the lighting for glare on the computer screen.

Windows or other light sources could create glare on the screen. When this occurs, the desk or the computer screen should be turned to another direction.

Reduce the amount of lighting in the room.

In some cases, a dimmer light is preferred instead of the bright overhead light.

TIFLOTECNOLOGIA

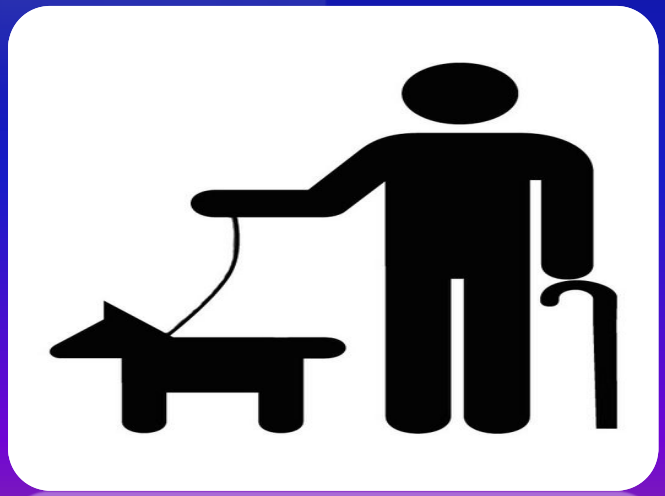
("tiflo" del griego: ciego)

Conjunto de técnicas, conocimientos y recursos encaminados a proveer, a las personas con **discapacidad visual**, los medios oportunos para la correcta utilización de la tecnología.

285 millones de personas con discapacidad visual

Organización Mundial de la Salud

246 millones presentan baja visión.



39 millones son **ciegas**

1,4 millones de niños son ciegos

principales **causas de ceguera** entre los niños son las **cataratas, la retinopatía del prematuro y la carencia de vitamina A**

40-50% patología prevenible o tratable

con pronostico favorable si el diagnostico es precoz

TIFLOTECNOLOGIA

PROGRAMAS INFORMATICOS

Lectores de Pantalla (voz, iconos sonoros, salida braille)

Magnificadores de Pantalla (amplia los caracteres y configura colores dependiendo de la necesidad)

TIFLOTECNOLOGIA

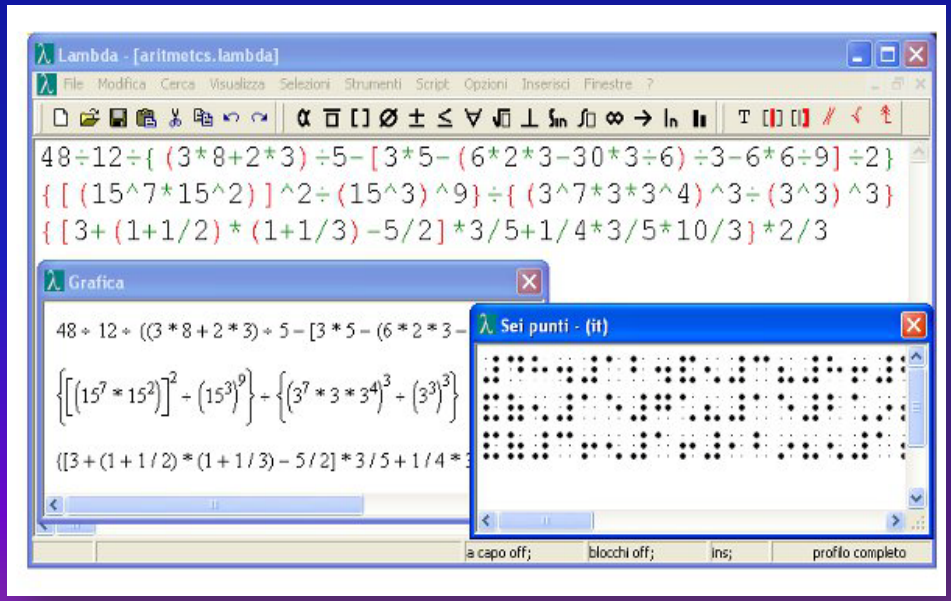
PROGRAMAS INFORMATICOS

Navegadores de internet parlantes

Reconocimiento de textos impresos OCR (*Optical Character Recognition*) **parlantes**

Conversores Braille

Software libre: Calculadora y Aprendizaje de mecanografía



TIFLOTECNOLOGIA

TERMINALES DE LECTURA, TECLADOS E IMPRESORAS BRAILLE (se conectan a la computadora)

ANOTADORES PARLANTES

ANOTADORES ELECTRÓNICOS PARLANTES

Sonobraille

Dispositivos electrónicos con teclado braille para almacenar información y recuperarla mediante voz o braille. Tienen además utilidades de agenda, calendario, calculadora, reloj, etc.

PROGRAMAS PARA INGRESAR INFORMACIÓN A TRAVÉS DE LA VOZ

- Via voice
- Dragon

Requieren entrenamiento, destreza, excelente dicción y aún deben continuar evolucionando

Dispositivos standard que favorecen o posibilitan el acceso

TIFLOTECNOLOGIA

TELEFONOS CELULARES

- Mobile speak. **Lector de pantalla** para teléfonos móviles.

- Mobile magnifier. **Magnificador de pantalla** para teléfonos móviles.

- Mobile speak pocket. Lector de pantallas para PDAs que utilicen Windows Mobile.

- Talks . Lector de pantalla para teléfonos móviles

AUDIOJUEGOS

Víbora 3D es el tradicional juego de la serpiente que se encuentra en la mayoría de los celulares
http://www.tipete.com/userpost/juegos-gratis/audiojuegos-para-chicos-con-deficiencia-visual-y-ceguera-juego-gratis

Ahorcado también un juego tradicional juego de descubrir la palabra oculta.
http://cidat.once.es/home.cfm?id=59&nivel=2

TALLER DE TIFLOTECNOLOGÍA

Lic. Patricia López

Lic. Ana María Mûller

-se trabaja con niños y adolescentes con baja visión o ceguera

-evaluación oftalmológica y funcional

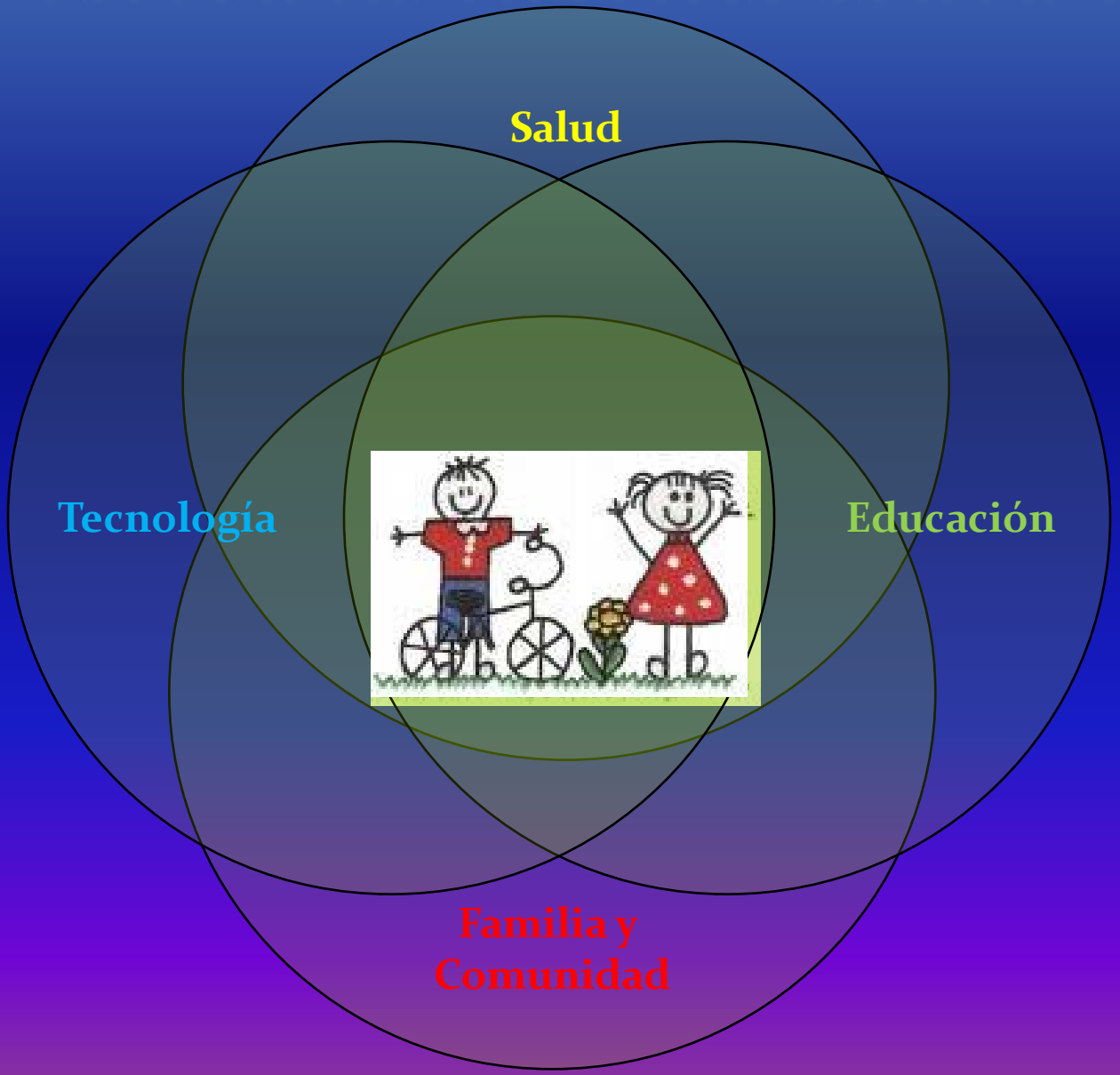
-sugiere el uso de recursos tiflotecnológicos

-acceso a la lecto-escritura

-configura el equipamiento de los niños o se entregan los recursos de software

- **asesoramiento a la familia** para posibilitar la instalación y el acompañamiento durante el uso en el hogar

TALLER DE TIFLOTECNOLOGÍA

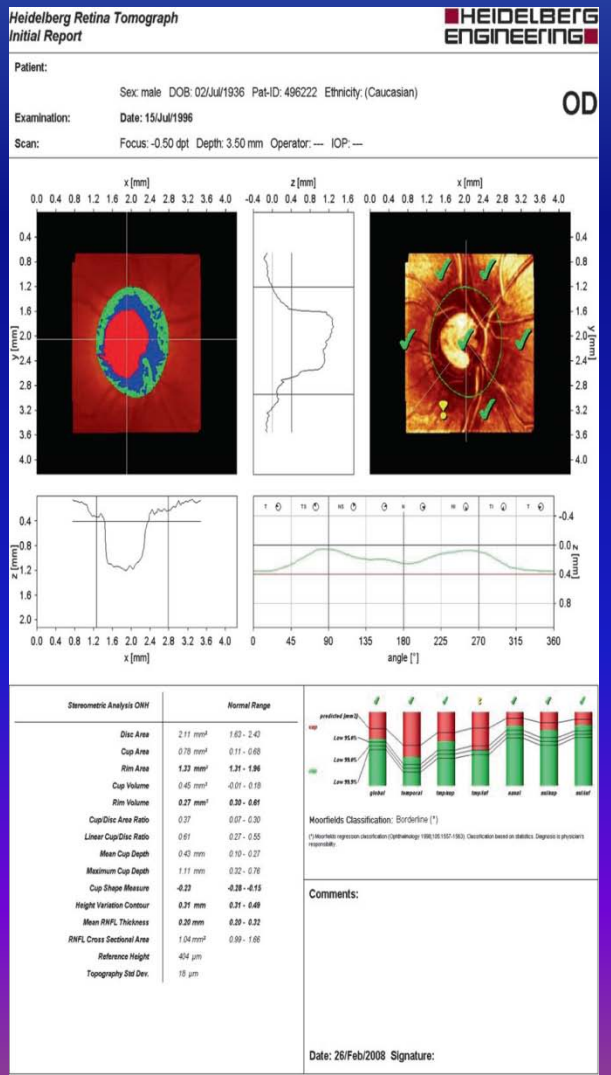


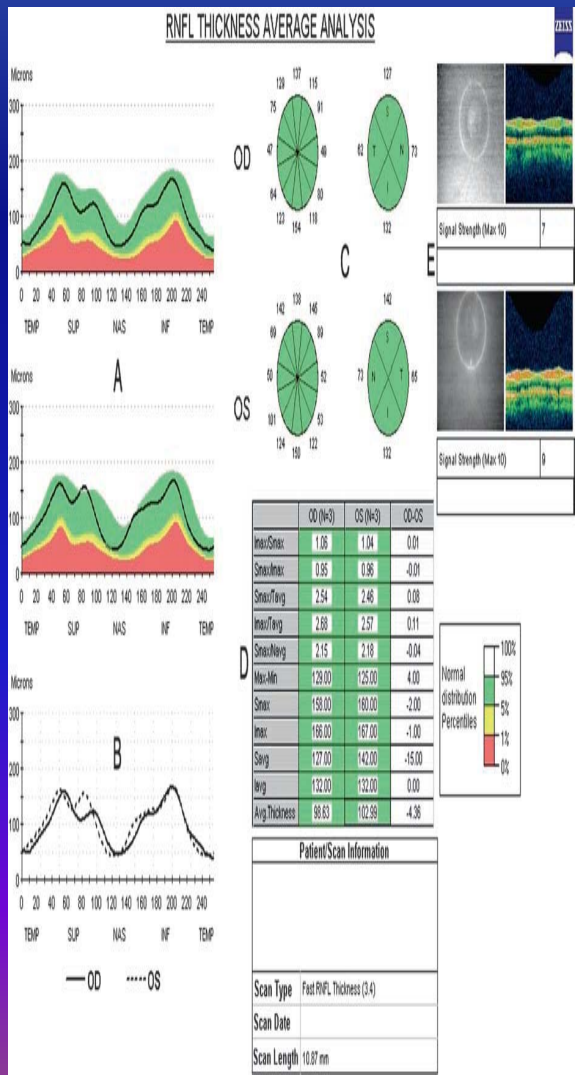
ESTUDIOS COMPLEMENTARIOS
HRT - OCT

Posibilidad de evaluación objetiva del **disco óptico, capa de fibras nerviosas, retina y macula**

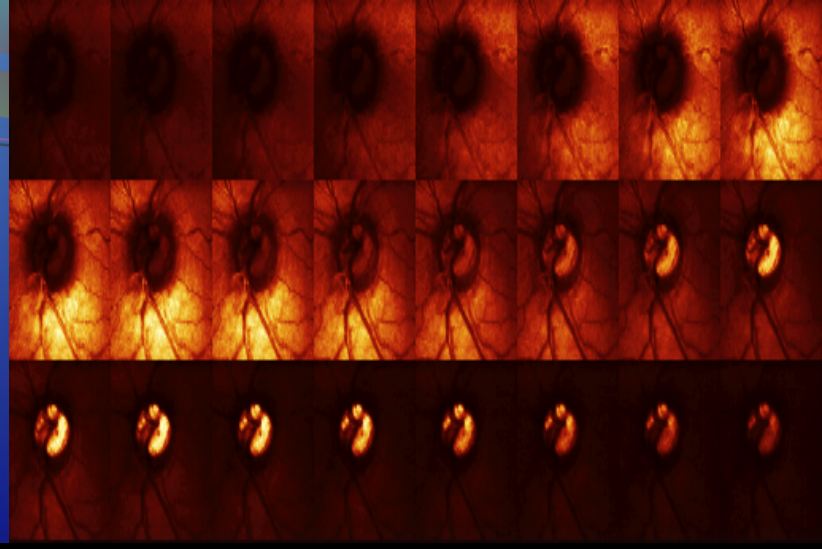
Alta resolución

Alta reproductibilidad

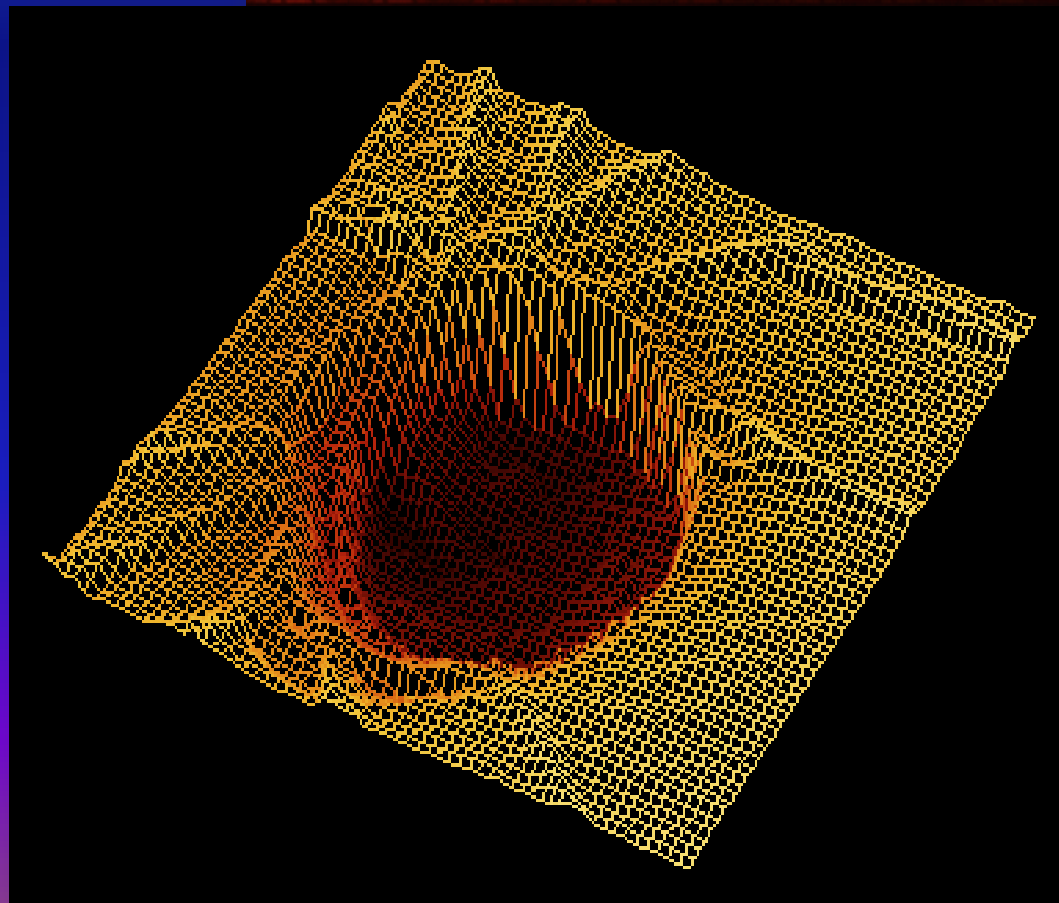




Secuencia de barrido de la superficie retinal en multiples planos focales



Construcción de una imagen tridimensional



Acceso cuantitativo de la topografía retiniana y del disco óptico

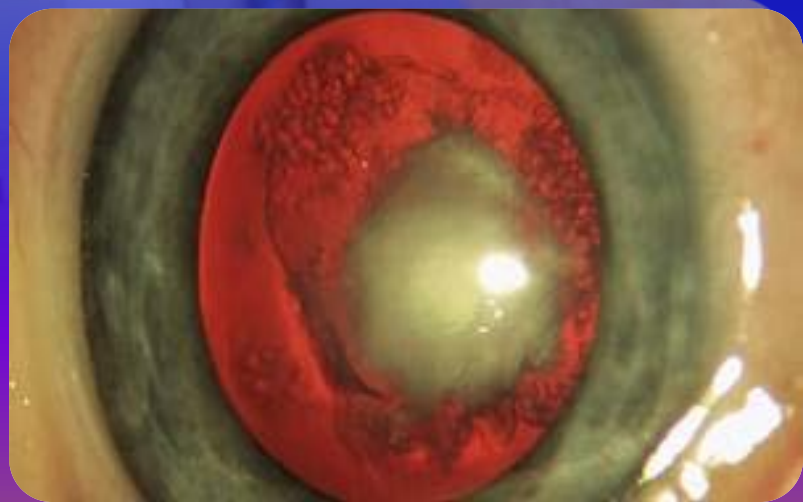
HRT/OCT

VENTAJAS

- No invasivo (util en niños)

DESVENTAJAS

- Opacidad de medios
- Operador dependiente



HRT/OCT

¿Cuándo usarlos?

.Dificultades en el **DIAGNÓSTICO**

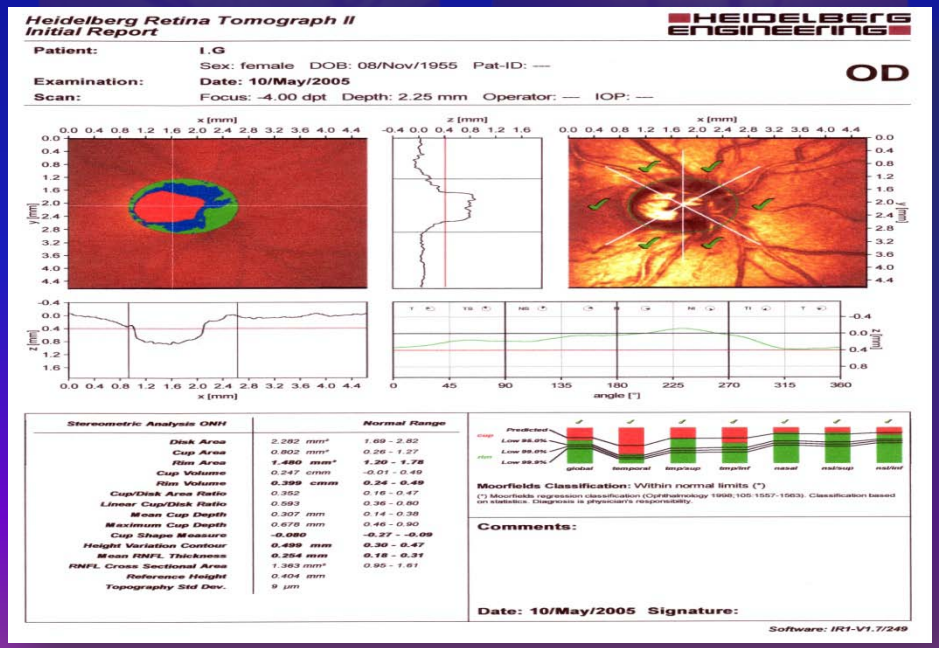
.CVC no confiable

.**SEGUIMIENTO / PROGRESIÓN**

HRT/OCT ¿Cuándo usarlos?

Sospecha de Glaucoma por el aspecto de Papila Optica, diagnostico y seguimiento

Una gran excavación en el contexto de un disco óptico grande **puede ser normal**, mientras que **una pequeña excavación** en un disco óptico pequeño **puede ser indicativa de daño glaucomatoso**.
(Caprioli / Jonas et al)


Heidelberg Retina Tomograph II
Initial Report

HEIDELBERG ENGINEERING

Patient: I.G
Sex: female DOB: 08/Nov/1955 Pat-ID: —
Examination: Date: 10/May/2005
Scan: Focus: -4.00 dpt Depth: 2.25 mm Operator: — IOP: —

OD

Stereometric Analysis ONH		Normal Range
Disk Area	2.282 mm²	1.69 - 2.82
Cup Area	0.802 mm²	0.26 - 1.27
Rim Area	**1.480 mm²**	**1.20 - 1.78**
Cup Volume	0.247 cmm	-0.01 - 0.49
Rim Volume	**0.399 cmm**	**0.24 - 0.49**
Cup/Disk Area Ratio	0.352	0.16 - 0.47
Linear Cup/Disk Ratio	0.593	0.36 - 0.80
Mean Cup Depth	0.307 mm	0.14 - 0.38
Maximum Cup Depth	0.678 mm	0.46 - 0.90
Cup Shape Measure	**-0.080**	**-0.27 - -0.09**
Height Variation Contour	**0.499 mm**	**0.30 - 0.47**
Mean RNFL Thickness	**0.254 mm**	**0.18 - 0.31**
RNFL Cross Sectional Area	1.363 mm²	0.95 - 1.61
Reference Height	0.404 mm	
Topography Std Dev.	9 µm	

Moorfields Classification: Within normal limits (*)
(*) Moorfields regression classification (Ophthalmology 1998;105:1557-1563). Classification based on statistics. Diagnosis is physician's responsibility.

Comments:

Date: 10/May/2005 Signature:

Software: IR1-V1.7/249

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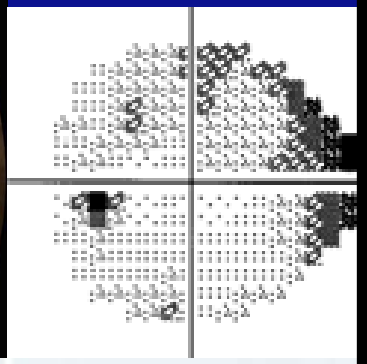
Glaucoma Juvenil : Seguimiento con OCT

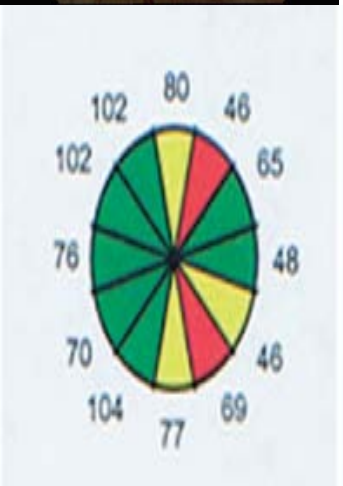
AÑO 2002

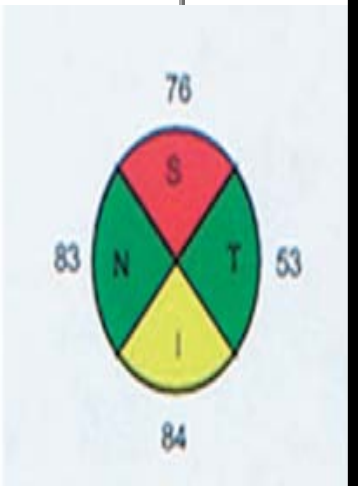
Varón, 15 años

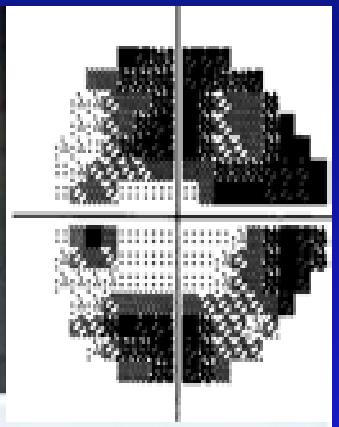
TO: OD 25 mmHg

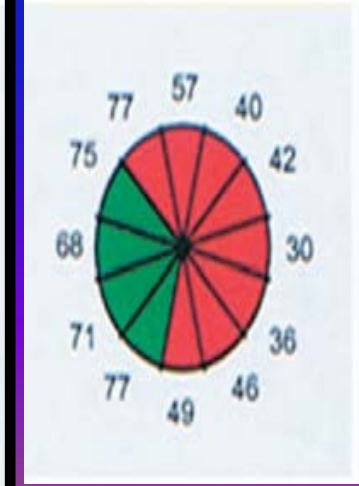
OI 28 mmHg

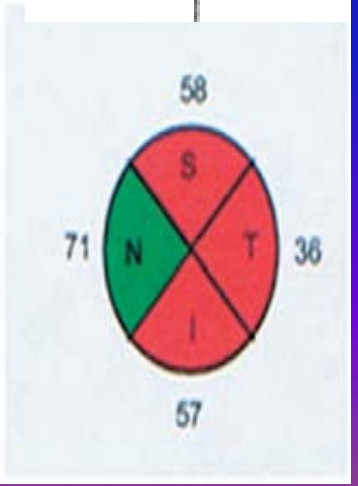








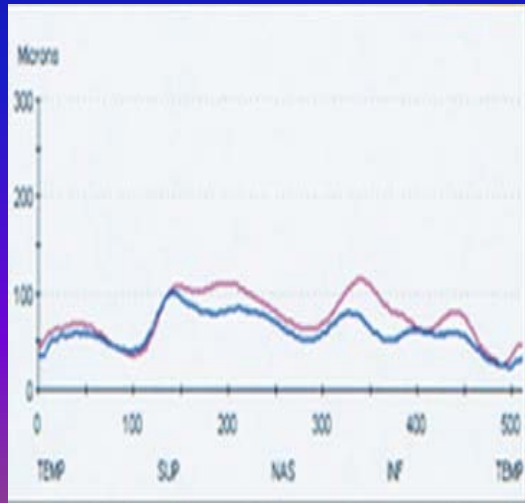




AÑO 2006

TO: OD 25 mmHg

OI 32 mmHg

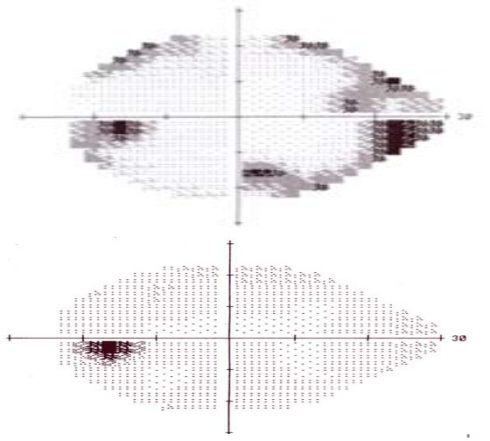


HRT/OCT ¿Cuándo usarlos?

Megalopapila

Niño 6 años
Control
OD 10/10 sc
OI 10/10 sc
FO: OD normal
OI Megalopapila

TO: 11 AO
Paqui: 540 / 550
Ex.Neurolog.Normal



Stereometric Analysis Disk

Disk Area:	3.238 mm²
Cup Area:	1.625 mm²
Cup/Disk Area Ratio:	0.502
Rim Area:	1.613 mm²
Cup Volume:	0.714 cmm
Rim Volume:	0.188 cmm
Mean Cup Depth:	0.389 mm
Maximum Cup Depth:	0.792 mm

Stereometric Analysis Disk

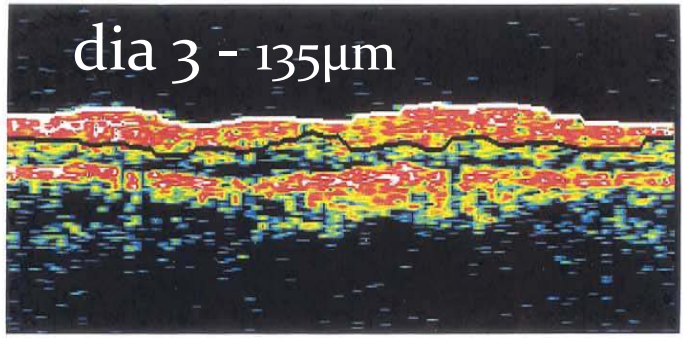
Cup Shape Measure:	-0.041
Height Variation Contour:	0.146 mm
Mean RNFL Thickness:	0.099 mm
RNFL Cross Section Area:	0.631 mm²
Reference Height: (Std)	0.130 mm

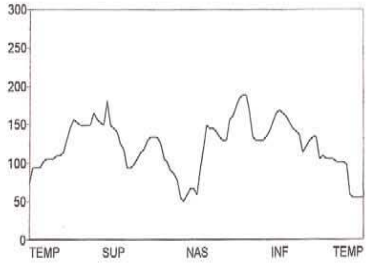
Neuropatia Optica Traumática

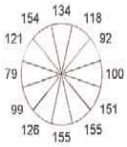
.Varón 14 años, accidente de moto

.OD V.luz / DPAR

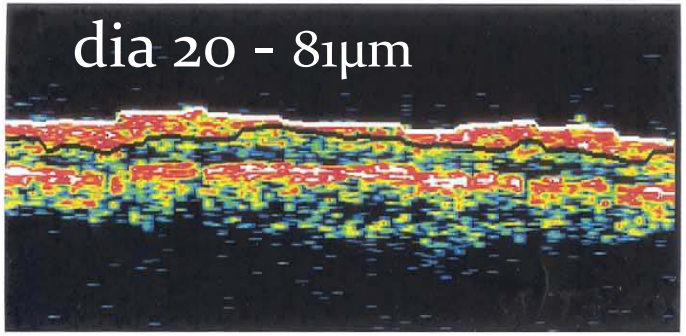
A

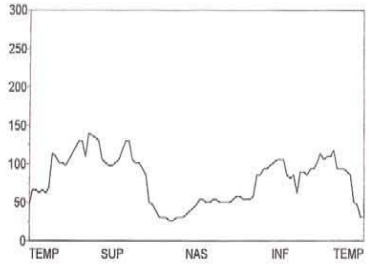


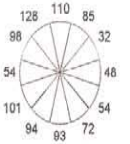




B







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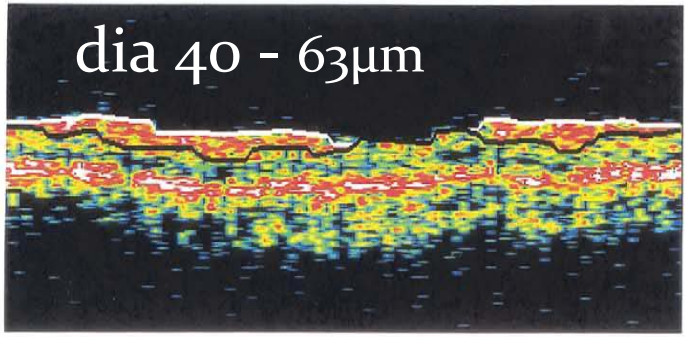

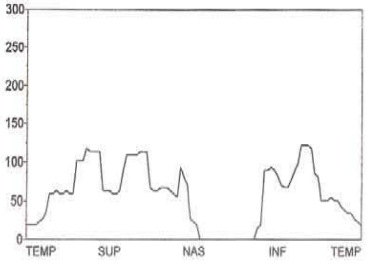

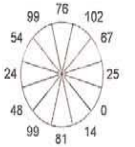

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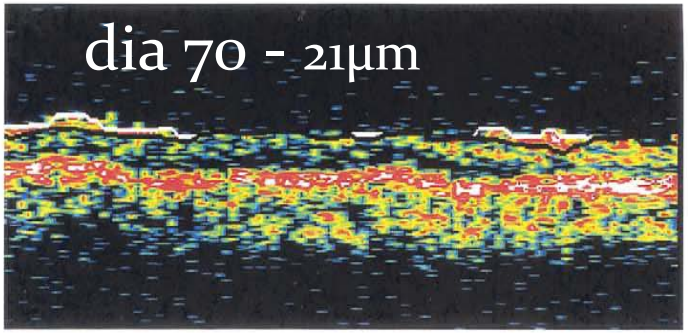
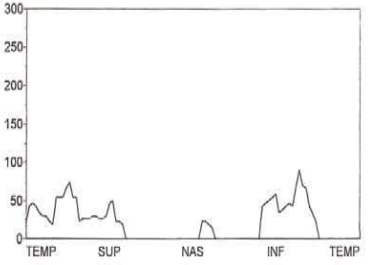
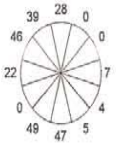




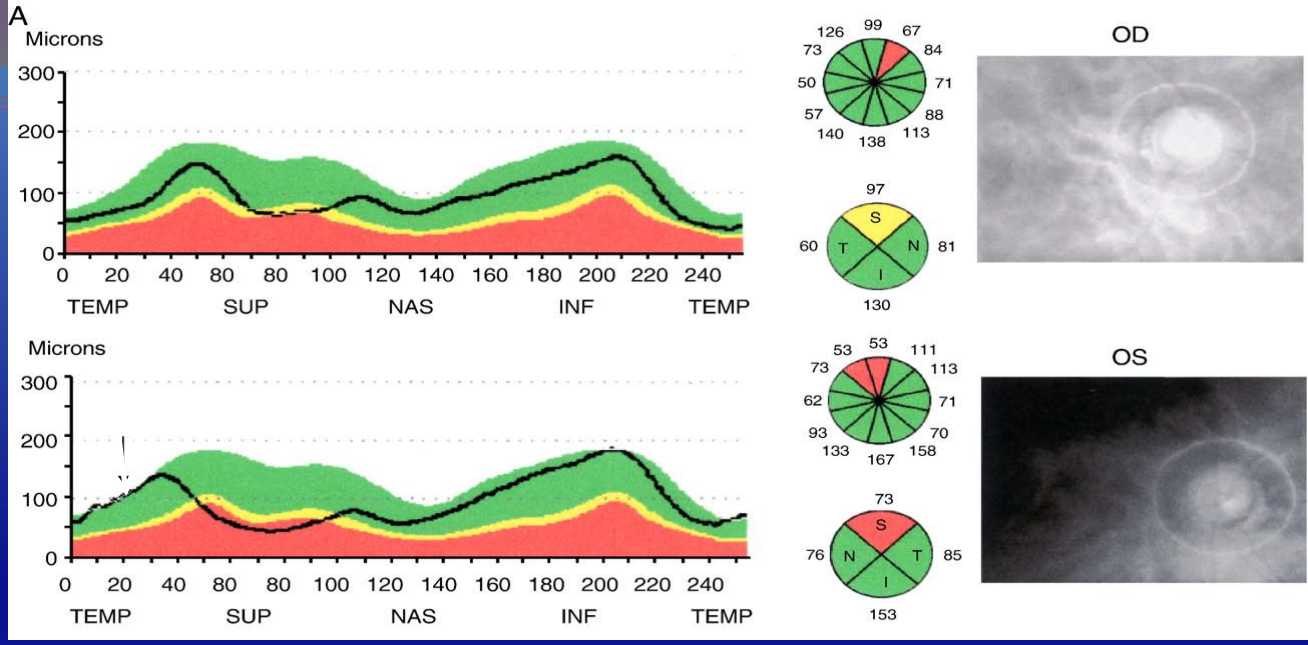


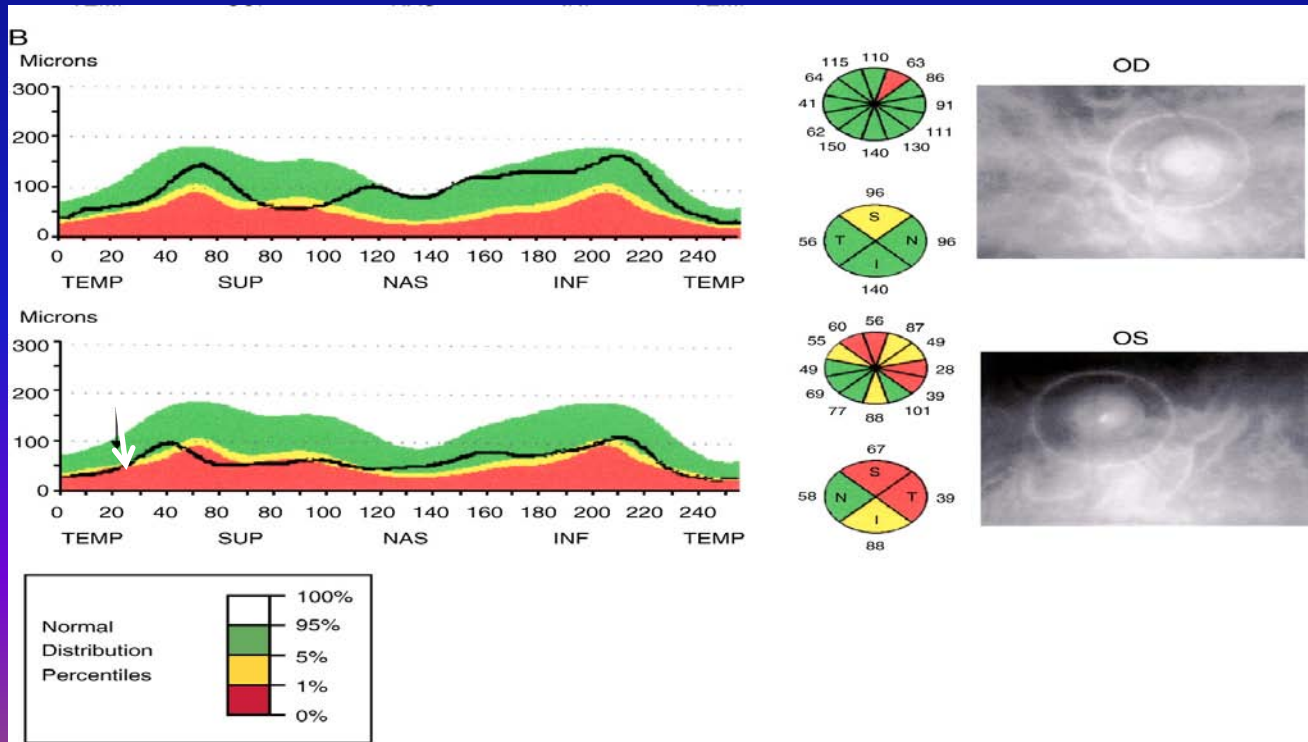
Neuritis Optica Retrobulbar

OCT

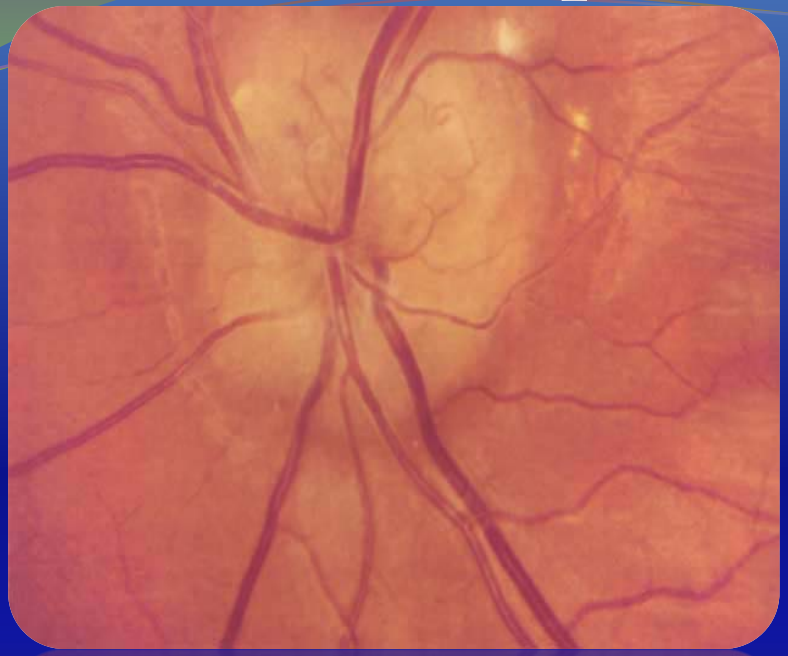
Mujer 16 años
Dism AV OI
OD 20/20
OI 20/40
FO: AO normal

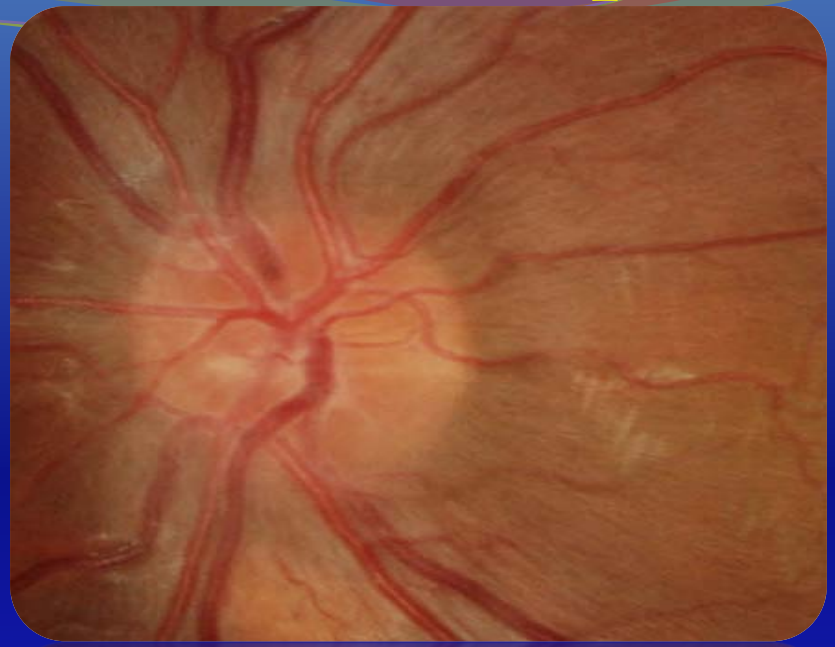
3 meses…
OI 20/20

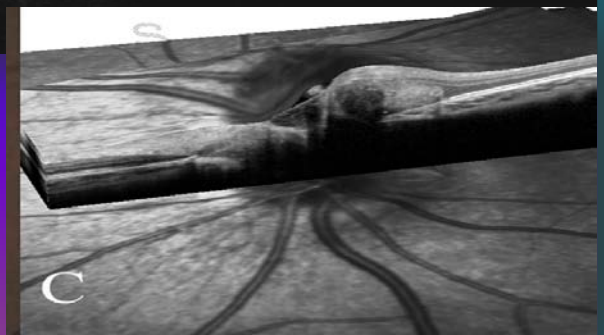




Drusen de Papila vs Edema de Papila







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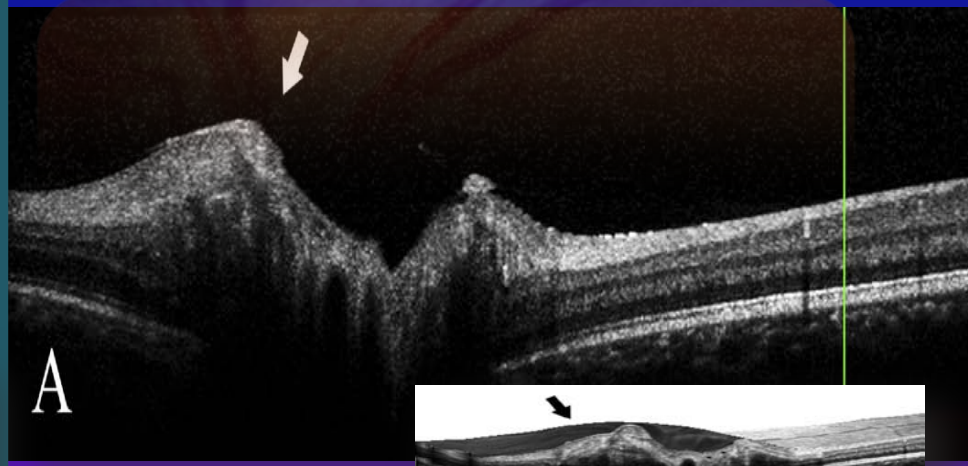
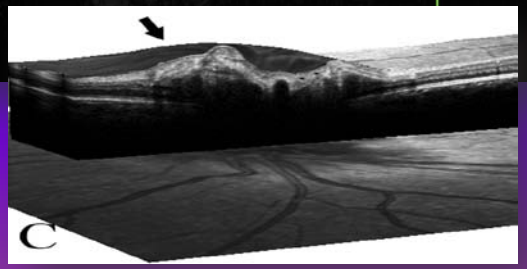
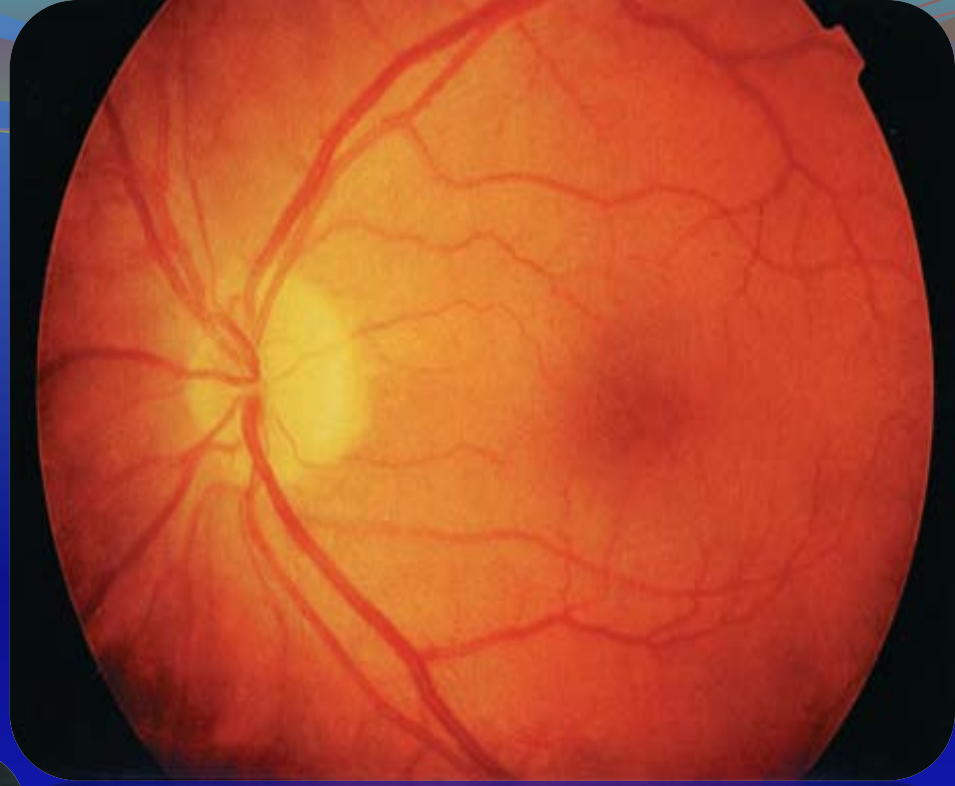


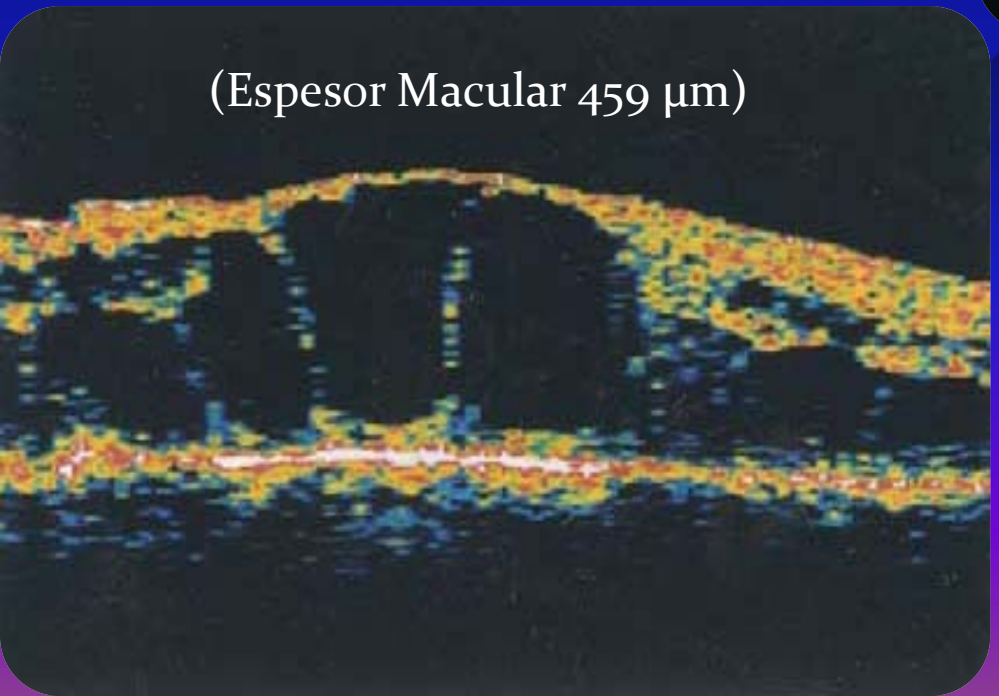


OCT

UVEITIS *intermedia*

Edema macular cistoideo





(Espesor Macular 459 µm)

Niña 7 años

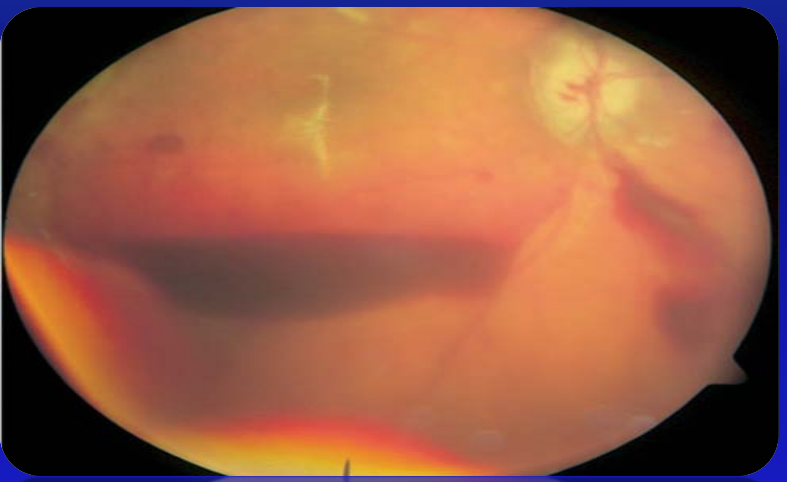
Disminución progresiva AV OI

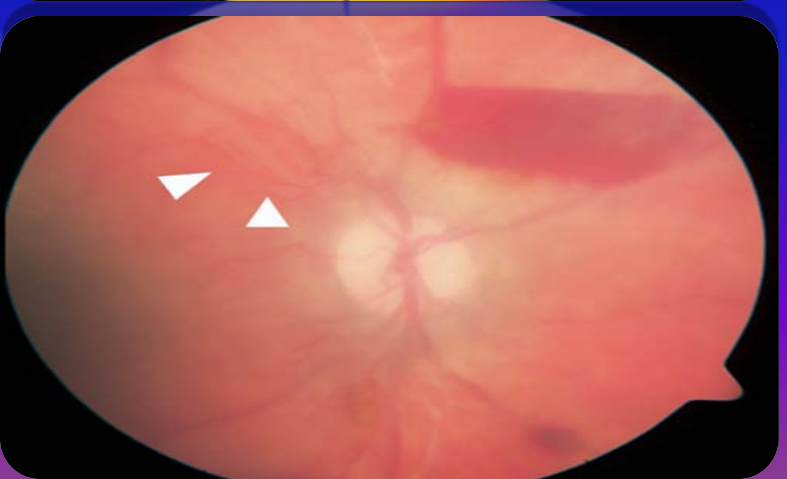
OCT - SHAKEN BABY SYNDROME

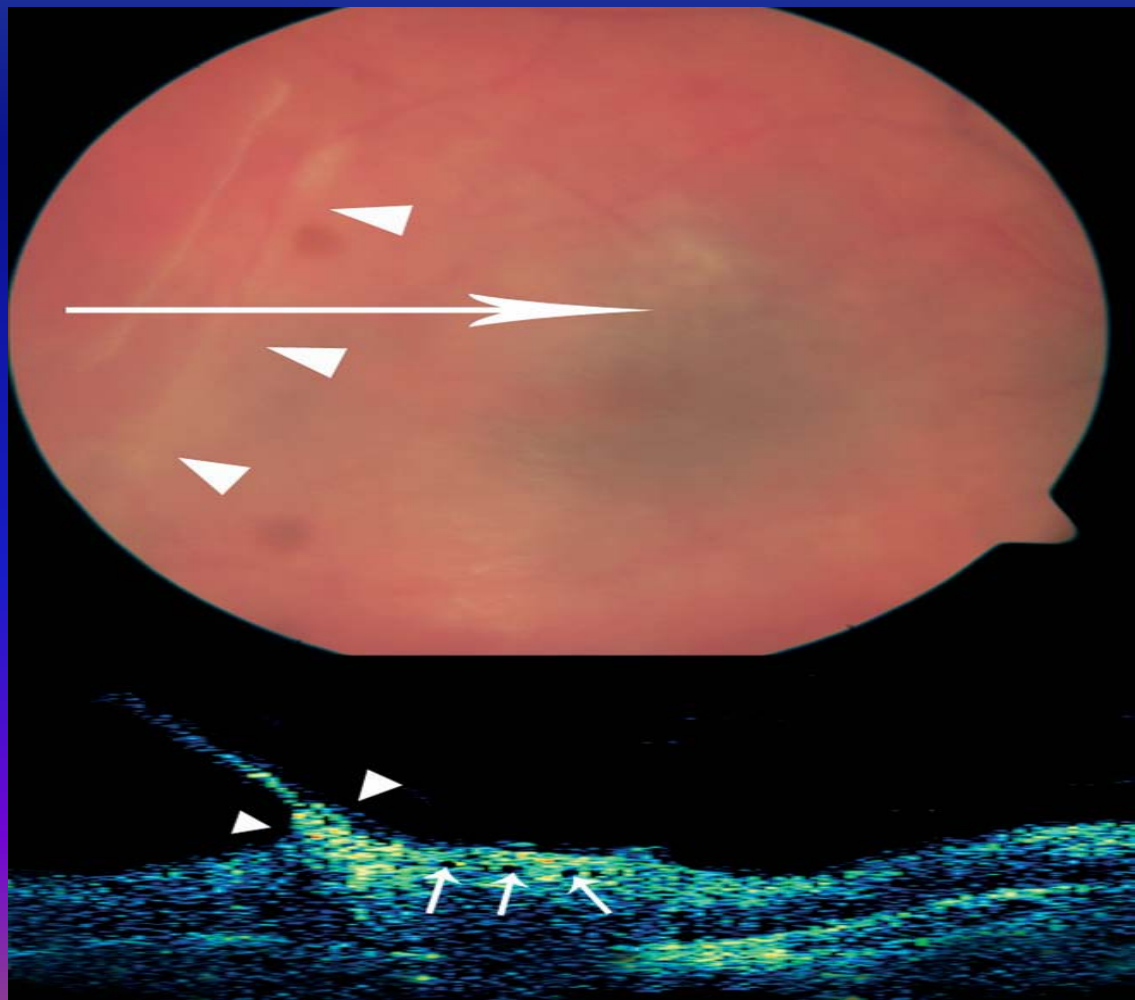
Varón de 7 meses
Convulsiones
Fractura de cráneo, hemorragia subdural, hematoma en el cuello

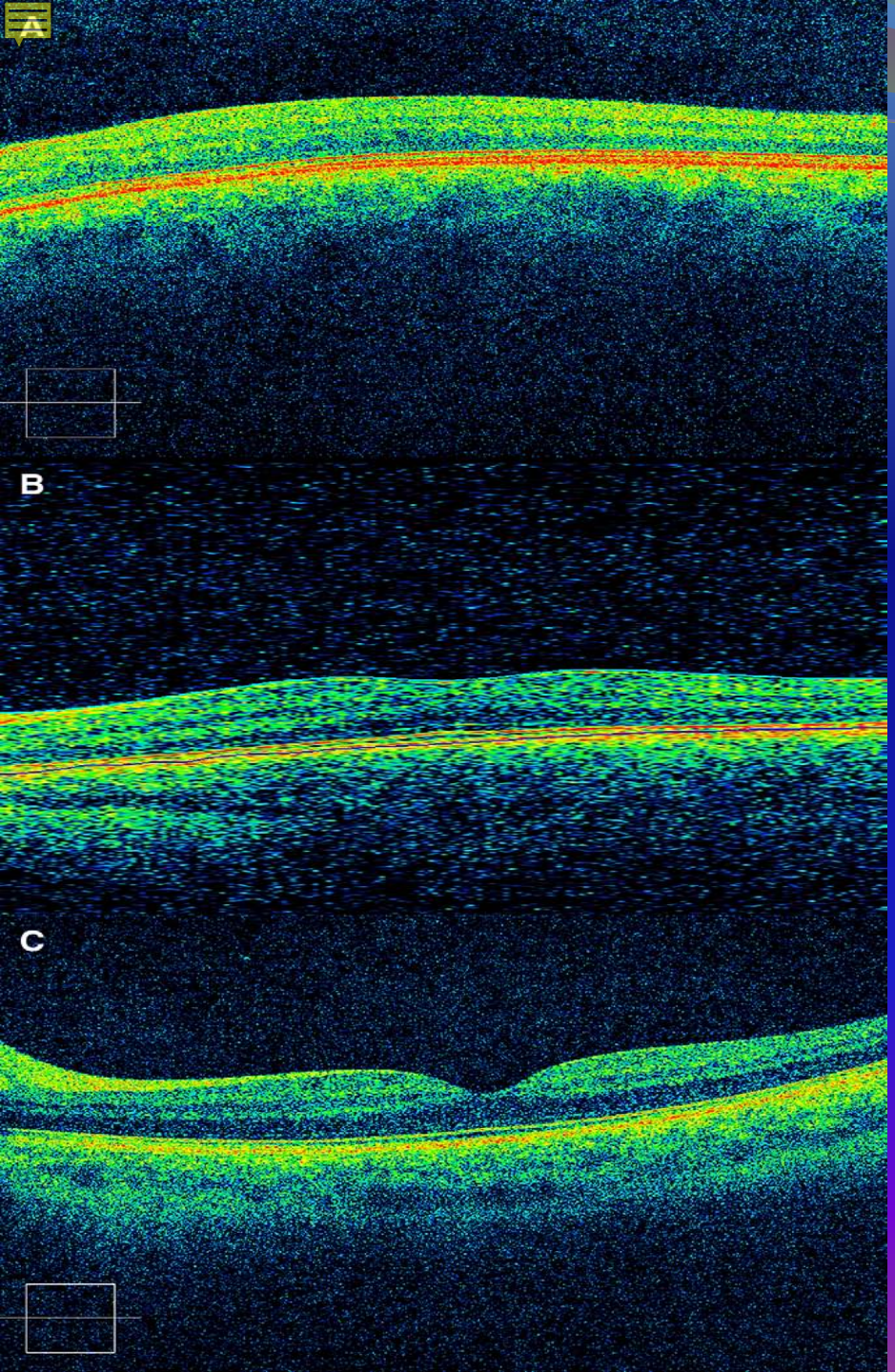
Mal Pronostico

Pliegue retinal perimacular
Retinosquisis Macular
Agujero Macular
Membrana epiretinal









OCT y NISTAGMUS

Albinismo Oculocutaneo

Fovea plana

Albinismo Oculocutaneo

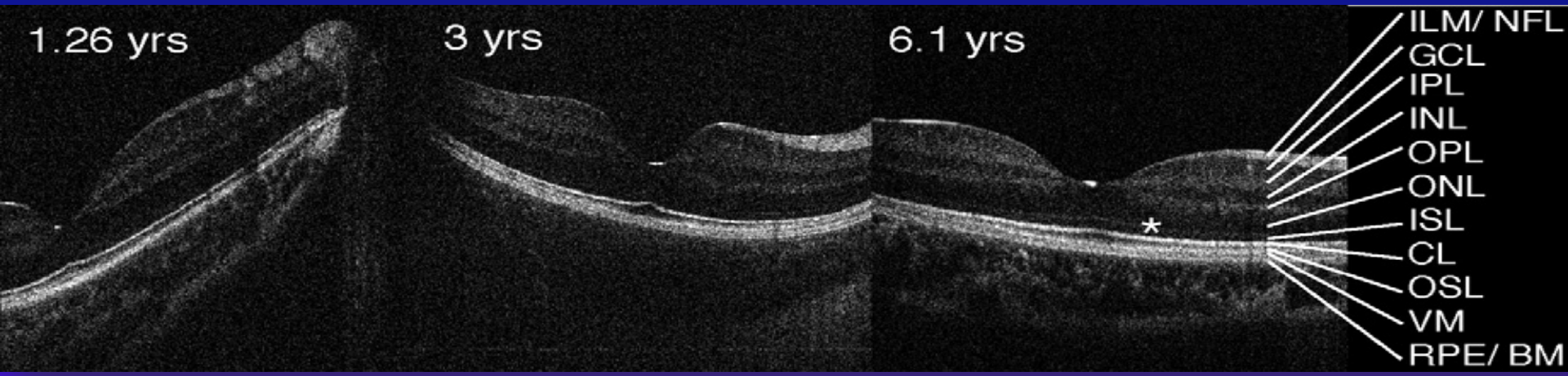
Diferenciación Foveal minima

Síndrome Nistagmus Infantil

Fovea normal

OCT / HRT

Si bien los parámetros aun no estan estandarizados para la población pediatrica, existen varios trabajos que muestran su utilidad en niños



Espesor Foveal : Niños (221µm) > Adultos (182µm)
Espesor CFNR : Niño = Adultos

Ophthalmology. 2006 May;113(5):786-91.Retinal nerve fiber layer thickness in normal children measured with optical coherence tomography.Salchow DJ et al

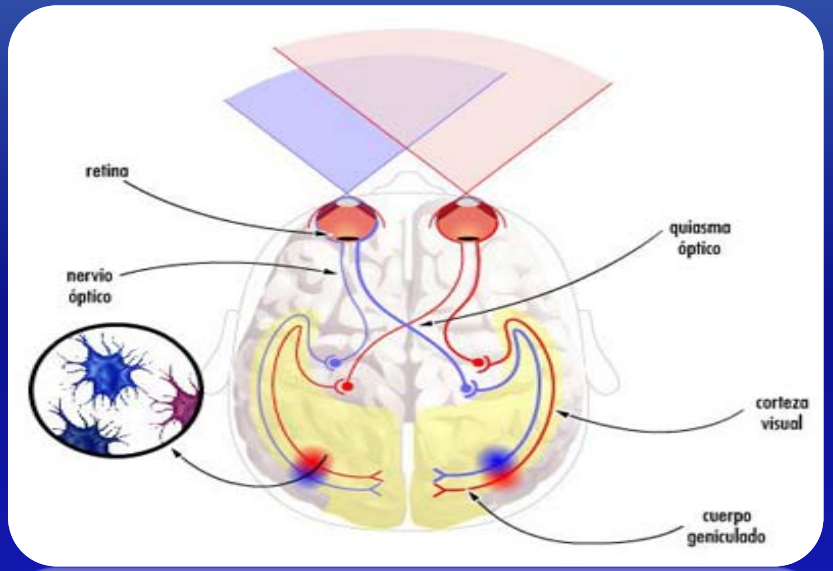
Am J Ophthalmol. 2007 Aug;144(2):309-10.**Profile of the retina by optical coherence tomography in the pediatric age group.Gupta G et al**

AMBLIOPIA Y GAFAS ELECTRONICAS

AMBLIOPÍA u "Ojo Vago"

↓AV causada por un desarrollo visual anormal

Falta de estimulación visual adecuada desde el nacimiento hasta los 7-8 años



Defectos refractivos (hipermetropía, miopía u astigmatismo), anisometropia, estrabismo y catarata congénita u opacidad corneal

Generalmente es unilateral

3 a 5% de la población

AMBLIOPIA Y GAFAS ELECTRONICAS

Tratamiento tradicional

Corrección óptica con gafas

Un tercio de los niños curarán su ojo vago sólo con llevar las gafas adecuadas

Dos tercios restantes necesitarán tratamiento rehabilitador

OCLUSION(tapar con un parche el ojo sano)

PENALIZACION (instilar gotas de atropina que dilatan la pupila y provocan vision borrosa)

AMBLIOPIA Y GAFAS ELECTRONICAS

Tratamiento alternativo al tradicional parche en el ojo...

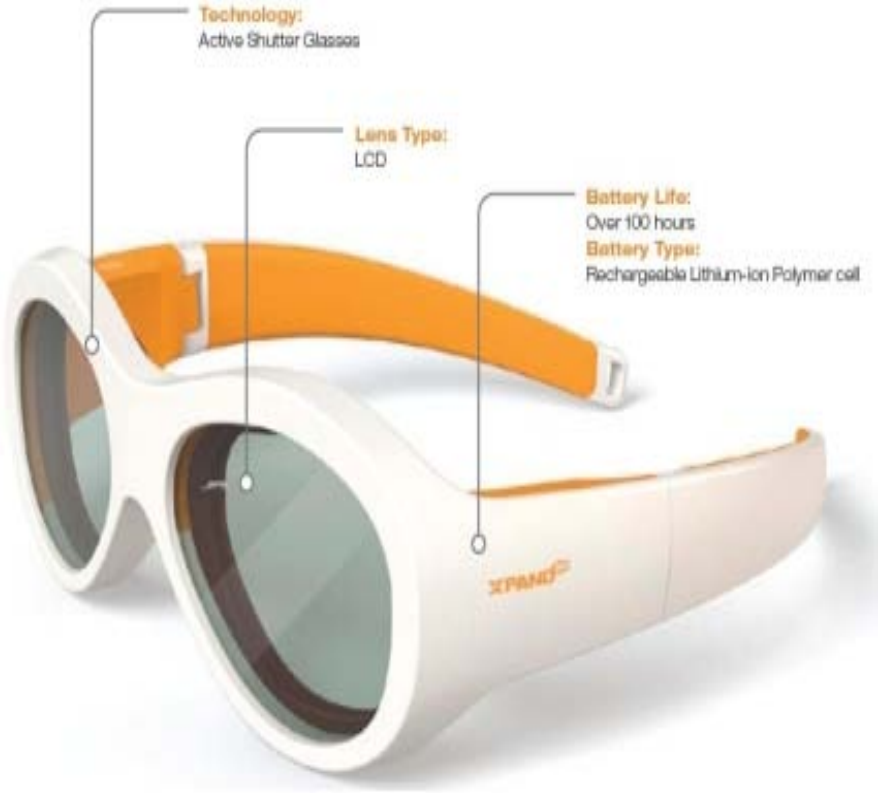
Amblyz™ Glasses

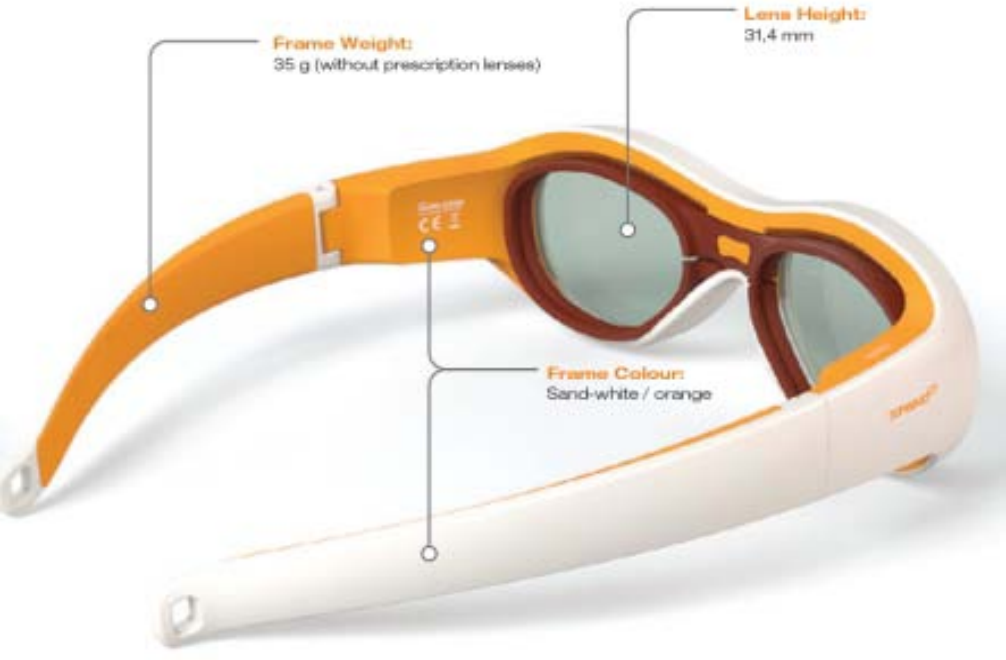
AMBLIOPIA Y GAFAS ELECTRONICAS

tecnología **LCG (Liquid Crystal Glasses)**

permite **oscurecer hasta ocluir la visión de uno de los dos ojos** y forzar de esta manera al otro a trabajar

batería disimulada en una de las varillas de la gafa le permite tener una autonomía de hasta 100 horas





programar la lente que debe ocluirse, durante cuanto tiempo y con cual frecuencia

obturador electrónico que está controlado por un microchip preprogramado e integrado a una lente óptica refractiva situada ante el “ojo sano”

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Clinical Ophthalmology

Clin Ophthalmol. Dec 2007; 1(4): 403–414.
PMCID: PMC2704537

Current concepts in the management of amblyopia

Blanca Ruiz de Zárate and Jaime Tejedor

Amblyopia treatment

Liquid crystal glasses

Liquid crystal glasses have recently been developed as a *new treatment for amblyopia*. Liquid crystal glasses with the appropriate correction provide an electronic, controlled, intermittent occlusion of the sound eye allowing for visual stimuli input to the amblyopic fellow eye. A liquid crystal glass in the sound eye is used as an intermittent flickering shutter switched between “on”, or occlusion, and “off”, or light transmission. The flickering sequence can be adaptated to the depth of amblyopia, the length of treatment, and the patient’s age.

In a short evaluation of the new treatment, ten amblyopic children fulfilled the study. After 5 weeks wearing this type of glasses near mean visual acuity had been improved reaching statistical significance. No control patients were included in the study (BenEzra et al 2007).

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Leading clinical and laboratory ophthalmology and vision research

Invest Ophthalmol Vis Sci. 2010 Jul;51(7):3395-8. doi: 10.1167/iovs.09-4568. Epub 2010 Feb 17.

Treating Amblyopia with Liquid Crystal Glasses: A Pilot Study

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± Author Affiliations

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↵2 Contributed equally to the work and therefore should be considered equivalent authors.

Abstract

Purpose. To evaluate the use of liquid crystal glasses (LCG) for the treatment of amblyopia caused by refractive errors, strabismus, or both.

Methods. In this noncomparative, prospective, interventional case series, 28 children (age range, 4–7.8 years) with monocular amblyopia participated, of which 24 completed the study. In the LCG, the occluding and nonoccluding phases of the flicker were electronically set in all patients at a fixed rate. The rate was set so that accumulated occlusion was 5 hours during 8 hours' weartime. Occlusion was applied only to the good eye. All 24 children were followed up regularly for 9 months. Best corrected VA for distance and near, fixation patterns, and binocular function were measured. VA for distance was measured with the Snellen chart and for near with the Rossano/Weiss chart.

Results. Mean VA for distance at the end of the study (after 9 months) was 0.59 (SD, 0.16) compared with 0.27 (SD, 0.09) at the beginning ($P < 0.001$). Most of the children (92%) complied well with the treatment. (Good compliance was defined as wearing the LCG for at least 8 hours per day.) Stereopsis at the end of treatment was good (better than 60 sec arc) in 21% of the children compared with 8% at the beginning. No serious adverse events were recorded.

Conclusions. The use of LCG in patients with amblyopia yielded an **improvement in near and distance VA and in stereopsis**. Treatment was **well accepted by children and parents.**

HOSPITAL DE PEDIATRIA
S.A.M.I.C.
"PROF. DR. JUAN P. GARRAHAN"

No invasivo – Diagn - Tto - Seguim

BAJA VISION Y TIFLOTEC NOLOGIA

HRT - OCT

AMBLIOPIA Y GAFAS ELECTRONICAS

Tratamiento alternativo al tradicional parche en el ojo...

HOSPITAL DE NIÑOS
H N R G
Dr. RICARDO GUTIERREZ

SINDROME VISUAL INFORMATICO

MUCHAS GRACIAS!!