

Children's Eyecare: Newer Tools and Strategies

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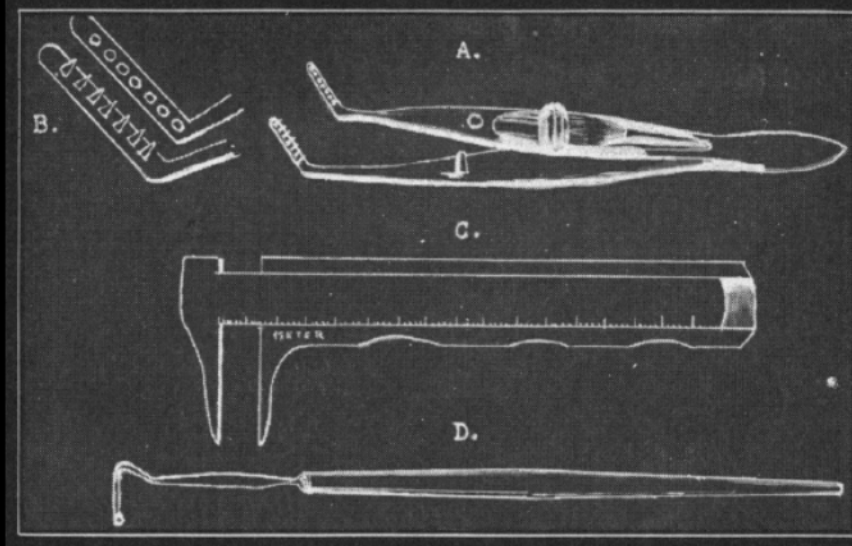


Fig. 10.—*A*, recession muscle forceps. *B*, detail of teeth of forceps. *C*, caliper. *D*, strabismus hook.

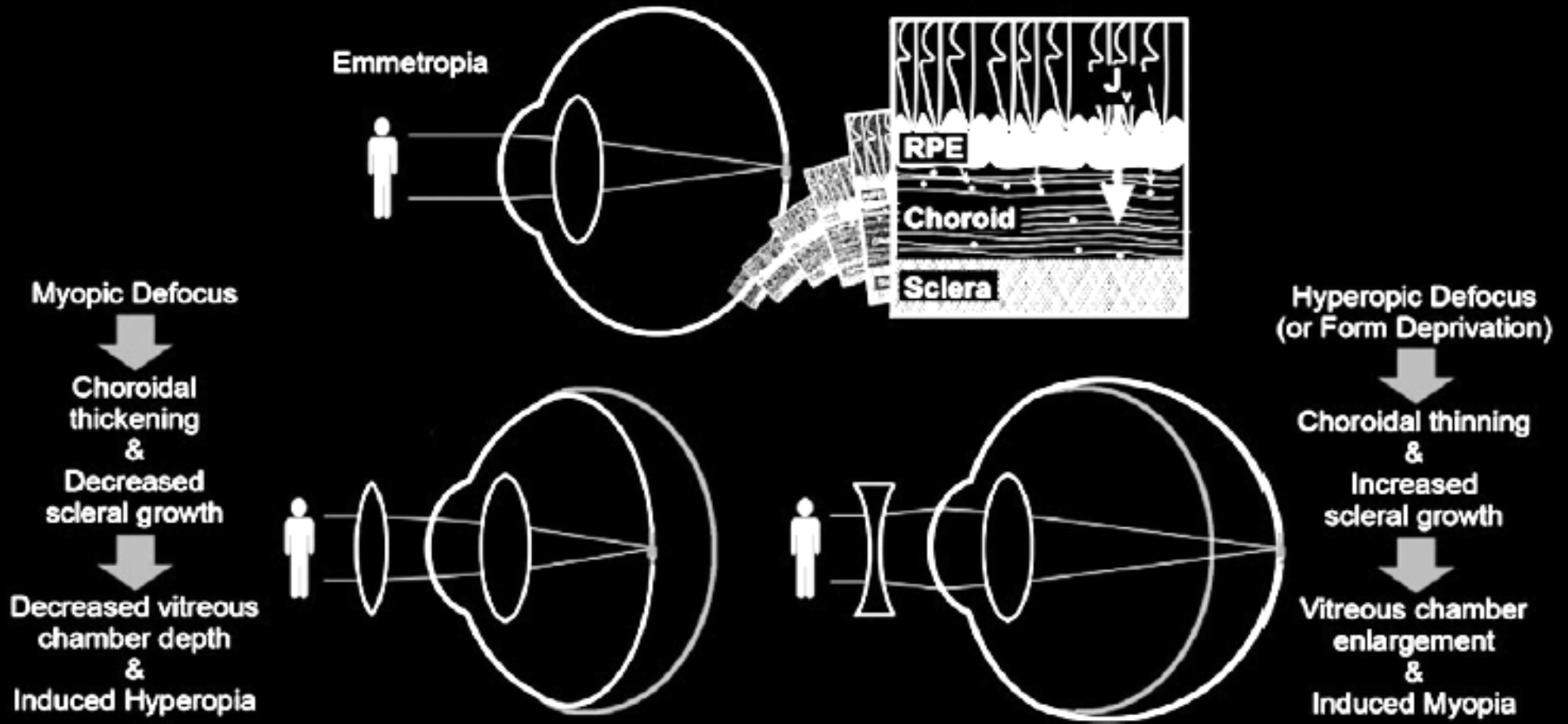
Children's Eyecare: Newer Tools and Strategies

- Myopia control
- Treating ROP
- RetFlix

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Local Control



Retina

↓ Dopamine
↑ Ach (M2)
↑ Adenosine
↓ Egr-1
↑ NO
↓ Glucagon
↑ Retinoic Acid
Amacrine cells
Ret ganglion cells

RPE

DA receptors
Ach recept (M2)
VIP recept
Glucagon recept
Ion transport (K, Ph, ↓ Cl channels)
Cytokines (IGF1, TGFβ, FGF, VEGF)

Choroid

Accomm (thickness)
K, Na, Cl
↑ DA &
↑ Glucagon (thicken)
Insulin
TGF-β, FGF, VEGF, TPA, MMPs

Sclera

(50% Coll I)
↓ Prot-gly syn
Ach recept
↑ FGF recptr1
TGFβ
integrins
↓ Collagen V/I ratio
↑ MMP-2
↑ cyclic AMP
↑ cyclic GMP

Acetylcholine blockade

- Proposed in 1920s
- Atropine blocks M_1 and M_3 receptors
- Paralyze accommodation (not nec.)
- Pirenzepine blocks only M_1 receptors
- Block receptors in the sclera, RPE and retina?

Clinical Trials

- Atropine 0.5% to 1% daily (multiple studies)
 - Slows myopic progression
 - Paralyzes accommodation
 - Photophobia
- Cyclopentolate 1% (Yen et al 1989) qhs
 - Slows progression by 0.3 D/y (vs 0.7 D/y atropine)
- Pirenzepine
 - Slows progression by 0.2 D/y

- ATOM 1 and 2 RCTs showed benefits of atropine 1%, 0.5%, 0.1% and even 0.01%

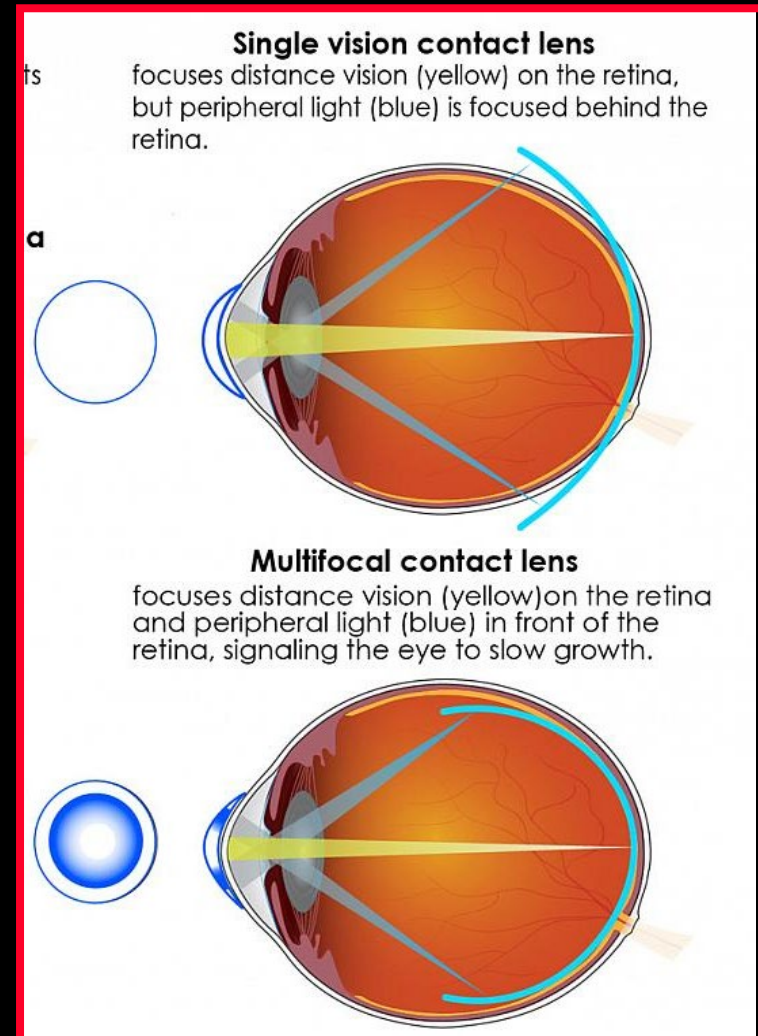
Chia et al *Ophthalmology* 2016

Myopia Control

- Better control achieved with Atropine 0.05% than with Atropine 0.01% but also has higher relapse rate
- Consider tapering Atropine treatment
- Consider transition from Atropine to multifocal contact lenses in teens

Myopia Control Contact Lenses

- MiSight
 - Multifocal contact lens
 - FDA approved for myopia control
 - BLINK RCT (JAMA 2020)
 - Manages peripheral defocus




Reduce chair time with AAPOS patient education video


aaapos
American Association for Pediatric Ophthalmology and Strabismus

Children's Eye Foundation of AAPOS

MYOPIA WEBCAST

AAPOS Myopia Webcast
Will my child's myopia get worse?



Watch on  YouTube

Reference: <https://www.aapos.org/wp-content/uploads/2018/05/Learn-Myopia-Parenting-as-Grow-Nurture-as-grow.png>. Last accessed 12/24/23

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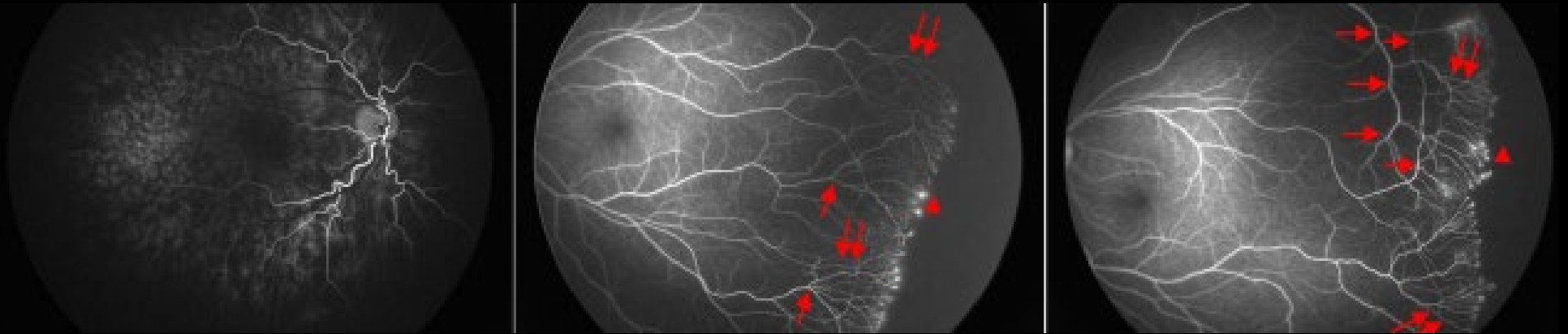
Treating ROP

- BEAT ROP RCT – NEJM 2011
 - Demonstrated efficacy of bevacizumab for treatment of type 1 ROP
 - Not FDA-approved
- FIREFLEYE ROP RCT – JAMA 2022
 - Demonstrated efficacy of aflibercept for treatment of type 1 ROP
 - First and only FDA-approved ROP drug
 - Higher rate of ROP reactivation requiring retreatment – 20.6%

Treating ROP

- FIREFLEYE ROP RCT – JAMA 2022
 - First and only FDA-approved ROP drug
 - Shorter half-life
 - Higher rate of ROP reactivation requiring retreatment – 20.6%
 - Potentially fewer systemic side effects

After IVT of Acute ROP



Treating ROP

- Varying treatment strategies of chronic avascularity after IVT
- Laser following IVT (Retina 2018)
 - At 60 weeks GA
 - Once peripheral vascularization plateaus at 12-18 weeks following IVT

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RETFLIX - New Retinoscopy Tool

- 3-D printed attachment for Welch Allen retinoscope
- Developed at Cleveland Clinic Cole Eye Institute
- \$45



RETFLIX - New Retinoscopy Tool

- Place smartphone in tray
- Play video
- Entertains patient while maintaining proper alignment with visual axis





Questions?

