

Children's vision – the big issue!

(Fiddling today, knowing that Rome will burn tomorrow)

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DISCLOSURE

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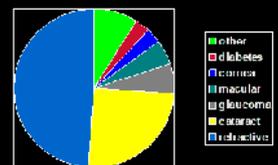
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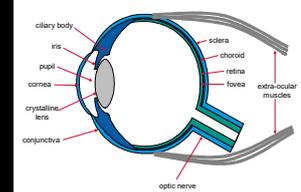
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The big issue

- What is the commonest cause of visual impairment?
- Myopia is the most common vision disorder and the leading cause of visual impairment worldwide (Tkatchenko et al., 2015)



Pie chart figures approximate, based on data on WHO website



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It's like an epidemic!

- 93% of Taiwanese medical students are myopic (Lin et al., 1996)
- Prevalence of myopia in UK has more than doubled in last 50y (McCullough et al., 2016)
- 50-53% of UK university students are myopic (Logan et al., 2005)



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Why does myopia matter?

- Significant health impact of myopia
 - High myopia (≤ -6) increases risk of retinal detachment, myopic macular degeneration, glaucoma, & other conditions
 - "no evidence of a safe threshold level of myopia for any of the known ocular diseases linked to myopia" (Flitcroft, 2012)
 - In the Copenhagen study myopia-related diseases are already the most common cause of impaired vision (Holden et al., 2014)

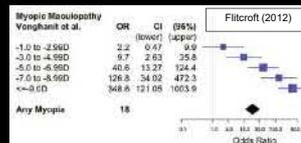


Fig. 3. Forest plot of odds ratio for myopic maculopathy by the different refractive states derived from the Blue Mountains Eye Study. The horizontal lines in this type of plot represent the 95% confidence intervals and the size of the square the sample size in each stratum.

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Some myths about vision screening

- ✦ Only amblyopia matters
- ✦ Vision is stable throughout childhood
 - Health For All Children (HFAC 5) still stops at age 5y
- ✦ “children with bilaterally poor vision will largely present” (HFAC 5; c.f., Thomson, 2002)

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Behavioural interventions

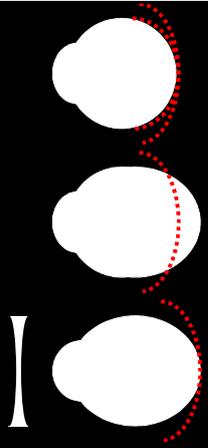
- ✦ Risk of myopia onset slightly reduced by
 - More time outdoors (1h pw → 2%; Wildsoet et al., 2019)
 - Less near vision
- ✦ Balanced life = balanced vision





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Myopia: the new view



Patient about to become myopic

- image still focused on retina at fovea
- image focused behind retina in periphery
- *relative peripheral hyperopic defocus* - RPHD

Reviews: Charman & Radhakrishnan (2010); Earl Smith (2011); Filcroft (2012)

The eye grows so the peripheral image is in focus causing myopia at the fovea

Spectacles or contact lenses correct the focus at the fovea, but not the RPHD so myopia progresses

BUT: see Atchison et al. (2015)
Relative peripheral hyperopia does not predict development and progression of myopia in children

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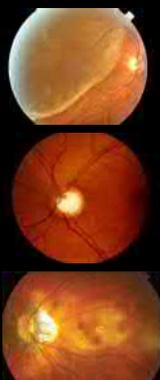
Active interventions for myopia control

- ✦ Centre distance multifocal contact lenses & orthokeratology slow myopia progression by ~40% Wildsoet et al., 2019
- ✦ 1 Asian study indicates MyoSmart spectacle lenses slow myopia progression by ~50% Lam et al., 2019
- ✦ No evidence that low dose atropine reduces axial elongation Brennan & Cheng, 2019

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Why bother?

- Reducing the rate of myopia progression by 50% would lead to reduction in frequency of high myopia of over 90% (Brennan, 2012)
- For person destined to be -6.00 (Flitcroft, 2012)
 - No control: -6.00: RD risk 16x MMD risk 40x
 - 50% control: -3.25: RD risk 10x MMD risk 10x



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Conclusions

- It is premature to recommend myopia control as a public health intervention
- BUT:
 - Myopia is a public health issue Flitcroft, 2014
- In the short-term:
 - Is myopia going undetected?
 - Is there a health inequality?
- In the long-term:
 - Myopia control interventions for the masses?



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