WHEN THE PEDIG GUIDELINES DON'T WORK FOR YOUR PATIENT…

WHAT NEXT?

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When PEDIG fails your pt…. Summary

- Possibly poor compliance
- Try atropine
- Try more patching
- Keep the therapeutic environment alive & active
- You may have missed an organic factor
- Fix the strabismus [?torsion too]
- Refractive surgery

PEDIG IS ‘REAL LIFE’

- We prescribe a treatment and see how effective the ***treatment instruction*** is.
- Calendar diary is only monitor of compliance.
- If the doctor prescribes 2h/d or 6h/d, what REALLY happens?

Awan M, Proudlock FA, Gottlob I The effect and compliance of strabismic amblyopia monitored with the ODM [abstract]. Invest Ophthalmol Vis Sci 44[Suppl]: S199, 2003]164,483).

- Parent diaries overestimate actual patching time when monitored with electronic Occlusion Dose Monitor
- This may be why PEDIG demonstrates no difference between prescriptions of 2h vs 6h/d or of 6h vs full-time occlusion with calendar-marking parent self-report to measure compliance

Does compliance matter?

- In 14 newly identified amblyopic children compliance was measured electronically over 1w, 6m after the start of occlusion therapy with a patch with electronic sensor [Occlusion Dose Monitor].
- Compliance : % of electronically registered time c.f. prescribed occlusion time.

Mean age 4y. Anisometropia =5, strabismus =4 and anisometropia and strabismus =5.

Electronically measured compliance with occlusion therapy for amblyopia is related to visual acuity increase. Loudon SE, **Polling JR**, **Simonsz HJ** . Graefes Arch Clin Exp Ophthalmol. 2003

Compliance matters

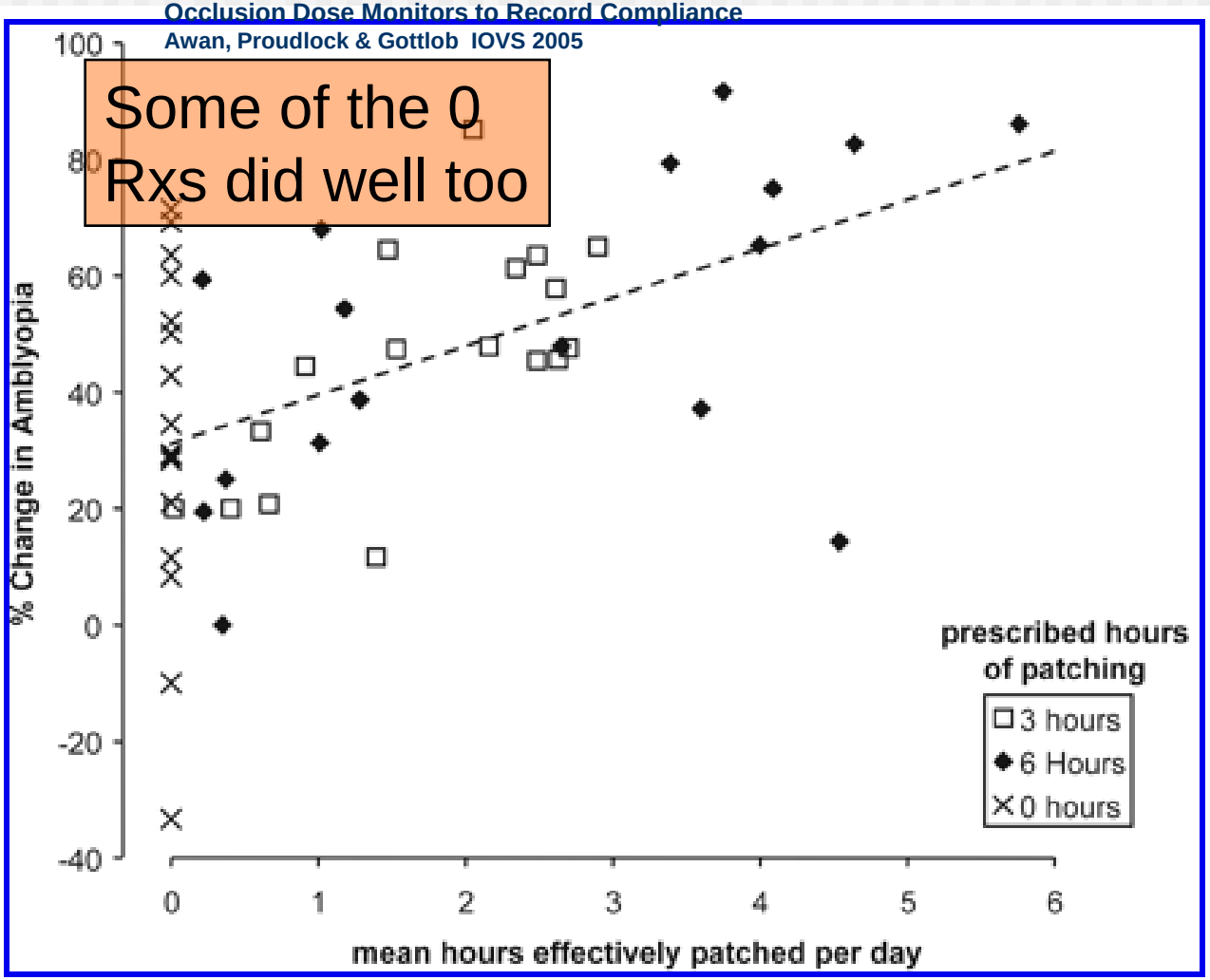
n=	Acuity increase	Compliance p=0.04
8	Satisfactory	80%
6	Unsatisfactory	34%

Satisfactory acuity increase following 6m of occlusion therapy was defined on reaching any of the following criteria:

- acuity increase expressed as a ratio between acuity of the amblyopic eye and acuity of the good eye of more than 0.75,
- acuity of the amblyopic eye exceeding 0.5 as measured on the E or Landolt-C,
- or 3 LogMAR lines of increase in acuity.

- **Electronically measured compliance with occlusion therapy for amblyopia is related to visual acuity increase.** Loudon SE, **Polling JR**, **Simonsz HJ** . Graefes Arch Clin Exp Ophthalmol. 2003

A Randomized Controlled Trial of Unilateral Strabismic and Mixed Amblyopia Using Occlusion Dose Monitors to Record Compliance
Awan, Proudlock & Gottlob IOVS 2005



Positive relation b/w **effective** hours patched & improvement in amblyopia

FIGURE 6. Percentage change in amblyopia $[(VA_{as} - VA_{ae})/(VA_{as} - VA_{de}) \times 100\%]$ versus mean hours effectively patched (measured with ODMs) in the 3 groups showing a significant relation between effective hours patched and improvement in amblyopia. Only one patient achieved 6 hours of effective patching.

Treatment Dose Response in Amblyopia Therapy:

The Monitored Occlusion Treatment of Amblyopia Study (MOTAS)

Catherine E. Stewart,1 … IOVS 2004

Compliance with patching 48%

Increasing dose to >2h/d : faster response, final outcome same.

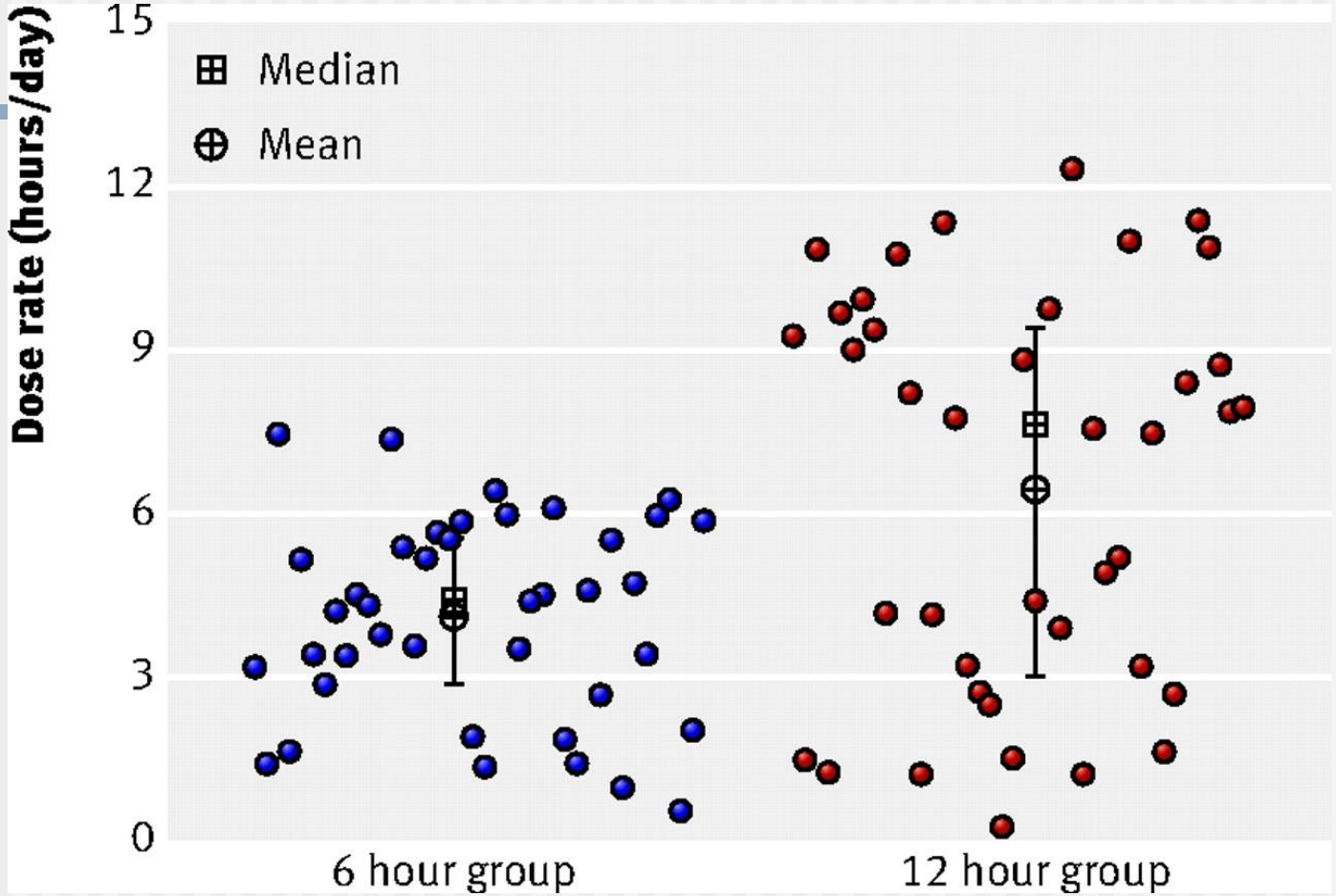
80% of improvement occurs in first 6w

Treatment results better <4yo c.f. >6yo

Results. Data were obtained from 94 participants (mean age, 5.1 ± 1.4 years) with amblyopia associated with strabismus (*n* = 3[illegible] and strab[illegible]apta- tion. [illegible]rela- tions[illegible]usion dose[illegible]nd 2 h/d [illegible]More than [illegible]urred with [illegible]etter for c[illegible]older than [illegible]

Conc[illegible]ount of patching therapy received has provided insight into the dose–response relationship of occlusion therapy for amblyopia. Patching is most effective within the first few weeks of treatment, even for those in receipt of a relatively small dose. Further studies are needed to elucidate the neural basis for the dose–response functions. (*Invest Ophthalmol Vis Sci.* 2004;45: 3048–3054) DOI:10.1167/iovs.04-0250

Fig 2 Achieved dose rate in children allocated to six or 12 hours of occlusion a day. Vertical lines indicate interquartile range. To enhance clarity, dots have been jittered horizontally

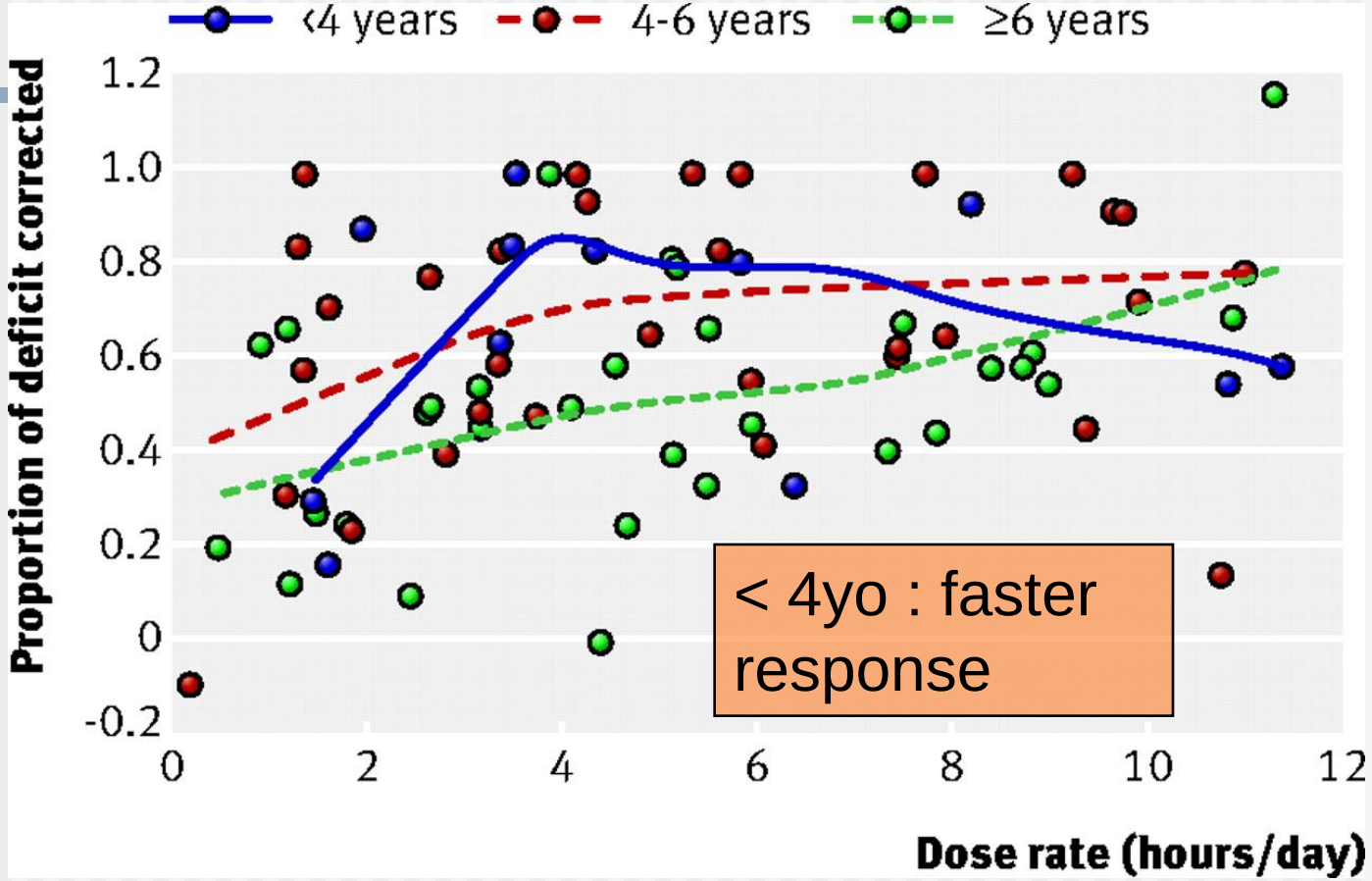


Stewart, C. E et al. BMJ 2007;335:707

- **6h/d**: received 4.2 [± 0.5] h/d
- **12h/d**: received 6.2 [± 1.1] h/d p=0.06

BMJ

Fig 5 Age of children at start of occlusion as a function of age. Fitted lines are default LOWESS (locally weighted smoothed) line of best fit



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BMJ

Dose-response @ different ages

< 4 years old:

- low dose rates (<3 h/d) are effective, with slight (p=0.54) additional gains for doses >3h/d

> 4 years old:

- significant differences between <3h/d & 3-6h/d
- no difference between 3-6h/d & 6-12h/d

> 6 years old:

- <3h/d had little effect; need >3h/d

MOTAS …several studies

1 line gain:

- needs ~ 120h occlusion

2 line gain:

- 4y: needs 170h
- 6y: needs 236h

Tentative conclusions

- More is better
- Younger is better

Bill Scott : **MUCH** more is always better

Amblyopia Treatment Outcomes J AAPOS 2005

- All patients : full-time occlusion = **all waking hours**; if result inadequate, **24h/d.**
- Success : 20/30 or better or equal VA by fixation pattern.
- 600 pts followed up after cessation of FT patching [mean 7y]. 89% followed > 1 y.

Bill Scott : Amblyopia Treatment Outcomes

EXCEPTIONAL RESULTS

- 96% attained “success”. 60%: equal visual acuity.
- 6/12 - 6/30 : 6/9 or ≥ 3 lines improvement:

PEDIG ~80%, Scott **98**%

- Younger: less occlusion time to endpoint & better visual outcome (P = 0.0001).
- Incidence of occlusion amblyopia was 26%. Nearly all treatable.

Problems:

- **19%** lost to followup
- PEDIG: n= 419 **S 38%**, A 37%, A+S 24%.
- Scott’s 600: **S 73%,** A 9%, A+S 17%

Intensive occlusion therapy for amblyopia. Dorey SE…. BJO 2001

39 children who failed prolonged outpatient treatment for amblyopia: admitted for **5 days of supervised intensive inpatient occlusion therapy**

- 26 (67%) gained ≥ 1 line
- 5 (13%) gained ≥ 3 lines (mean gain 1.03 lines)

Last recorded visit [median 14 mo after discharge]:

- 13 (33%) ≥ 6/12 in their amblyopic eye.

Maybe more isn't always better…

- **A comparison of various methods of treatment of amblyopia. A block study** Watson PG… TOSUK 1985
- **Conventional occlusion [opaque patch> 3h /d]** &
- **Minimal occlusion [20 - 30min/d with near task]** &
- **CAM gratings [7 - 10 min/w]** for treatment of amblyopia ….
- .. investigated in 2 populations: England & Turkey.
- Each of these methods of treatment was **equally effective** as an initial therapy.
- If one form of therapy was ineffective or only partially successful, further improvement can be obtained by using an alternative method.
- Improvement with glasses alone not controlled

Maybe more isn't always better…

MOTAS:

- Higher dose rates achieve the best outcome more rapidly but at a risk of accumulating excessive non-therapeutic hours of patching….patching for all waking hours is almost certainly excessive....

Tentative conclusions

- More is better

..but for many, less is fine

- Younger is better

Strabismic Amblyopia

- Does alignment result in better response to amblyopia therapy?…or no need for amblyopia therapy?

Timing of amblyopia therapy relative to strabismus surgery Lam GC, **Repka MX**, **Guyton DL** Ophthalmology. 1993 Dec

- 47 children < 8 y with both amblyopia and esotropia.
- 26 : amblyopia fully treated before surgery
- 21 : surgery before completing amblyopia therapy.
- **5/21 did not require amblyopia therapy after surgery even though they were still amblyopic before operation.**

When PEDIG doesn't work for your patient is it organic?

Not just amblyopia -

- recheck for ON Hypoplasia ; disc should be > small circle on Welch Allyn
- Abnormal macula [OCT]

Amblyopia treatment failures 6/24 or worse more likely to have thicker maculas on OCT = macular hypoplasia p=0.006

Preliminary data from personal series - unpublished

When it doesn’t work for your patient: is it the Parents?

- Parents dislike parading an obviously defective child
- Parents don’t like inflicting discomfort on their child

Types of parents ……

- Type A:

on Thursday we only did 5h 20m, so we made up for it on Friday with 6h 40m

- Type B:

We’re careful to do it all the time.. but we forget sometimes when we’re busy….

- Type C:

s/he hates it…. we haven’t managed for the last week…. s/he was sick… we were on vacation… we let the nanny look after it.... s/he only does it @ school…

Helping the parents: Therapeutic environment

- Some parents need help to maintain enthusiasm for a task which everyone finds difficult
- Keep the therapeutic environment alive / active e.g. ring daily

When it seems not to be working for your patient: maybe it IS working

It IS working but the 3 yo won't do vision tests properly.

LE doesn't get to Allen pix 6/30 BUT:

- Now accommodates for near
- It used to take +6 extra RE to cause fixation switch, now +3 will do it
- Functions normally with patch on

Sweep VEP can help doctor and parent anxiety

Is atropine better than patching for some children?

- Q’aire:

parents who had used both atropine and occlusion at different times for their child

- **2/3 prefer atropine**
- Does ↑preference mean better compliance → better effect?

Post- Darwinian treatments

- 1. Refractive surgery
- 2. Drugs
- 3. Unorthodox techniques

Refractive surgery

- Works in a significant minority of anisometropic amblyopes
- Safe in short term, probably in medium term
- Personal experience 0

Drugs : L- Dopa / Citicholine

- Anecdotally helpful in some cases of resistant amblyopia
- LK: Columbus information / consent forms and doses

Drugs

- **The Antidepressant Fluoxetine Restores Plasticity in the Adult Visual Cortex**
- Jose Fernando Maya Vetencourt, *et al.*
- *Science 320,385 (2008)*

Prozac Makes Old Brain Cells Young

- **Research may explain antidepressants' effectiveness** *By Ed Edelson*

Posted 4/17/08 THURSDAY, April 17 (HealthDay News)

The antidepressant Prozac has been shown to restore old brain cells to their more plastic youthful condition in animal experiments… possible new explanation for the antidepressant activity of the medication ….. could be used to treat other conditions caused by malfunction of brain cells…

Post- Darwinian treatments…

Observation on therapeutic effect of auricular point sticking combined with Tongshiji treatment on child ametropic amblyopia Zhongguo Zhen Jiu. 2008 Apr;28(4):270-2

CONCLUSION:

- Auricular point sticking combined with Tongshiji treatment for child ametropic amblyopia …. convenient manipulation, obvious and rapid therapeutic effect.

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