Fitting Kids with Contact Lenses

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Disclosures

- I have no relevant financial or nonfinancial relationships in the products or services in this presentation

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End of Lecture, You Will Be Able To

- Talk to parents about pediatric contact lens wear
- Comfortably fit kids with contact lenses

Anecdotal Evidence

Location	Age of First CL Fit
United States	12 or 13 years
Australia	12 or 13 years
Europe	14 or 15 years
Asia	17 or 18 years

Pediatric Fits
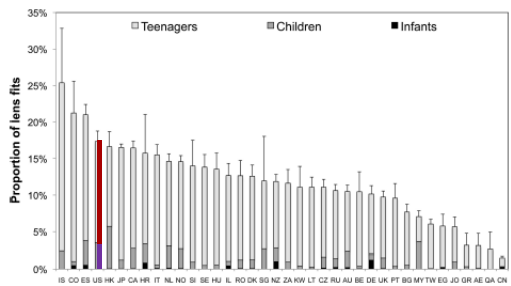
Efron N, et al. OVS 2011;88:461-8

Why Fit Kids?!

Unique in Your Area
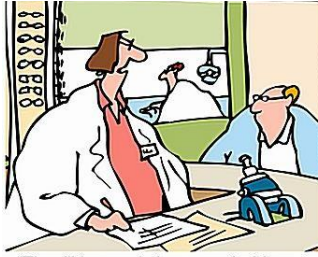
"They'll be ready in a month. It's not my fault you couldn't read the fine print."

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Additional Income

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Free Advertising

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Kids are Fun!

How to Introduce Contact Lenses

Skip for Joy
Kids can wear contact lenses!

Schedule an appointment in the
Kids Contact Lens Clinic

Would your child be happier in contact lenses?

Kids Contact Lens Clinic

Schedule an appointment
688-3937

Bring a smile to your child's face.

Fit her with contact lenses!

I love my contact lenses!

Make an appoinment in the Kids Contact Lens Clinic

Think glasses work in this situation?
Think again!

Kids Contact Lens Clinic

Contact lenses help him see the ball

Sunglasses protect him from the bright sun

Kids Contact Lens Clinic

Tell Everyone

Tell Athletes and Image Consious Kids

Staff Must Have Same Message

Ask the doctor…

First-Time Correction?

Can't Care for Glasses

How Do You Treat Children?

Empathetic Parent

Crazy Aunt or Uncle

Anesthetic for Orthokeratology

- Put a drop in the OK lens before insertion
  - Displace most of the drop by putting finger in lens
  - Can't teach I/R <15 minutes, so won't leave with anesthetized cornea

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If the Parent Gets in the Way…

Teaching I/R

- 45 minutes to 1 hour maximum for each training session

Dispensing Lenses

- If not *removed* alone, not taken home!

Swimming

- Don't swim in CL…period
- Swim in them, but dispose
- Swim in them, but clean
- Swim with goggles only
- Swim in CL…period

Contact Lenses In Pediatrics (CLIP) Study

- Purpose: 8-12 versus 13-17
  - Do children require more time to fit?
  - Are children at greater health risk?
  - Do children benefit less than teens?
  - How often buy own lenses after study?
  - Do children report more symptoms?

clip
contact lenses in pediatrics

Inclusion Criteria

- 8 to 17 years old
- Sphere between +5.00 and -9.00 DS
- Astigmatism less than -2.25 DC
  - Non-cycloplegic subjective refraction

	Children	Teens
Age	11.0 ± 1.3	14.7 ± 1.2
Sphere Equiv (D)	−2.09 ± 2.21	−2.62 ± 2.10

Do children require more chair time?

Time for Contact Lens Fitting
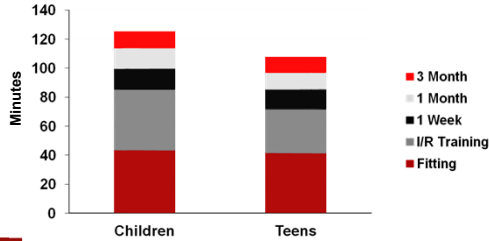
Time for I/R Training
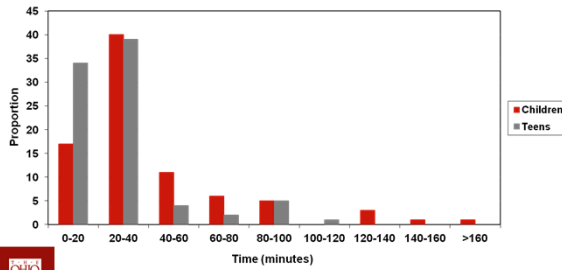
Factors Related to Time Multivariate

▶ Extremely easy to fit   88 minutes
▶ Easy to fit   104 minutes
▶ Difficult to fit   114 minutes
▶ Extremely difficult to fit   167 minutes
  ◦ Adjusted for age

▶ Doctor's Impressions
  ◦ Motivation
  ◦ Anxiety
  ◦ Maturity
  ◦ Hygiene
  ◦ Aperture size
  ◦ Parental enthusiasm

Are kids at greater risk?

Biomicroscopy

	Baseline	3 Months
Corneal staining	3.0	6.0
Conjunctival staining	7.1	19.9
Bulbar redness	10.7	13.3
Limbal redness	4.7	8.0
Upper tarsal	29.7	26.5
Lower tarsal	20.7	17.2

Recall of Information

	Children	Teens
Baseline	93.5%	93.6%
3 Months	87.8%	91.9%

Sign test, p = 0.006

Sign test, p < 0.001 Sign test, p = 0.13

Do Children Benefit Less?

Compare Modalities for Myopia Control

Diff RE ■ Diff AL ●

Y-axis left: Diff Eye Growth (mm) — 0.0, 0.1, 0.2, 0.3, 0.4
Y-axis right: Diff Myopia Progression (D) — 0.00, 0.25, 0.50, 0.75, 1.00

X-axis: MFCL, OK, MF Spec, A <0.1, A ≥0.1, Pirenzepine, Under, GP

0.1 mm AL = 0.25 D RE
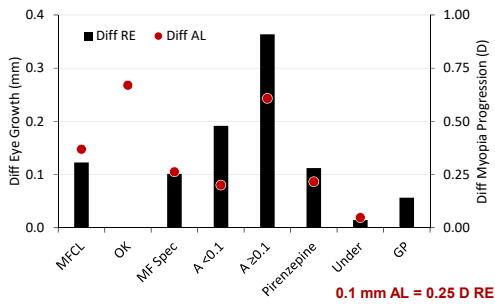
Orthokeratology Myopia Control

Diff RE ■ Diff AL ●

Y-axis left: Diff AL (mm) — 0.00, 0.10, 0.20, 0.30, 0.40, 0.50
Y-axis right: Diff RE (D) — 0, 0.25, 0.5, 0.75, 1, 1.25

½ yr   2 years   5 yrs

X-axis: Swarbrick (15), Charm (13), Chen (13), Cho (105), Cho (12), Kakita (11), Paune (15), Santodomingo (12), Walline (09), Zhu (14), Hiraoka (12)

Average Difference
AL = 0.27 mm
Time = 2.1 years
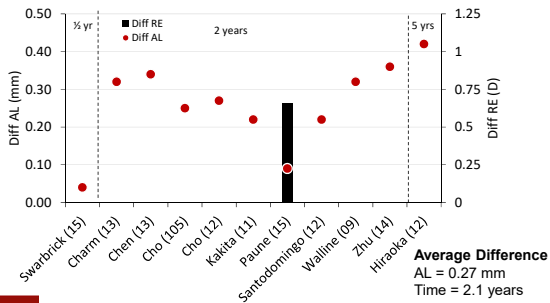
Soft Multifocal Myopia Control

Average Difference
RE = 0.31 D
AL = 0.15 mm
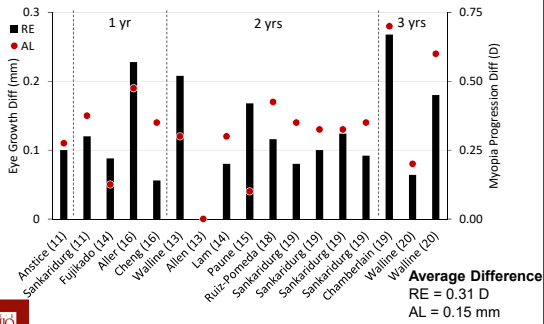
PREP Baseline
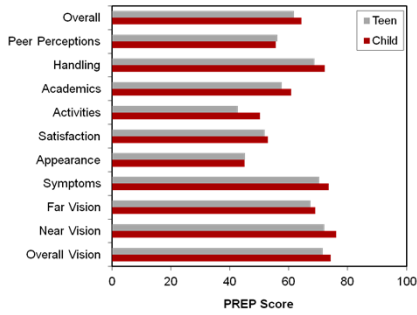
PREP 3 Months
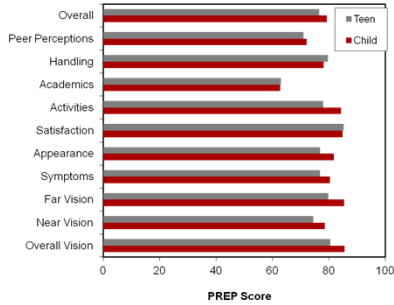
PREP Change
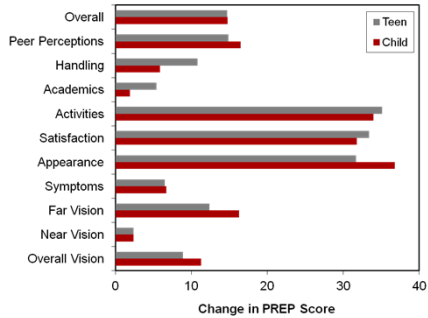
CLIP Conclusions

- I/R takes 10 minutes longer for children than teens
  - Not affect doctor's productivity
  - Doctor's can predict difficult patients
  - Staff time
- No biomicroscopic differences between children and teens
- CL care information should be reinforced for children

CLIP Conclusions

- Children and teens both benefit from contact lens wear
  - Appearance and activities main benefits
  - Most benefit occurs within one week

CLIP Conclusions

- *Don't use age as a criteria for contact lens fitting!!!*

ACHIEVE Study

- 59.5% female
- 10.4 ± 1.1 years
  - 8 years = 14%
  - 9 years = 21%
  - 10 years = 31%
  - 11 years = 34%
- Race / ethnicity
  - White = 47%
  - Black = 22%
  - Hispanic = 22%
  - Asian = 7%

Adolescent and Child Health Initiative to Encourage Vision Empowerment

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Contact Lenses

- For study
  - 93% chose daily
- If pay
  - 63% choose daily

- Etafilcon A
- 58% water
- dK 28.0

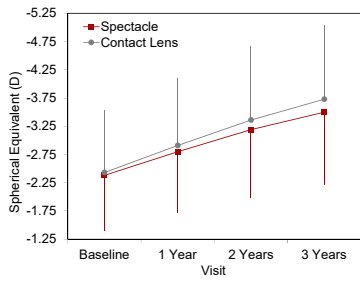| Etafilcon A Daily	Etafilcon A Bi-Weekly
Throw away daily	Throw away every 2 weeks
No solutions	"No rub" solutions
$360 per year	$260 per year
Fresh contact lenses daily	Fresh lenses every 2 weeks
No reminder to change lenses	Change 1st and 15th of month
Sold in US since 1995	Sold in US since 2001
Rx'd less often	Rx'd more often

Refractive Error MEAN ± SD

Axial Length MEAN ± SD
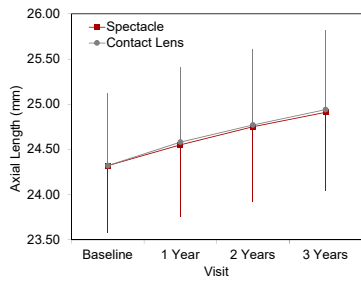
Primary Results
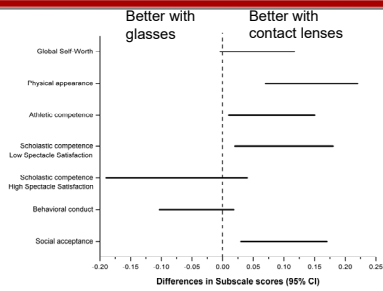
- Walline JJ, et al.. *OVS* 2009;86:222-32

ACHIEVE Results

- Soft contact lenses do not increase myopia progression
- Contact lens wear improves self-esteem
  - Physical appearance
  - Athletic competence
  - Social acceptance

CLASIC Study

- Purpose: to determine if fitting soft contact lenses at younger age leads to worse outcomes
- Soft contact lens wearers for 10 years
  - Fit ≤12 years old (child-fit) versus ≥13 years old (teen-fit)
    - Internet survey (n = 86 child-fit; n = 89 teen-fit)
      - Comfort, adverse events, compliance
    - Slit lamp examination (n = 30 child-fit; n = 30 teen-fit)

Demographics: Internet

	Child	Teen	p-value
% female	71	63	0.26
% white	83	76	0.35
% never smoked	95	92	0.54
CL power OD, D (mean ± SD)	−3.35 ± 3.85	−2.90 ± 3.57	0.43
CL power OS, D (mean ± SD)	−3.49 ± 3.87	−2.97 ± 3.53	0.35

Comfort

	Child	Teen	p-value
CL wear, D / wk (mean ± SD)	6.4 ± 1.0	6.4 ± 1.2	0.73
CL wear, h / d (mean + SD)	14.8 ± 3.4	14.7 ± 3.6	0.74
Comfortable CL wear, h / d (mean + SD)	13.7 ± 3.6	13.5 ± 4.6	0.73
Difference, h / d (mean + SD)	1.1 ± 2.5	1.2 ± 2.7	0.92
% wear CL as long as would like	78	76	0.86
Rating of CL (1=poor; 10=excellent)	8.5 ± 1.2	8.4 ± 1.2	0.67

Adverse Events

	Child	Teen	p-value
Eyes appeared more red with CL	36	36	1.00
Allergies worse with CL	22	17	0.45
Eyelids more "puffy" with CL	12	12	1.00
Painful red eye that required doctor visit	21	19	0.85

Swimming
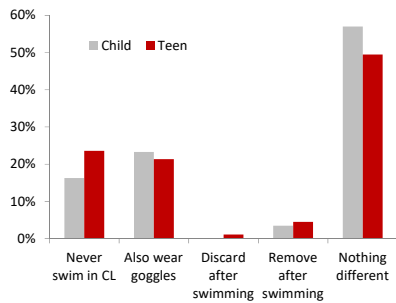
Solutions
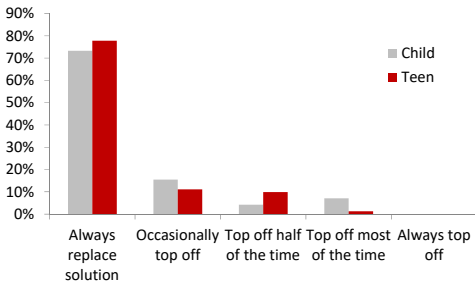
Replace Case
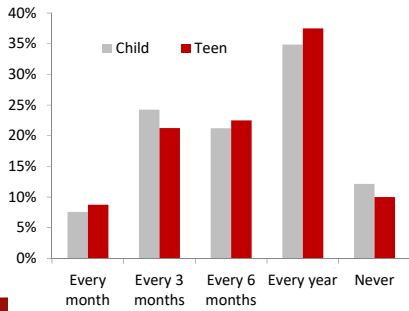
Demographics: Slit Lamp

	Child	Teen	p-value
% Female	77	63	0.40
% Dry Eye (CLDEQ)	20	30	0.55
CLDEQ score	+0.70 ± 0.60	+0.79 ± 0.67	0.60
VA (logMAR)	−0.06 ± 0.09 (6/6^{+3})	−0.04 ± 0.09(6/6^{+2})	0.45
Spherical Equivalent (D)	−4.30 ± 1.69	−2.87 ± 2.75	0.02
J$_0$ (D)	−0.06 ± 0.35	−0.03 ± 0.32	0.78
J$_{45}$ (D)	−0.15 ± 0.22	−0.10 ± 0.22	0.35
Steep keratometry (D)	44.00 ± 1.43	44.32 ± 1.27	0.59
Flat keratometry (D)	45.15 ± 1.63	46.37 ± 1.58	0.37

Soft Contact Lenses
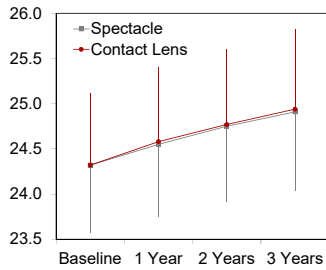
Compliance

	Child	Teen	p-value
Time since last exam, months (mean ± SD)	9.3 ± 9.7	9.5 ± 6.8	0.90
How easy to care and clean, initially (10=easy)	6.2 ± 2.7	6.6 ± 2.2	0.30
How easy to care and clean, now (10=easy)	9.3 ± 1.0	9.0 ± 1.3	0.12
How much easier to care and clean	3.1 ± 2.6	2.4 ± 2.5	0.08
Always wash hands before CL? (% yes)	36	43	0.44
Do you sleep in CL?	16	19	0.69

Lids and Conjunctiva

	Child	Teen	p-value
Blepharitis	0.3 ± 0.6	0.4 ± 0.7	0.53
Meibomian gland dysfunction	0.5 ± 0.7	0.5 ± 0.7	0.70
Papillary conjunctivitis	0.8 ± 0.8	0.9 ± 0.8	0.64
Conjunctival redness	0.7 ± 0.6	0.5 ± 0.6	0.20
Limbal redness	0.6 ± 0.5	0.4± 0.6	0.29
Conjunctival stain	0.9 ± 0.8	0.7 ± 0.8	0.43

Cornea

	Child	Teen	p-value
Vascularization	0.4 ± 0.5	0.2 ± 0.4	0.28
Epithelial microcysts	0.2 ± 0.5	0.1 ± 0.4	0.53
Mucin balls (#)	1.0 ± 3.5	0.6 ± 2.6	0.62
Central corneal thickness (μm)	562 ± 39	554 ± 37	0.42
Cell density (cells/mm^2)	3016 ± 366	3073 ± 327	0.53
Coefficient of variation	30.0 ± 4.9	29.9 ± 5.6	0.96

Corneal Staining

Child

0.3 ± 0.6

0.2 ± 0.6   0.1 ± 0.4   0.1 ± 0.3
Nasal

0.5 ± 0.8

Total sum stain = 1.1 ± 1.6

Teen

0.2 ± 0.6

0.2 ± 0.6   0.1 ± 0.6   0.2 ± 0.7
Nasal

0.5 ± 1.0

Total sum stain = 1.2 ± 2.8
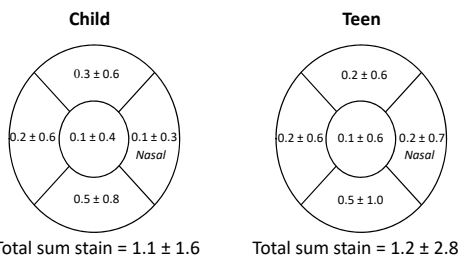
CLASIC Results

- Subject reports of CL care procedures similar if fit as child
- Subject report of adverse events similar if fit as child
- Higher myopia if fit as child
  - Not *caused* by fitting with CL
- No long-term ocular health consequences

Risks by Age

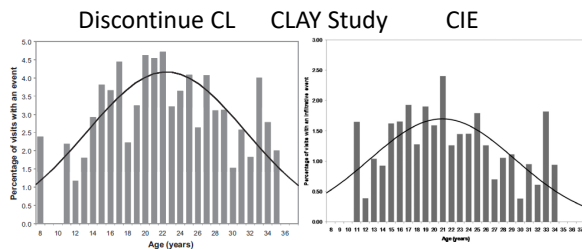Discontinue CL   CLAY Study   CIE

Wagner H, et al. OVS 2011;88: 973-80

Chalmers RL, et al. IOVS 2011;52:6690-96

Overall Message

Kids can wear contact lenses!!!