CONTACT LENSES AND YOUTH
HAVING FUN BUT STAYING SAFE

Heidi Wagner, OD, MPH

Disclosures

• Research
  – Alcon Research, Ltd.

• Clinical Education and Patient Care
  – Alcon Research Ltd.
  – Defined Health
  – Wink Productions
Trends in Contact Lens Wear

- **Refractive correction**
- **Myopia control**
- **Self-esteem and self-perception**
- **Decorative contact lens wear**

Adverse Events

- **Corneal inflammatory events**
  - Microbial keratitis (MK)*
  - Infiltrative keratitis (IK)
  - Contact lens associated red eye (CLARE) with or without corneal infiltrates
  - Contact lens peripheral ulcer (CLPU)
### Incidence of MK with CL wear in Adults

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<th>Author</th>
<th>DW Hydrogel</th>
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<td>Schein &amp; Poggio (1989)</td>
<td>4.1 (2.9-5.2)</td>
<td>20.9 (15.1-26.7)</td>
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<td>Cheng (1999)</td>
<td>3.5 (2.7-4.5)</td>
<td>20.0 (10.3-35.0)</td>
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<td>1.1 (0.6-1.7)</td>
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<td>Schein (2005)</td>
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<td>18.0 (8.5-33.1)</td>
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<td>Morgan (2005)</td>
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<td>0.2 (0.0-3.7)</td>
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<td>Stapleton (2008)</td>
<td><strong>1.9</strong> (1.8-2.0)</td>
<td><strong>19.5</strong> (14.6-29.5)</td>
<td><strong>11.9</strong> (10.0-14.6)</td>
<td><strong>25.4</strong> (21.2-31.5)</td>
<td><strong>1.2</strong> (1.1-1.5)</td>
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Summary slide by K. Richdale
Youth (<25 years)

- Contact Lens and Youth Study
- Orthokeratology
- Decorative contact lenses
- Emergency department visits

Current Study Group
- Kathryn Richdale, OD PhD FAAO
- Heidi Wagner, OD MPH FAAO
- Chandra Mickles, OD, MS, FAAO
- Beth Kinoshita, OD FAAO
- Dawn Lam, MSc OD FAAO
- Luigina Sorbara, OD MSc FAAO
- Aaron Zimmerman, OD MS FAAO
- G. Lynn Mitchell, MAS FAAO

Past members: Meredith Jansen, OD MS FAAO, Tim McMahon OD FAAO, Robin Chalmers OD, FAAO
CL Risk and Driving?

Average California Auto Insurance Rates, by Age and Sex

The gender gap becomes minimal past the age of 25


Optometry and Vision Science, Vol. 88, No. 8, August 2011

Risk Factors for Interruption to Soft Contact Lens Wear in Children and Young Adults

14,305 visits
3,549 soft CL wearers
522 events that interrupted CL wear

Peak: 20 to 22 years
Age and Other Risk Factors for Corneal Infiltrative and Inflammatory Events in Young Soft Contact Lens Wearers from the Contact Lens Assessment in Youth (CLAY) Study

Robin L. Chalmers,1 Heidi Wagner,2 G. Lynn Mitchell,3 Dawn Y. Lam,1 Beth T. Kinoshita,3 Meredith E. Janssen,1 Kathryn Richdale,5 Luigiina Sorbara,6 and Timothy T. McAlmon6

187 infiltrative and inflammatory events

Peak: 15 to 25 years

% of Enrolled Wearers in Age Group

- IBS
- Microbial keratitis
- CLARE w/inf
- CLARE w/rel
- CPFU
- Infiltrative keratitis

8 to 12
13 to 17
18 to 25
>26
Contact Lens Risk Survey

Contact Lens Wearer Demographics and Risk Behaviors for Contact Lens-Related Eye Infections — United States, 2014

Jennifer R. G weary, MD; Isaac A. Gelman, MPH; Maya M. Ela, MPH; Robin Utech, DDS; V. Lynn McDill, MD; Ashley Bouldin, DDS, MPH; I. David Homer, MD; Beth F. Kissack, OD; Don E. Lusk, OD; Luana N. Souto, OD; James Zimmermann, OD; Jonathan S. Yodo, MPH; Michael J. Resca, PhD

Contact lenses provide safe and effective vision correction for many Americans. However, contact lens wearers risk infection if they fail to wear, clean, disinfect, and store their contact lenses as directed. Over the past decade, CDC has investigated several multistate outbreaks of serious eye infections among contact lens wearers, including Acanthamoeba keratitis (1). Each investigation identified frequent contact lens hygiene-related risk behaviors among patients. To guide prevention efforts, a population-based survey was used to estimate the number of contact lens wearers aged 18 years in the United States. A separate online survey of contact lens wearers assessed the prevalence of contact lens hygiene-related risk behaviors. Approximately 95% of wearers reported at least one contact lens hygiene risk behavior. Nearly one third of contact lens wearers reported performing multiple hygiene-related risk behaviors.

Orthokeratology

Orthokeratology Lens-Related Corneal Ulcers in Children

A Case Series

Akio I. Watanabe, MSc; Alfonso J. L. Liew, FRCS; Lou L. Chang, BSc; Harry Y. K. Low, FRCS; Angus K. K. Wong, FRCS; Duncan L. C. Lam, FRCS, FRCOphth
The Risk of Microbial Keratitis With Overnight Corneal Reshaping Lenses

Mark A. Bullimore, Lesline T. Sinnott, and Lisa A. Jones-Jordan

Abstract

PURPOSE: To estimate the incidence of microbial keratitis (MK) associated with overnight corneal reshaping contact lenses and to compare rates in children and adults.

METHODS: A retrospective study of randomly selected practitioners, stratified by center volume and lens company, was conducted. Practitioners were invited to participate and those agreeing were asked to provide deidentified patient information for up to 50 lens orders and to complete a comprehensive overview form for any of these patients who had attended an unscheduled visit for a painful red eye. Duration of contact lens wear was calculated from the original fitting date or January 2005 (whichever was later) to when the patient was last seen by the practitioner wearing the lenses on a regular basis. Cases of MK were classified by majority decision of a 5-member expert panel.

RESULTS: For the 191 practitioners who could be contacted, 119 (62%) agreed to participate. Subsequently, 11 withdrew, 22 did not respond, and 86 (43%) returned completed forms corresponding to 2302 lens orders and 1494 patients. Limiting the sample to those patients with at least 3 months of documented contact lens wear generated 1374 adults (64%) and 677 children (51%). Representing 2959 patient-years of wear (adults = 1154; children = 1435). Eight events of corneal infiltrates associated with a painful red eye were reported (six in children and two in adults). Two were classified as MK. Both occurred in children but neither resulted in a loss of visual acuity. The overall estimated incidence of MK was 7.7 per 10,000,000 years of wear (95% confidence interval [CI] = 0.9 to 27.9). For children, the estimated incidence of MK is 13.9 per 10,000 patient-years (95% CI = 1.7 to 50.4). For adults, the estimated incidence of MK is 0.6 per 10,000 patient-years (95% CI = 0 to 31.7).

CONCLUSIONS: The risk of MK with overnight corneal reshaping contact lenses is similar to that with other overnight modalities. The fact that the CIs for the rates estimated overlap should not be interpreted as evidence of no difference. True differences fewer than 50 cases per 10,000 patient-years were beyond the study's power of detection.

Decorative Contact Lenses

Ocular complications associated with the use of cosmetic contact lenses from unlicensed vendors.

Abstract

PURPOSE: To call attention to the unauthorized sale of cosmetic contact lenses, resulting in ocular complications. DESIGN Observational case report.

METHODS: Retrospective, observational clinical practice setting.

RESULTS: Ocular complications include abrasions, conjunctivitis, corneal neovascularization, corneal infiltrates, and corneal edema. A total of 871 subjects (1,742 eyes) were evaluated. 25 clinical investigators participated in the study, with an average completion rate of 36%. The mean age of the patients was 26.8 ± 6.8 years, and 80% of participants were female. The total number of adverse events across all studies was 285 visits by eye (1,129 visits by patient). There were no adverse events that grade 2 or greater for any finding. Conclusion: The cosmetic contact lenses evaluated in this meta-analysis appear to be safe when properly prescribed by an eye care professional and used in a compliant manner.

CONCLUSION: The cosmetic contact lenses evaluated in this meta-analysis appear to be safe when properly prescribed by an eye care professional and used in a compliant manner.
Emergency Department Visits for Medical Device-Associated Adverse Events Among Children
Cunlin Wang, Brock Heiflin, Judith U. Cope, Thomas P. Gross, Mary Beth Ritchie, Youlin Qi and Jianxiong Chu

RESULTS: The total estimated number of pediatric MDAEs during the 24-month period was 144,799 (95% confidence interval: 113,051–183,903), involving devices from 13 medical specialties. Contact lenses accounted for most MDAEs (23%), followed by hypodermic needles (8%). The distribution of MDAEs according to medical specialty varied according to age subgroup. The most-prevalent types of injuries included contusions/abrasions, foreign-body intrusions, punctures, lacerations, and infections. The most-frequently affected body parts were

Strategies for success

• Modifiable risk factors*
• Non-modifiable risk factors
Modifiable

- Closed eye wear
- Lens replacement ("Pantry Effect")
- Lens care
- Case care and replacement
- Water exposure
- Multipurpose versus oxidative (H$_2$O$_2$)
- Back-up spectacles
- Periodic follow-up

Non-modifiable

- Age
- High refractive error
- Systemic health
- Predisposition for risk-taking
Targeted Patient Education

- College Students (older teens, young adults, away from the family home
  - Unique lens wearing behaviors
  - Environmental exposures
  - Benefit from anticipatory guidance

Putting It Into Practice

- Keep current with best practices
- Educate, educate, and then re-educate!
- Voluntary reporting
American Optometric Association

http://www.contactlenssafety.org/

CDC Healthy Lenses Program

www.cdc.gov/contactlenses
Back-to-school Programs

Children & Younger Adolescents

- **New quarters, new case**
  - Replacing your contact lens case every three months will help keep germs at bay. To reduce the risk of eye infection by 90%.

- **Just say no to H2O**
  - You may be captain of the swim team, but you shouldn’t swim, shower or go in a hot tub wearing contact lenses. Water from the tap might be clean enough to drink or bathe in, but it’s still home to the parasite Acanthamoeba, which can cause severe eye infections resulting in vision loss. For the same reasons, do not use water to clean or soak contact lenses or cases.

- **You snooze, you lose**
  - Don’t ever sleep in your contact lenses. The same Ophthalmology study also found that even occasional sleeping in contact lenses increases the risk of moderate to severe eye infection by 6.5 times.

- **It’s too late if you wait**
  - Symptoms of eye infections include redness, pain and light sensitivity, and should be

Older Adolescents & Young Adults

Focus Campaigns

- Halloween and other decorative contact lenses
- Orthokeratology
Halloween

'Colored' and Decorative Contact Lenses: A Prescription Is A Must

Wouldn't it be cool to have vampire eyes for Halloween? Or deep violet eyes to match your purple sweatsuit? How about your favorite sports team’s logo on your eyes just for fun?

You can have all of these looks with decorative contact lenses (sometimes called "fashion," "costume," or "colored" contact lenses). These lenses don’t correct vision—they just change how your eyes look.

https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm275069.htm

Orthokeratology

The "No Water Campaign"

A campaign was launched in 2011 to raise awareness of the risks associated with using non-sterile water to clean contact lenses. Established by renea kikuchi, who lost the sight in her right eye after contracting a corneal infection called Acanthamoeba keratitis, the No water Initiative won Campaign of the Year at the Inaugural awards ceremony in London June 2016.

In the video below, renea kikuchi talks about her successful "no water warning" campaign to help raise awareness of a disease that can affect people who wear contact lenses.

http://www.paragonvision.com/consumer/you-and-crt/no-water-on-lenses
Reinforcing the Message

• "Apps"
• Social media
• Periodic “well visits”

MedWatch (Adverse Events)

Download the MedWatcher Mobile App
• iTunes Store: MedWatcher App Download
• Google Play Store: MedWatcher App Download
Resources
http://u.osu.edu/wagner.10

Contact Lens Safety Site (American Optometric Association) http://www.contactlenssafety.org/

Decorative Contact Lenses (Food and Drug Administration) https://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/HomeHealthandConsumer/ConsumerProducts/ContactLenses/ucm270953.htm

Healthy Contact Lens Habits (American Optometric Contact Lens Educators) http://www.aocle.org/

Healthy Contact Lens Wear and Care (Centers for Disease Control and Prevention) https://www.cdc.gov/contactlenses/cdc-at-work.html

MedWatch (Food and Drug Administration Safety Information and Adverse Event Reporting Program) http://www.fda.gov/Safety/MedWatch/

Patient Handout: Don’t Be Casual with Your Contact Lenses. (Centre for Contact Lens Research, School of Optometry & Vision Science, University of Waterloo) http://contactlensupdate.com/2015/08/26/patient-handout-dont-be-casual-with-your-contact-lenses/