

Contact Lens Update for the Modern Optometric Practice

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Disclosures

Dr. Wood:

- **LKC Technologies** – Clinical Advisory Board
- **Alcon** – Contact Lens KOL/Speaker
- **Bausch & Lomb** – Contact Lens Expert/Speaker
- **Essilor Instruments** – LLLT/IPL Speaker
- **Euclid Vision Group** – Speaker/Consultant
- **Orasis Pharmaceuticals** – Speaker/Consultant
- **Pure & Clean** – Research/Speaker
- **Vision Source Administrator** – San Antonio
- **Vision Source Vendor Relations Consultant** – Equipment/Contact Lens

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Learning Objectives

Technology & Selection

- Describe soft and specialty lens advances
- Select lenses for common and complex cases
- Apply evidence-based myopia management

Health & Success

- Identify and manage CL complications
- Optimize the ocular surface
- Improve satisfaction, compliance, retention

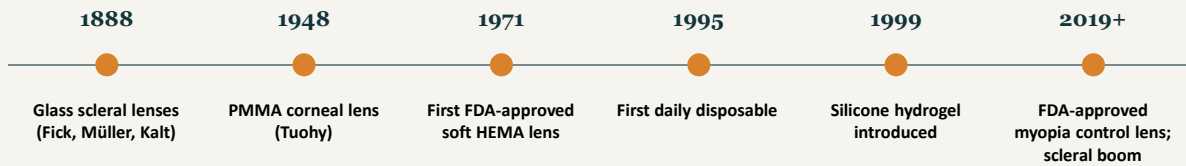
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The Modern Contact Lens Practice

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Innovation Timeline



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Current Prescribing Trends

- **Silicone hydrogel dominates soft fits**
- **Daily disposables lead new fits**
- **Torics and multifocals remain under-prescribed**
- **Specialty and myopia segments growing fast**

SiHy

the dominant soft lens material

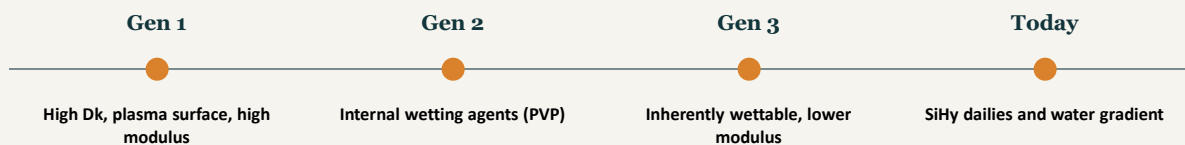
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Growth of Daily Disposables

- No cases or solutions to mismanage
- Fresh lens surface every day
- Lower deposit and allergy burden
- Ideal for kids, part-time, and allergy wearers

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Silicone Hydrogel Evolution



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Patient Expectations and Practice Opportunities

Patients now expect

- All-day comfort, even on screens
- Clear vision at every distance
- Subscriptions and home delivery
- Transparent value

Opportunities

- Presbyopia: largest underserved group
- Myopia management as a recurring service
- Specialty lenses differentiate the practice
- Annual supply plans boost retention

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Advances in Soft Lens Technology

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Silicone Hydrogel Developments

- Siloxane delivers oxygen
- Hydrophilic monomers deliver water and comfort
- Balance Dk, wettability, modulus, lipids
- Newer surfaces resist lipid deposition

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Water Gradient Technology

- SiHy core with near-100% water surface
- Soft, lubricious, low-friction interface
- Daily: delefilcon A
- Monthly: lehfilcon A

~100%

water content at outer surface

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Surface Treatments and Wettability

Approaches

- Plasma oxidation and coatings
- Internal wetting agents
- Moisture-release agents
- Biomimetic polymer surfaces

Clinical goals

- Stable pre-lens tear film
- Lower friction
- Less lipid and protein deposition
- Comfort late in the day

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Oxygen Transmissibility Benchmarks (Dk/t)

24 Dk/t

Daily wear, no edema
(Holden-Mertz)

87 Dk/t

Overnight wear, limit edema
(Holden-Mertz)

125 Dk/t

Prevent overnight stromal anoxia
(Harvitt-Bonanno)

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Modulus: Choosing the Right Stiffness

Lower modulus

- **Better comfort**
- **Fewer SEALS and CLPC**
- **Harder to handle**
- **Less astigmatism masking**

Higher modulus

- **Easier handling**
- **Masks small cylinder**
- **More mechanical events**
- **Edge awareness**

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Blue Light Reduction and HD Optics

Blue / HEV filtering

- HEV-filtering options
- Glare and light-sensitivity benefits
- Limited evidence for strain or retinal protection
- Set realistic expectations

Spherical aberration control

- Offsets positive spherical aberration
- May improve contrast
- Most helpful with large pupils
- Useful for low-light complaints

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Soft Lens Designs at a Glance

Design	Key features	Clinical pearl
Spherical	Aspheric optics, better centration	Refine with SA control if needed
Toric	Prism, peri-ballast, eyelid-stabilized	Fit at 0.75 D cylinder or more
Multifocal	Center-near aspheric, zonal	Follow the fitting guide!!
Toric multifocal	Now in disposable formats	Correct cylinder to win near
EDOF	Higher-order aberration control	Good for early presbyopes
Custom	Lathe-cut, unlimited parameters	High Rx, irregular, pediatric

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Toric and Multifocal Fitting Pearls

- Use LARS for rotation compensation
- Over-refract in normal room light
- Binocular over-refraction in +/-0.25 D steps
- Limit to two changes before switching design

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Daily Disposable Innovations

Benefits and compliance

- No case or solution contamination
- No solution toxicity
- Fewer allergic and papillary reactions
- Removes over-wear temptation

Best candidates

- New and young wearers
- Part-time and sports wearers
- Allergy and dry eye patients
- Chronic replacement stretchers

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Specialty Contact Lenses

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Corneal and Scleral GP Indications

Irregular corneas

- Keratoconus and other corneal ectasia
- Post-RK, post-LASIK ectasia
- Post-PK, trauma, scarring

Ocular surface disease

- Graft vs Host Disease (GVHD)
- Sjögren's Syndrome
- Stevens-Johnson Syndrome (SJS)
- Neurotrophic Keratitis
- Exposure keratopathy

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Scleral Lens Fitting Targets

**200-300
μm**

Central clearance after settling

360°

Limbal clearance

Aligned

Landing zone, no blanching

Toric Haptic 1.50 D

Most scleras are not spherical, will help decrease lens fogging due to tear film leakage under the lens

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Keratoconus and Post-Surgical Patients

- **Keratoconus: corneal GP, hybrid, or scleral**
- **Post-refractive: reverse geometry or scleral**
- **Post-PK: high Dk, minimal vault, watch ECC**
- **Post-CXL: refit after stabilization**

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Fitting Technology

- **Corneal topography and tomography**
- **Anterior segment OCT for clearance**
- **Scleral profilometry for toric haptics**
- **Impression-based and free-form designs**

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Hybrid Lenses

Indications and applications

- Mild to moderate keratoconus
- Irregular astigmatism
- GP-intolerant patients
- Multifocal hybrid options

Advantages and cautions

- GP optics, soft comfort
- Excellent centration
- Watch hypoxia and tight lens
- Inspect junction for tears

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Custom Soft Lenses

- High astigmatism beyond disposables
- Irregular corneas in GP-intolerant patients
- Pediatric aphakia
- High anisometropia and amblyopia

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Orthokeratology

Benefits

- Freedom from daytime correction
- Ideal for sports and active kids
- Slows axial elongation
- Topography-guided design software

Limitations

- Overnight wear keratitis risk
- Cost and commitment
- Best for low to moderate myopia
- Regression if wear stops

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Ortho-K Patient Selection

- FDA cleared for Myopia -1.00 to -5.00 D (-6.00 in certain systems)
- WTR astigmatism up to 1.50 D (peripheral toric designs extend to -3.50D)
- Motivated family with good hygiene
- Normal corneal topography

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Contact Lenses for Myopia Management

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Why Myopia Management Matters

~50%

Global myopia prevalence projected by 2050
(Holden 2016)

58%

Higher maculopathy risk per diopter
(Bullimore 2019)

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Evidence Supporting Myopia Control

Modality	Key evidence	Effect
Dual-focus soft (MiSight 1 day)	3-yr RCT, Chamberlain 2019	~59% refraction, ~52% axial slowing
High-add multifocal (+2.50)	BLINK, Walline 2020	Slower progression vs single vision
Orthokeratology	Multiple meta-analyses	~40-50% axial slowing

Options for Myopia Management

Modality	Key design technology	Available
Multifocal with paracentral defocus (Be Free Day sphere)	Technology from Brien Holden Vision	Now, FDA Cleared
Multifocal toric with paracentral defocus BeFreeDay Toric)	Technology from Brien Holden Vision	Fall 2026, FDA cleared June 2026
EDOF (Naturalvue)	Uses EDOF design for far/near focus	Now, FDA Cleared

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Myopia Control vs. Myopia Management

Myopia control

- The intervention itself
- Optical or pharmacologic
- Focused on slowing growth

Myopia management

- Comprehensive long-term care model
- Treatment plus monitoring
- Lifestyle: outdoor time, near work
- Counseling and treatment adjustment

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How Dual-Focus and Multifocal Designs Work

- **Peripheral myopic defocus slows eye growth**
- **Concentric treatment zones**
- **Higher add outperforms lower add**
- **Ortho-k creates similar peripheral defocus**
- **Brien Holden Vision Institute Parafoveal Defocus**

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Candidate Selection and Monitoring

Good candidates

- Early onset, documented progression
- Parental myopia
- Typically ages 6-12
- Motivated child and parent

Monitoring success

- Axial length every 6 months
- Cycloplegic refraction
- Compare to growth percentile charts
- Escalate for poor responders

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Counseling Patients and Parents

- **Goal is slowing, not stopping**
- **Treatment continues through the teens**
- **Discuss risks, benefits, and fees**
- **Document informed consent for off-label use**

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Ocular Surface Optimization

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*“Discomfort remains the leading reason patients
discontinue contact lens wear.”*

— TFOS International Workshop on Contact Lens Discomfort, 2013

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Dry Eye Evaluation

Glands and tear film

- MGD: expression, meibography
- NIBUT and osmolarity
- Tear meniscus height
- Fluorescein and lissamine staining

Lids and inflammation

- Blepharitis and Demodex collarettes
- Lid wiper epitheliopathy
- MMP-9 testing
- Conjunctival hyperemia

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Improving Contact Lens Success

Home therapy

- Preservative-free tears, rewetting drops
- Warm compresses and lid hygiene
- Hypochlorous acid sprays and drops
- Omega-3s: mixed evidence (DREAM)

Prescription and in-office

- Cyclosporine, lifitegrast, short steroid
- Lotilaner for Demodex
- Perfluorohexyloctane for evaporative DED
- Thermal pulsation, IPL, BlephEx

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Lens Selection for Dry Eye Patients

Daily disposable

- Water gradient or
- high-wettability SiHy
- Fresh surface daily
- Mild to moderate dry eye

Scleral GP

- Liquid bandage reservoir
- Moderate to severe OSD
- GVHD, Sjögren's, exposure

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Complications and Management

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Inflammatory Events

Event	Key signs	Management
CLARE	Red eye on waking, small peripheral infiltrates	Remove lenses; resolves; avoid sleeping in CLs
CLPU	Round peripheral infiltrate, focal staining	Discontinue; antibiotic +/- steroid
Sterile infiltrates	Small, peripheral, minimal pain	Discontinue; refit to dailies

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Infectious Keratitis: Risk and Recognition

Risk factors

- Overnight wear (about 5x risk)
- Water exposure
- Poor case hygiene
- Smoking, online purchase

Red flags

- Central or >1 mm infiltrate
- Epithelial defect and AC reaction
- Pain out of proportion: Acanthamoeba
- Feathery margins: fungal

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Initial Management and Referral

Initial management

- Culture per 1-2-3 rule
- Intensive fluoroquinolone
- Culture lens and case
- Re-check in 24 hours

Refer when

- Suspected Acanthamoeba or fungal
- Visual axis threatened
- Impending perforation
- No response in 24-48 hours

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Hypoxia-Related Changes

- Microcysts and stromal edema
- Limbal hyperemia and neovascularization
- Endothelial polymegathism
- Fix: higher Dk material, less wear time

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Mechanical Complications

Complication	Cause	Management
SEALs	High modulus, tight upper lid	Lower modulus or new design
CLPC	Deposits, mechanical, immune	Pause wear; mast cell/steroid; refit dailies
Edge complications	Poor edge, diameter mismatch	Adjust diameter and edge design

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The Compliance Gap

>85%

of wearers report at least one non-compliant behavior

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Patient Education Essentials

- Replace on schedule; use app reminders
- Wash hands; rub, rinse; replace case monthly
- No sleeping in lenses unless prescribed
- No tap water, swimming, or showering

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VII

Clinical Pearls and Case Studies

7 minutes

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Case 1: Multifocal Fitting Success

- 52-year-old, -0.25 D, add +2.00
- Center-near daily multifocal per guide
- Binocular tweaks in room light
- Result: reading without readers

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Case 2: Difficult Toric Fit

- -3.00 -2.50 x 160, rotating 15° nasally
- LARS compensation, new axis ordered
- Switched stabilization design
- Custom soft if instability persists

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Case 3: Scleral Lens Management

- Keratoconus patient with midday fogging
- Checked landing and vault on OCT
- Toric haptics from profilometry
- High-viscosity fill; fogging resolved

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Case 4: Dry Eye Rehabilitation

- 34-year-old drops out after 4 hours
- Treated MGD and Demodex first
- Refit into water-gradient daily
- Now wearing 12 comfortable hours

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Case 5: Myopia Management

- 9-year-old, -2.00 D, AL +0.4 mm/year
- Both parents myopic
- Started dual-focus daily lens
- Axial growth slowed at 12 months

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Case 6: Managing the Noncompliant Patient

- 22-year-old sleeping in monthlies
- Presented with CLPU
- Nonjudgmental education, refit to dailies
- Documented informed risk discussion

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Summary

- Technology keeps improving vision and comfort
- Patient selection remains critical
- Ocular surface health drives long-term success
- Myopia management is now core practice
- Evidence-based care grows outcomes and practice

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Thank You!

Questions?

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