

TRICKS AND TIPS FOR SUCCESSFUL THERAPEUTIC SCLERAL LENS WEAR IN OCULAR SURFACE DISEASE


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Disclosures

- ABB
- Aculens
- Adren Optical
- Alcon
- Allegan
- Anthem, INC
- Bausch + Lomb
- CoStarinc
- CooperVision
- Essilor, Contacts
- Johnson & Johnson Vision
- Gas Permeable Lens Institute (GPLI)
- Novartis
- Quora
- Pangon Biotech
- Phoropt
- Science Based Health
- Scleral Lens Education Society
- Shro
- Singer's Syndrome Foundation
- STABLE program
- Walmart
- Wetlabs Technologies

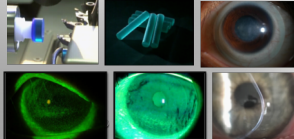
SCLERAL LENSES

- FIRST USED IN LATE 1800S AND EARLY 1900S
- MANUFACTURING PROCESS NOW MORE REPRODUCIBLE
- MODERN SCLERAL LENSES
 - DON EZEKIEL, OD
 - KEN FULLUM, OD
 - PERRY ROSENTHAL, MD



MAJOR INDICATIONS OF SCLERAL LENSES

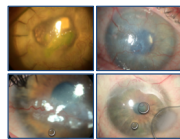
- VISION REHABILITATION
- OCULAR SURFACE DISEASE MANAGEMENT
- PAIN ATTENUATION



Thomas, Charles. Eye Rx Made Simple. St. Louis, MO: Elsevier; 2014.

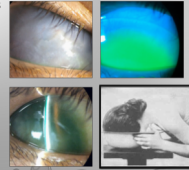
Therapeutic Scleral Lens Indications

- Neurotrophic Keratitis
- Exposure Keratitis
- Dry Eye Syndrome
- Graft vs Host Disease
- Steven Johnson Syndrome
- Ocular Cicatricial Pemphigoid
- Chemical Burns
- Limbal Stem Cell Failure
- Sjogren's Syndrome
- Persistent Epithelial Defect
- S/P Ocular Trauma
- Corneal Dystrophies
- Grave's ophthalmopathy



SCLERAL LENSES: AN ADJUNCTIVE THERAPY

- OCULAR PROTECTION AND CONTINUOUS LUBRICATION
 - PREVENT MECHANICAL DAMAGE
 - PREVENT TISSUE DESICCATION
 - PROMOTE HEALING
 - DISRUPT THE PAIN CYCLE
 - CORNEAL HYDRATION



Obituary—Rigid contact lenses

contact lens & ANTERIOR EYE
The Journal of the British Contact Lens Association

Nathan Efron 
Institute of Health and Biomedical Innovation and School of Optometry, Queensland University of Technology, 60 Musk Avenue, Kelvin Grove, Queensland 4059, Australia

- "Scleral and corneal rigid lenses represented 100% of the contact lens market immediately prior to the invention of soft lenses in the mid-1960s."
- In the United Kingdom today, rigid lenses comprise 2 per cent of all new lens fits.
- The 1998 prediction of the author that rigid lenses would be obsolete by the year 2010 has essentially turned out to be correct.
- Rigid lenses are now being fitted by a minority of practitioners with specialist skills/training.
- "Certainly, rigid lenses can no longer be considered as a mainstream form of contact lens correction."

Contact Lens & Anterior Eye **BCLA**

Andrew Gasson

... "New fittings are indeed very much a specialist, minority area but there still remain around the world large numbers of perfectly successful hard lens wearers supported by numerous equally successful hard lens laboratories".

- Andrew Gasson

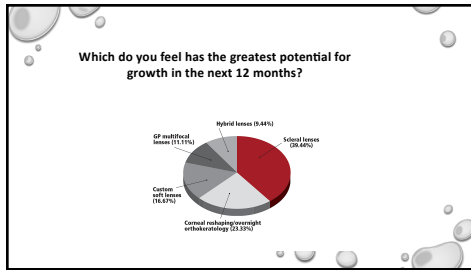
GP ANNUAL REPORT

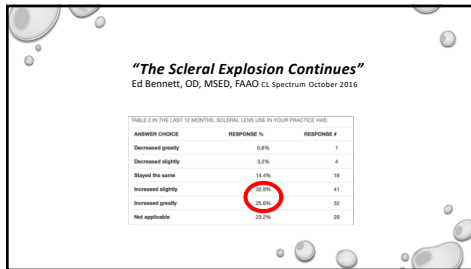
GP Annual Report 2015

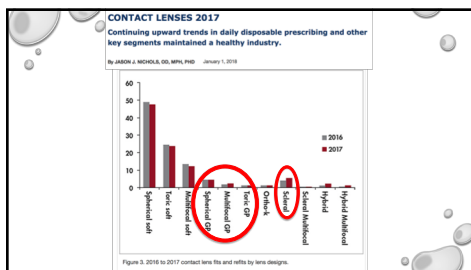
Scleral, multifocal, and other specialty designs continue to trend up in the GP lens market.

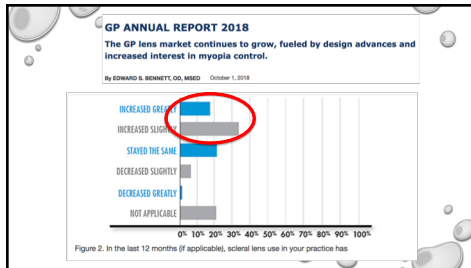
By Edward S. Bennett, OD, MSED, FAAO

UV While the GP con- This article will also present data from Contact Lens Spectra's lens an-









Lens Type	Description	Definition of Drifting Lens
Concave		Lens rests entirely on the cornea.
Concave-scleral		Lens rests partly on the cornea, partly on the sclera.
Scleral	Mini-Scleral	
	Lens fit up to 4mm (larger than DFSD)	Lens rests entirely on the sclera.
	Large Scleral	
	Lens fit more than 4mm (larger than DFSD)	


Scleral | Scleral Lens Education System
www.scleralens.org

TFOS DEWS II REPORT

"MULTIFACTORIAL DISEASE OF THE OCULAR SURFACE CHARACTERIZED BY A LOSS OF HOMEOSTASIS OF THE TEAR FILM AND ACCOMPANIED BY OCULAR SYMPTOMS, IN WHICH TEAR FILM INSTABILITY AND HYPER-OSMOLARITY, OCULAR SURFACE INFLAMMATION AND DAMAGE, AND NEUROSENSORY ABNORMALITIES PLAY ETIOLOGICAL ROLES."

DEWS II DRY EYE PREVALENCE

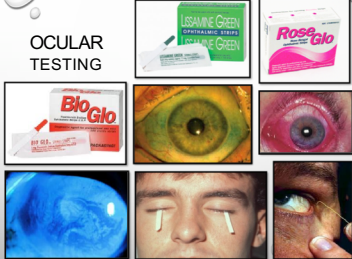
- DED PREVALENCE FOR STUDIES INVOLVING SYMPTOMS WITH OR WITHOUT SIGNS 5% TO 50%
- UP TO 75% FOR STUDIES BASED PRIMARILY ON SIGNS (HIGHER AND MORE VARIABLE RATES)
- REVIEW OF 437 PREVALENCE STUDIES
- PREVALENCE OF DED FROM 24 LARGE STUDIES




DEWS II DRY EYE PREVALENCE

- PREVALENCE IS MUCH HIGHER AMONG WOMEN
- AGING IS A RISK FACTOR
- SEX HORMONES ARE KEY FACTORS
- CHANGING HORMONE LEVELS / DECREASED ANDROGENS ARE CONTRIBUTORY

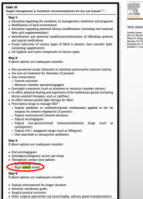
OCULAR TESTING



- "INCREASING APPRECIATION THAT DAILY WEAR OF A RIGID GAS PERMEABLE SCLERAL LENS MAY PLAY AN IMPORTANT ROLE IN THE MANAGEMENT OF MODERATE TO SEVERE DED."
- THE USE OF SCLERAL LENSES FOR OSD IS MORE WIDELY REPORTED IN A VARIETY OF REVIEWS.

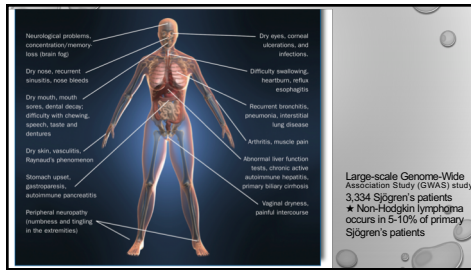


- CLINICAL STUDIES REPORT SUCCESS IN THE MANAGEMENT OF DED WITH SCLERAL LENSES, MINI-SCLERAL LENSES AND PROSE DEVICES.

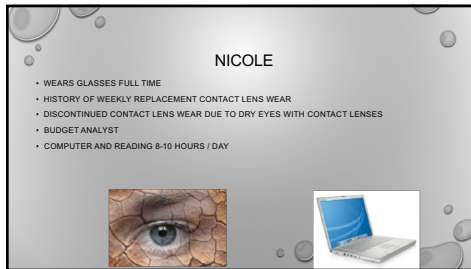


NICOLE

- 50 YEAR OLD CAUCASIAN FEMALE
- INTERESTED IN CONTACT LENSES FOR FULL TIME WEAR
- HISTORY OF SJÖGREN'S SYNDROME
- DRY MOUTH
- OCULAR FOREIGN BODY SENSATION
- INTERMITTENT RED EYES



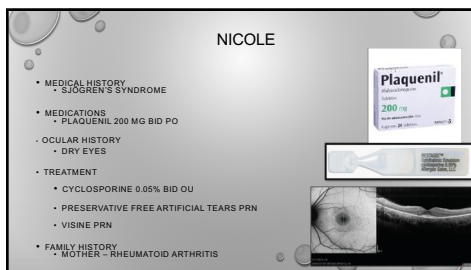
Large-scale Genome-Wide Association Study (GWAS) study
 3,334 Sjögren's patients
 * Non-Hodgkin lymphoma occurs in 5-10% of primary Sjögren's patients



NICOLE

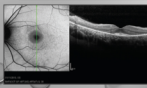
- WEARS GLASSES FULL TIME
- HISTORY OF WEEKLY REPLACEMENT CONTACT LENS WEAR
- DISCONTINUED CONTACT LENS WEAR DUE TO DRY EYES WITH CONTACT LENSES
- BUDGET ANALYST
- COMPUTER AND READING 8-10 HOURS / DAY



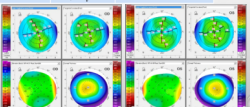



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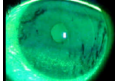
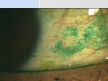
- MEDICAL HISTORY
• SJÖGREN'S SYNDROME
- MEDICATIONS
• PLAQUENIL 200 MG BID PO
- OCULAR HISTORY
• DRY EYES
- TREATMENT
• CYCLOSPORINE 0.05% BID OU
• PRESERVATIVE FREE ARTIFICIAL TEARS PRN
• VISINE PRN
- FAMILY HISTORY
• MOTHER - RHEUMATOID ARTHRITIS




OD	VA (glasses)	OS
20/20	20/20-2	
43.10 / 44.00 / 106	43.10 / 44.00 / 083	
-4.75 20/20	Refraction	-5.50 20/20
542	Pachymetry	532
18 mmHg	IOP tonopen @ 3-42pm	18 mmHg




OD	L/L	OS
2+ mgd, irregular lid margins	2+ mgd, irregular lid margins	
Trace hyperemia, 2+ NaF stain nasal and temp	Conj	Trace hyperemia, 3+ NaF stain nasal and temp
1+ nasal and temp LG stain	Cornea	3+ nasal and temp LG stain
Trace inferior PEK		3+ inferior PEK at 6:00 and 3:00
Trace endopigment inferior paracentrally		Trace endopigment inferior paracentrally
Deep and Quiet	A/C	Deep and Quiet
Clear	Lens	Clear
0.15	C/D	0.15
Normal	Macula	Normal
Normal	Peripheral Retina	Normal

TREATMENT



- SJOGREN'S SYNDROME FOUNDATION INFORMATION
- OCT OF MACULA AND 10-2 HUMPHREY VISUAL FIELD
- CONTINUE CYCLOSPORINE 0.05% BID OU
- NON-PRESERVED ARTIFICIAL TEARS QID OU / PRN
- LUBRICANT OINTMENT QHS OU / PRN
- GOOD WATER INTAKE
- HYDROEYE OMEGA FATTY ACIDS
- DISCUSSED MOISTURE GOGGLES
- AVENOVA EYELID CLEANER BID OU FOR TWO WEEKS, THEN DAILY OU
- WARM COMPRESSES (VARIOUS OPTIONS DISCUSSED)

OD	Scleral Lenses	OS
Clear distance and near vision	Vision Good	AWT 12 hours WTT 5 hours
Good	Comfort	Good
Scleral Aspheric Multifocal 41.00 / -2.00 / 16.4 / 9.2 Flatter PCs Sag 4.55	Parameters	Scleral Center Progressive Multifocal 42.00 / -3.25 / 16.4 / 9.2 Flatter PCs Sag 4.58
20/20-2 J2	VA Binoc 20/15+1 J1	20/20 J1
Piano	SOR	Piano
Good central apical clearance Good peripheral fit No blanching	Fit	Good central apical clearance Good peripheral fit No blanching

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CHAPTER 4

Scleral Lenses for the Regular / Normal / Non-Diseased Cornea

Luigi Nishida
Joshi D'Souza, et al. | University of Waterloo (Quebec, Canada)

Table 3. A summary of the wide range of multifocal scleral lenses that are available.

Type	Design	Power Range	Add Range	Diameter	Base Curve
Academy Matrix, Comfort II, Easy Fit	Center near Center distance	20.00 to 20.00 to 20.00 to -1.00D -1.00D	14.5 to 20.5 Dms	Custom	Custom
Art Optical: Anysize	Center near	Custom	-1.00 to -1.50D to -1.50D	16.5mm, 16.5mm, 17.5mm	6.04 to 8.44mm
Art Optical: Optima Sclera: SO, Clear	Center near	-20.00 to 20.00 to 20.00 to -1.00D to -1.50D range	-1.00 to -1.00 to -1.50D range	17.5 Dms	5.53-9.00 Dms
Advanced Vision Technologies: SVT	Center distance	Custom	Custom	Custom	Custom
Bluebird: Clarity 2.0	Center near	-20.00 to 20.00 to 20.00 to -1.00D to -1.50D range	14.4-13.2mm 14.4-13.2mm 14.4-13.2mm	6.80-9.00mm	Custom
Envision Optics: Plus	Center distance	10.00 to 20.00 to 20.00 to -1.75D	19 to 15-18 Dms	Custom	Custom
EyeFit: ProSclera	Center distance	Custom	Custom	Custom	Custom

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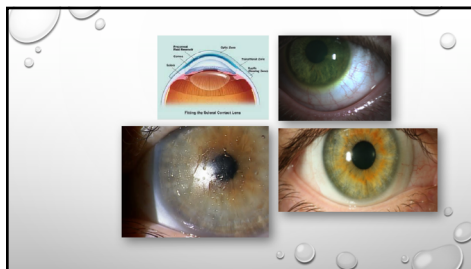
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Envision Optics: Plus	Center distance	10.00 to 20.00 to 20.00 to -1.75D	19 to 15-18 Dms	Custom	Custom
EyeFit: ProSclera	Center distance	Custom	Custom	Custom	Custom

DEBRIS AND DRY EYE

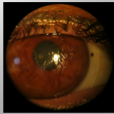
EVEN IN CASES OF SEVERE DRY EYE, STAINING SHOULD BE **LESS** AFTER SCLERAL LENS WEAR.



The image is a composite of four parts. Top left: A diagram showing a cross-section of an eye with a scleral lens fitting over the cornea and iris. Labels include 'SCLERAL LENS', 'CORNEA', 'IRIS', and 'PUPIL'. Below the diagram is the text 'Fitting the Scleral Contact Lens'. Top right: A photograph of a green eye showing a white, irregular stain on the cornea. Bottom left: A photograph of a brown eye showing a large, dark, circular stain on the cornea. Bottom right: A photograph of a green eye showing a white, irregular stain on the cornea.

POOR SURFACE WETTABILITY


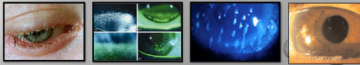
- DECREASES VISION
- DIMINISHES LENS COMFORT
- INCREASES CHAIR TIME
- INCREASES PATIENT COSTS



The image shows a close-up of an eye with a scleral lens. The lens surface is heavily stained with a dark, irregular pattern, indicating poor wettability and debris accumulation.



PATIENTS AT RISK

- OCULAR SURFACE DISEASE
 - OCULAR ROSACEA
 - MGD
 - FILAMENTARY KERATITIS
- EXCESSIVE LIPIDS IN THE TEAR FILM CREATE A FOGGY, HYDROPHOBIC LENS SURFACE



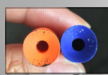

PATIENTS AT RISK

- EXPOSURE
 - PTOSIS
 - STROKE / NERVE PALSY
 - EYELID REPAIR

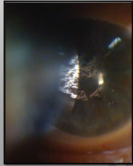


EXTERNAL CAUSES

- POOR PLUNGER HYGIENE
- MAKEUP/SKINCARE REGIME (OIL-BASED PRODUCTS)
- HAND SOAPS WITH MOISTURIZING AGENTS
- OLDER BLOCKING COMPOUNDS SUCH AS PITCH
- MECHANICAL IRRITATION
- ALLERGIC OR TOXIC REACTION
- MANUFACTURING DIFFICULTY

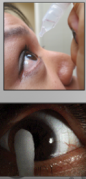


PREVENTING AND MANAGING POOR SURFACE WETTABILITY



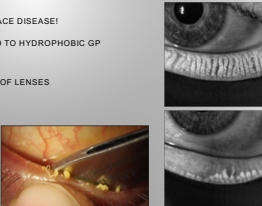
TREATMENT STRATEGIES

- INCREASED LUBRICATION WITH PRESERVATIVE-FREE ARTIFICIAL TEARS OVER THE LENS THROUGHOUT THE DAY
- REMOVE, MANUALLY CLEAN, RINSE AND REAPPLY
- SQUEEGEE TECHNIQUE
- ON-EYE SURFACE CLEANING USING A SALINE MOISTENED COTTON SWAB OR EYE SHADOW APPLICATOR
- POLISH FRONT SURFACE OF LENSES BUT REMOVE PLASMA SURFACE




FIRST AND FOREMOST

- TREAT AND MANAGE OCULAR SURFACE DISEASE!
- LIPIDS AND MUCINS ARE ATTRACTED TO HYDROPHOBIC GP MATERIAL
- RE-EVALUATE CARE AND HANDLING OF LENSES
- EVALUATE AND TREAT GPC
- CHANGE LENS MATERIAL
- PUNCTAL OCCLUSION



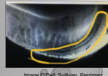
PREVENTION THROUGH EDUCATION



- WASH HANDS BEFORE HANDLING CONTACT LENSES
- ASK PATIENTS ABOUT HAND SOAP
 - MILD, BASIC HAND SOAPS
 - CONTACT LENS HANDSOAP
 - ACNE TREATMENT HAND SOAPS
- ASK PATIENTS ABOUT FACE AND EYE CREAMS



PREVENTION THROUGH EDUCATION

- DO NOT APPLY OIL-BASED MOISTURIZERS TO THE EYELIDS
- DO NOT APPLY ANY MAKEUP TO THE INSIDE AREA OF THE EYELID MARGIN (WATERLINE) OR MEIBOMIAN GLAND ORIFICES
- INCREASES RISK FOR MGD AND GLAND OBSTRUCTION OVER TIME
- APPLY CREAMS AND MAKEUP AFTER LENS INSERTION
- REMOVE CONTACT LENSES, THEN REMOVE MAKEUP



TOP 10 OCULAR SURFACE-OFFENDING INGREDIENTS	TOP 10 OCULAR SURFACE BEAUTY BLUNDERS
 <ol style="list-style-type: none"> 1. BENZALKONIUM CHLORIDE (BAK) 2. ALCOHOL 3. RETINOL 4. PARABENS 5. ISOPROPYL CLOPROSTENATE 6. FORMALDEHYDE & FORMALDEHYDE DONORS 7. PHENOL/ETHANOL 8. BUTYLENE GLYCOL 9. ETHYLENEDIAMINETETRAACETIC ACID (EDTA) 10. ARGIRELINE (ACETYL HEXAPEPTIDE 8, UNPATED) 	 <ol style="list-style-type: none"> 1. WATERPROOF EYE MAKEUP 2. EYELID TATTOOING 3. EYELASH EXTENSIONS 4. EYELASH TINTING 5. OTC EYELASH GROWTH SERUMS 6. BOTOX-IN-A-JAR 7. BOTOX FOR CROW'S FEET 8. RETIN-A 9. LOOSE EYESHADOW OR GLITTER 10. SHARING MAKEUP

PREVENTION THROUGH PATIENT EDUCATION

- USE EYELINER PENCILS – SHARPEN THEM BEFORE EVERY APPLICATION
- REPLACE MOIST COSMETICS (MASCARA) MONTHLY
- REMOVE MAKEUP DAILY
- NEVER USE FACIAL CLEANSERS OR HAND SOAP TO REMOVE EYE MAKEUP
- CLEAN EYE MAKEUP BRUSHES REGULARLY

SOLUTIONS

- CHANGE TO PEROXIDE BASED SOLUTIONS
- CONSIDER ENZYMATIC CLEANER / MENTHON PROGENT
- IF DEPOSIT-PRONE, ALTERNATE A DAILY GP LENS CLEANER WITH AN EXTRA STRENGTH OR AN ALCOHOL-BASED DAILY CLEANER



APPLICATION SOLUTIONS

Application Solutions			
0.9% sodium chloride inhalation solution No buffers, no preservatives Off label 3ml or 3ml vials Box of 100 vials	LacRipure (Menicon) No buffers, no preservatives FDA approved 5 ml vials Box of 18 vials	ScleralFi (Bausch+Lomb) Contains buffers, no preservatives FDA approved 10 ml vial Box of 30 vials	Purilens Plus (Purilens) Contains buffers FDA approved 4oz ounce bottle bottle replaced every 15 days



PLASMA TREATMENT

- Finished lens bombarded with high-energy radio waves in an oxygen-rich environment
- GP lens surface undergoes radiofrequency ionized oxygen that make hydrophobic surfaces more hydrophilic
- Exotic oxygen radicals strike the surface of the lens
 - Dislodges hydrocarbons such as oils
- Molecules on the surface of the lens are rearranged
 - carbon migrates away from the surface
 - oxygen and nitrogen migrate toward the surface
- The lens surface becomes ionized, increasing its ability to attract liquids


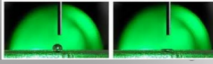


Diagram showing a lens surface being treated with plasma, with particles and energy waves indicated.

PLASMA TREATMENT

- RESULTS IN
 - IMPROVED WETTING ANGLE
 - IMPROVED SURFACE TENSION
 - FEWER LIPID, PROTEIN AND BACTERIA DEPOSITS
- IMPROVES SURFACE WETTABILITY
- LESS LENS AWARENESS
- IMPROVED COMFORT
- REDUCED FOGGING



Wetting angle before and after plasma treatment

Tangible Hydra-PEG Coating

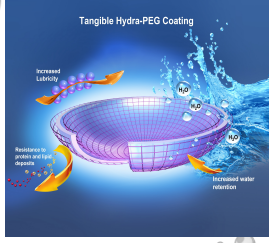
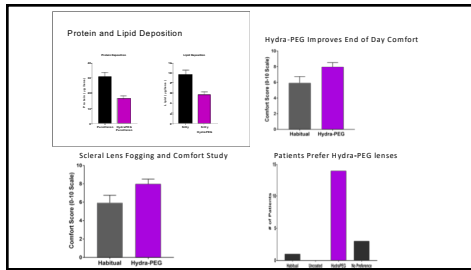
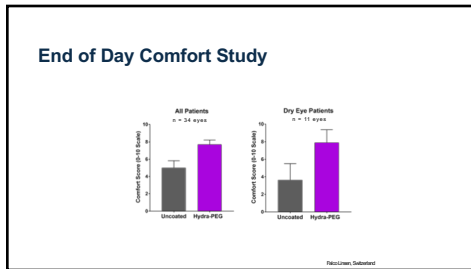


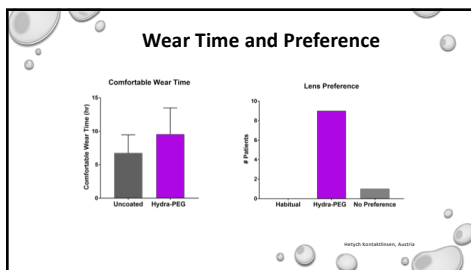
Diagram illustrating the Hydra-PEG coating on a lens surface, showing water molecules and the coating structure.

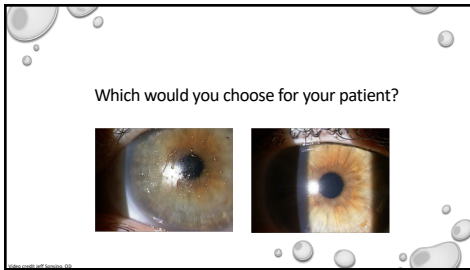
- Polymer encapsulates lens
- Improves wettability
- Increases surface water retention
- Increases lubricity
- Reduces deposits

Labels in diagram: Increased Lubricity, Resistance to protein and lipid deposits, Increased water retention.

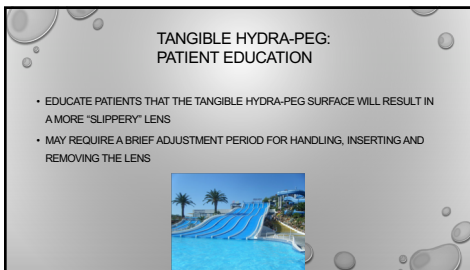












TANGIBLE HYDRA-PEG: PATIENT SELECTION

- MAY BE USED BY ANY PATIENT
- NO CONTRAINDICATIONS
- NO NEED FOR FIT CHANGES
- PATIENTS WHO MAY BENEFIT THE MOST:
 - THOSE EXPERIENCING DRYNESS OR DISCOMFORT ASSOCIATED WITH LENS WEAR
 - MODERATE TO HEAVY DEPOSITORS
 - SCLERAL LENS WEARERS EXPERIENCING FOGGING

COMPATIBLE SOLUTIONS WITH TANGIBLE HYDRA-PEG


- MULTIPURPOSE SOLUTIONS
 - MENICON UNIQUE PH
 - BOSTON SIMPLUS®
- HYDROGEN PEROXIDE SOLUTIONS
 - CLEAR CARE®
 - CLEAR CARE® PLUS WITH HYDRAGLYDE®



DANGER DO NOT USE


INCOMPATIBLE SOLUTIONS

- TAP WATER, ABRASIVE OR ALCOHOL-BASED CLEANERS
- ABRASIVE CLEANERS
 - BOSTON® ADVANCE
- ALCOHOL BASED CLEANERS
 - MIRAFLOW
- OTHERS
 - MENICON PROGENT
 - BOSTON ONE STEP LIQUID ENZYMATIC CLEANER
 - OPTIMUM BY LOBO® ESC EXTRA STRENGTH CLEANER



TANGIBLE HYDRA-PEG BY THE NUMBERS

- WITH PROPER CARE, COATING LASTS 12-18 MONTHS
- HYDRA-PEG WAS LAUNCHED IN JANUARY 2017
- 40,000 PATIENTS TREATED IN 2017
- HYDRA-PEG COATED LENSES AVAILABLE FROM 23 GLOBAL MANUFACTURERS
- PRICE IS MINIMAL COMPARED TO PRICE OF LENS



Tangible Authorized Labs

United States	Global
<ul style="list-style-type: none">• ABB• Acculens• Advanced Vision Technologies• Alden Optical• Art Optical• Blanchard• Boston Foundation for Sight• Essilor Lenses	<ul style="list-style-type: none">• GP Specialists• Metro Optics• Synergeyes• TruForm Optics• Valley Contact• Visionary Optics• Visionary Lens• Xcel Specialty Contacts• Northern Lenses• Corneal Lens Corporation• Falco Linson AG• Galba Contactlinsen• asych Kontaktlinsen• LKS• Multilens• Medifacis• No7 Contact Lenses• Northern Lenses

Before Hydra-PEG

