Contact Lens Dropout Prevention

Melissa Barnett, OD, FAAO, FSLS, FBCLA

TWIN CITIES
OCULAR SURFACE
DISEASE SYMPOSIUM

Disclosures

- Acculens
- Alcon
- Allergan
- Bausch + Lomb
- Contamac
- Coopervision
- Gas Permeable Lens Institute (GPLI)
- Johnson & Johnson Vision
- Novabay
- Ocusoft
- Paragon Bioteck
- Scleral Lens Education Society
- Shire
- Sjogren's Syndrome Foundation
- STAPLE program
- SynergEyes
- Visioneering Technologies

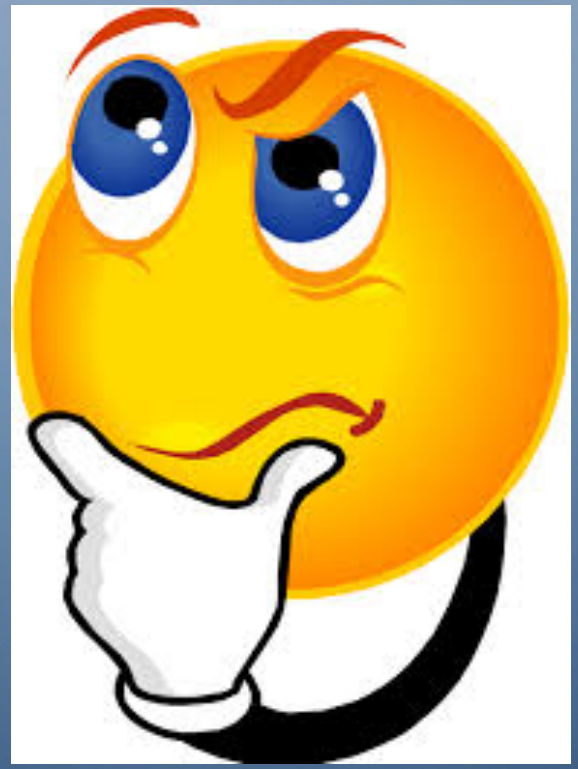
TWIN CITIES
OCULAR SURFACE
DISEASE SYMPOSIUM

When a patient with dry eye presents for CL evaluation, what do you do?

TWIN CITIES OCULAR SURFACE DISEASE SYMPOSIUM

- No previous lens wear?
- Previous wear?
  - Successful?
  - Multiple failures based on poor vision, poor comfort, limited wear time?
- Fit the patient, and hope he/she will “adapt,” or “get better”?
- Prepare the ocular surface for CL wear?

- Pause…



Why Treat Ocular Surface Disease

TWIN CITIES OCULAR SURFACE DISEASE SYMPOSIUM

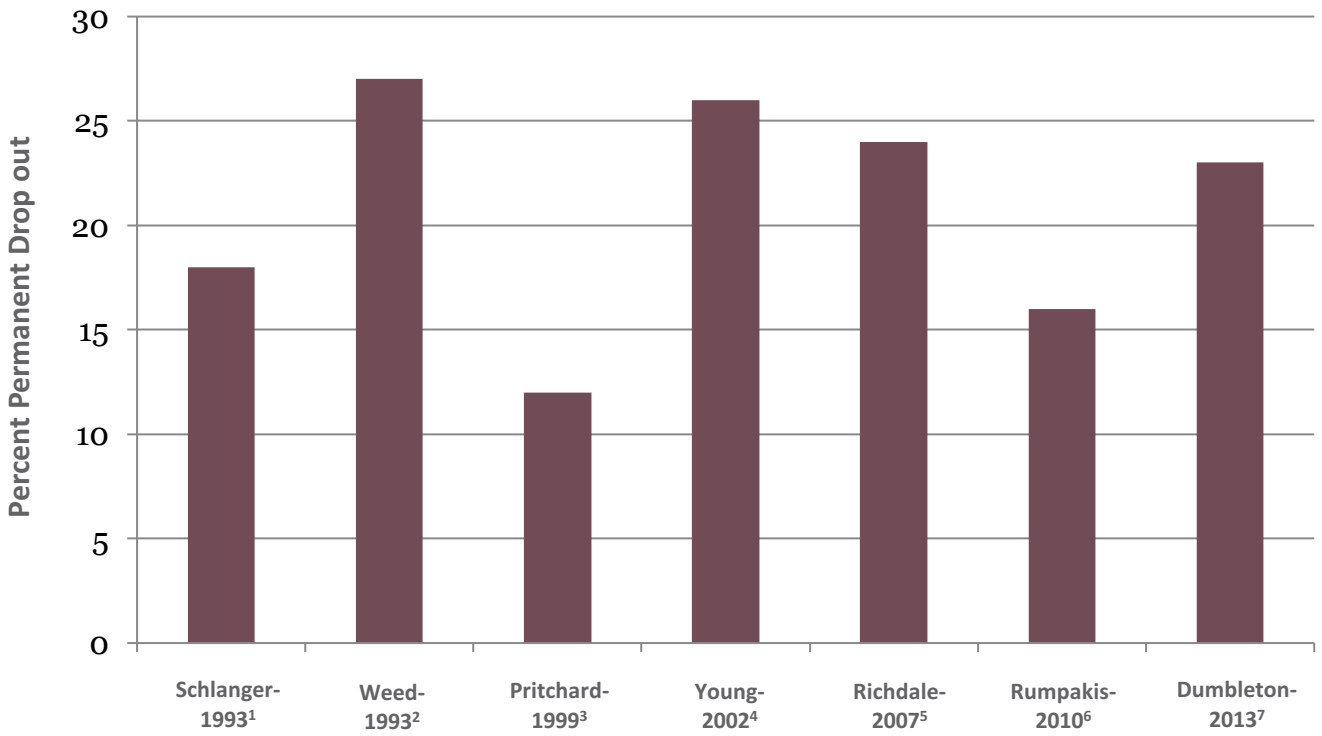
- Extend comfortable wearing time each day of contact lenses
- Improve comfortable wearing time of contact lenses at the end of the replacement period
- Improves vision with contact lenses – especially important for multifocal contact lens wearers
- Happy patients refer their friends to you

CL Dropout

TWIN CITIES OCULAR SURFACE DISEASE SYMPOSIUM

- Patient drop out rates have not changed much over time
- U.S dropout rate almost 16% - almost 1 in 6 contact lens patients

Contact Lens Dropout



Slide courtesy of Alcon

Contact lens markets 2016

257

3.0

15.8

2.3

1. Data on file. UK Incidence Study. Johnson & Johnson Vision 2016
2. Data on file. EMA Incidence data. Johnson & Johnson Vision 2017

Previous Drop-out Studies

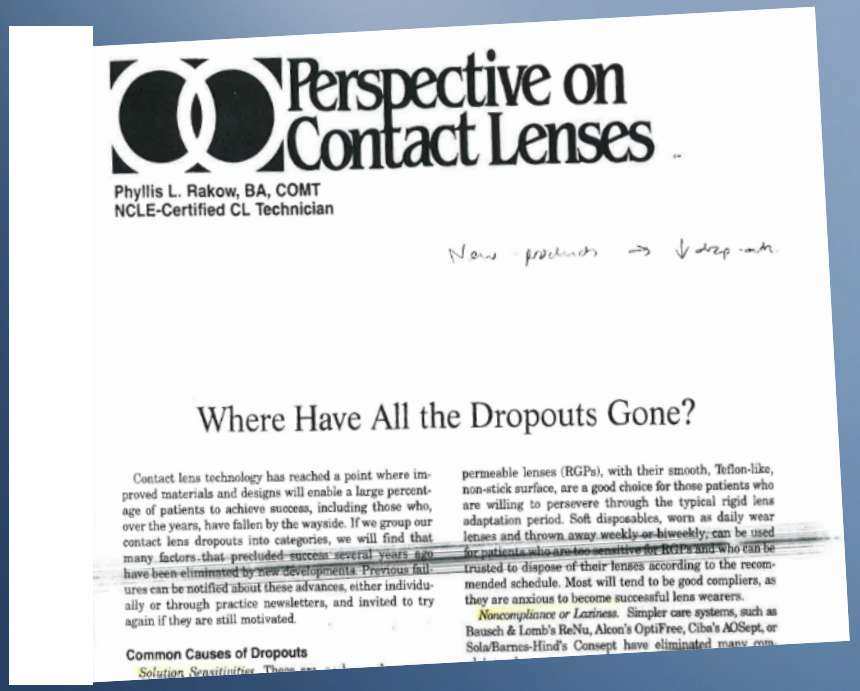
Reference	Year	N	Country	Methodology	Results
Dumbleton et al	2013	4207	Canada	Web-based survey	Discontinuations – 40% Permanent discontinuations – 23%
Rumpakis	2010	372	US (138), Taiwan, Korea + others	Web-based survey	'Dropout rates': US – 16%, Asia-PR – 31%, EMA – 30%
Richdale *et al*	2007	453	US (University)	Self-administered questionnaire	Discontinuations – 24% Dissatisfied CL wearers – 26%
Jutai et al	2003	418	Canada	Self-administered questionnaire	Discontinuations – 43%
Harknett et al	2001	115	UK (University clinic)	5-year chart review	Discontinuations – 29%
Pritchard et al	1999	1444	Canada (Quebec)	Mailshot questionnaire	Discontinuations – 34% Permanent discontinuations – 12%
Weed et al	1993	568	Canada (University)	Self-administered questionnaire	Discontinuations – 51% Permanent discontinuations – 40%

Definition of Dropout

TWIN CITIES OCULAR SURFACE DISEASE SYMPOSIUM

- % Ever discontinued CLs / Ever worn CLs
- % No longer wearing CLs / Ever worn CLs
- % Discontinued in last 2 years having worn CLs for longer than 6 months / Worn CLs in last 2 years
- **% New CL wearers discontinued in 1st year / Patients fitted with CLs**

Reasons for Dropout – Historical



Perspective on Contact Lenses

Phyllis L. Rakow, BA, COMT
NCLE-Certified CL Technician

New products ⇒ ↓ drop-outs

Where Have All the Dropouts Gone?

Contact lens technology has reached a point where improved materials and designs will enable a large percentage of patients to achieve success, including those who, over the years, have fallen by the wayside. If we group our contact lens dropouts into categories, we will find that many factors that precluded success several years ago have been eliminated by new developments. Previous failures can be notified about these advances, either individually or through practice newsletters, and invited to try again if they are still motivated.

Common Causes of Dropouts

Solution Sensitivities. There are

permeable lenses (RGPs), with their smooth, Teflon-like, non-stick surface, are a good choice for those patients who are willing to persevere through the typical rigid lens adaptation period. Soft disposables, worn as daily wear lenses and thrown away weekly or biweekly, can be used for patients who are too sensitive for RGPs and who can be trusted to dispose of their lenses according to the recommended schedule. Most will tend to be good compliers, as they are anxious to become successful lens wearers.

Noncompliance or Laziness. Simpler care systems, such as Bausch & Lomb's ReNu, Alcon's OptiFree, Ciba's AOSept, or Sola/Barnes-Hind's Consept have eliminated many com-

Rakow PL. *J Oph Nurs Tech* 1990; 9:223-4

Common Causes:

Presbyopia

Dry eye

GPC, heavy deposits

Residual astigmatism

Poor comfort w RGPs

Hypoxia

Lens durability

Lapsed CL Wearer Study
Underlying Causes of CL Discontinuations

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Contact Lens & Anterior Eye

Contact Lens & Anterior Eye 27 (2004) 83–85

www.elsevier.com/locate/clae

Clinical note

Why one million contact lens wearers dropped out☆

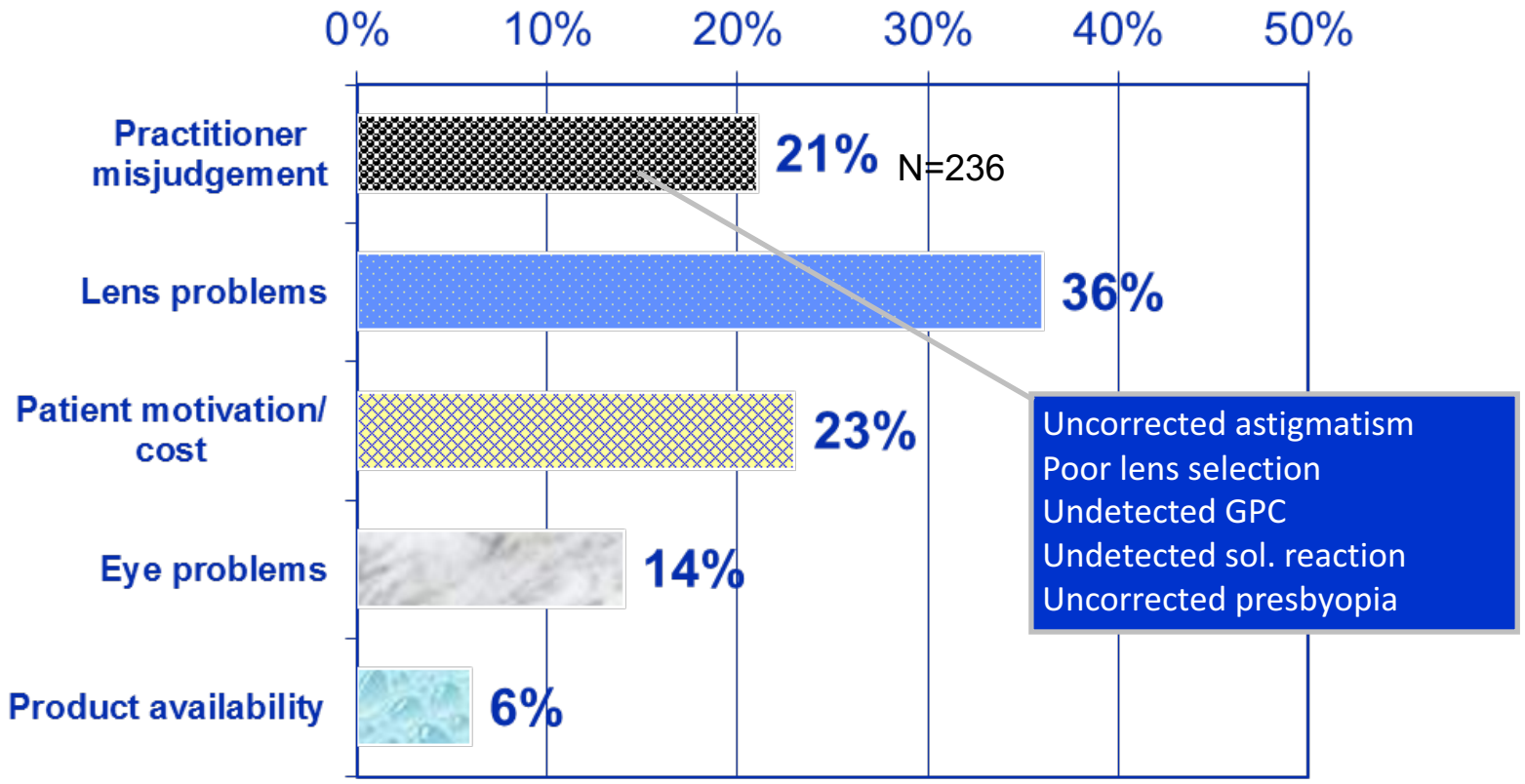
Graeme Young

Visioncare Research, Farnham, Surrey GU9 7LW, UK

The early 1990s saw a large increase in the number of contact lens wearers in the UK. It is estimated that this figure doubled between 1990 and 1996 to reach approximately three million wearers. The increased uptake of contact lenses during this period is thought to have been due to a number of factors, including the availability of frequent replacement soft lenses, the introduction of daily disposable lenses and the effects of television advertisments [1].

UK, 236 lapsed wearers were recruited with the intention of being refitted with contact lenses. The findings published at the end of the last year showed that a high proportion of lapsed contact lens wearers can be successfully refitted and usually with relative ease. On initial assessment, only a handful (2%) were considered to be fundamentally unsuitable for contact lens wear. More than 95% were dispensed lenses and of these 77% were considered successful after 1 month's

Cont Lens Ant Eye 2004; 27:83-5



Success rates with lapsed CL wearers

Ophthal. Physiol. Opt. 2002 22: 516–527

A multi-centre study of lapsed contact lens wearers

Graeme Young[1], Jane Veys[2], Nicola Pritchard[1] and Sarah Coleman[1]

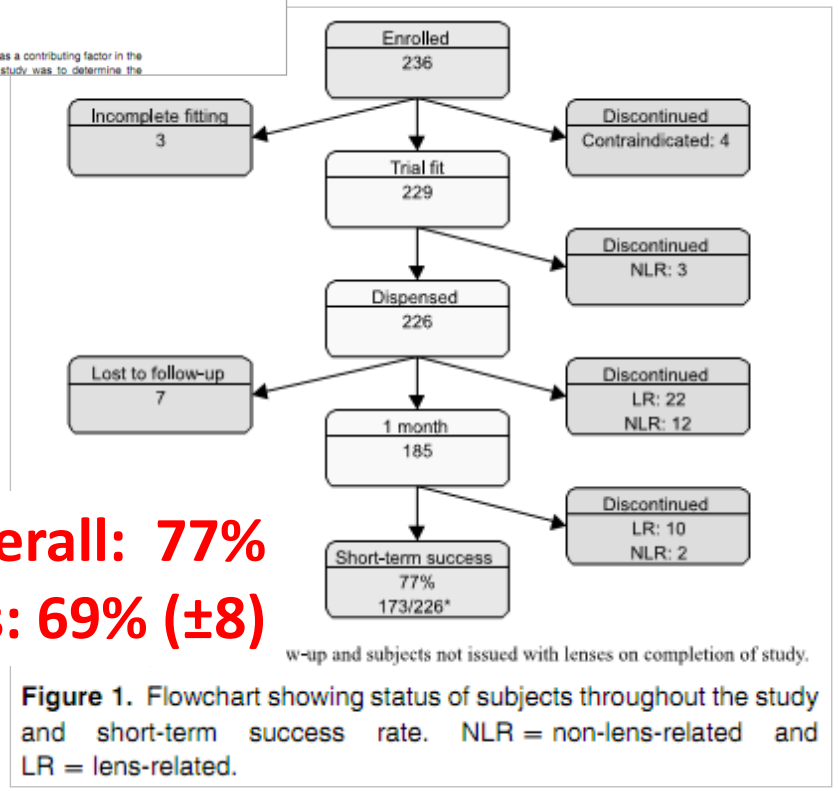
[1]Visioncare Research Ltd, Farnham, Surrey, and [2]Johnson & Johnson Vision Care, Bracknell, Berkshire, UK

Abstract

Purpose: Discontinuation from contact lens wear has been identified as a contributing factor in the lack of growth of contact lens use in Europe. The purpose of this study was to determine the

Toric soft lens success rate at 1-month

2001



w-up and subjects not issued with lenses on completion of study.

Figure 1. Flowchart showing status of subjects throughout the study and short-term success rate. NLR = non-lens-related and LR = lens-related.

Overall: 77%

Torics: 69% (±8)

2012

OPO OPHTHALMIC & PHYSIOLOGICAL OPTICS
THE JOURNAL OF THE COLLEGE OF OPTOMETRISTS

Ophthalmic & Physiological Optics ISSN 0275-5408

Clinical evaluation of fitting toric soft contact lenses to current non-users

Anna Sulley[1], Graeme Young[2], Kathrine Osborn Lorenz[3] and Chris Hunt[2]

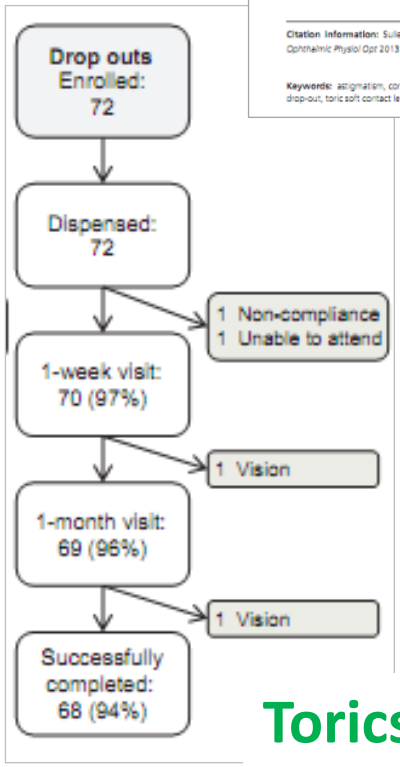
[1]Johnson & Johnson Vision Care, Wokingham, UK, [2]Visioncare Research Ltd., Farnham, UK, and [3]Johnson & Johnson Vision Care, Inc., Jacksonville, USA

Citation information: Sulley A, Young G, Lorenz KO & Hunt C. Clinical evaluation of fitting toric soft contact lenses to current non-users. *Ophthalmic Physiol Opt* 2013, **33**, 94–103. doi: 10.1111/opo.12028

Keywords: astigmatism, contact lens fitting, drop-out, toric soft contact lenses

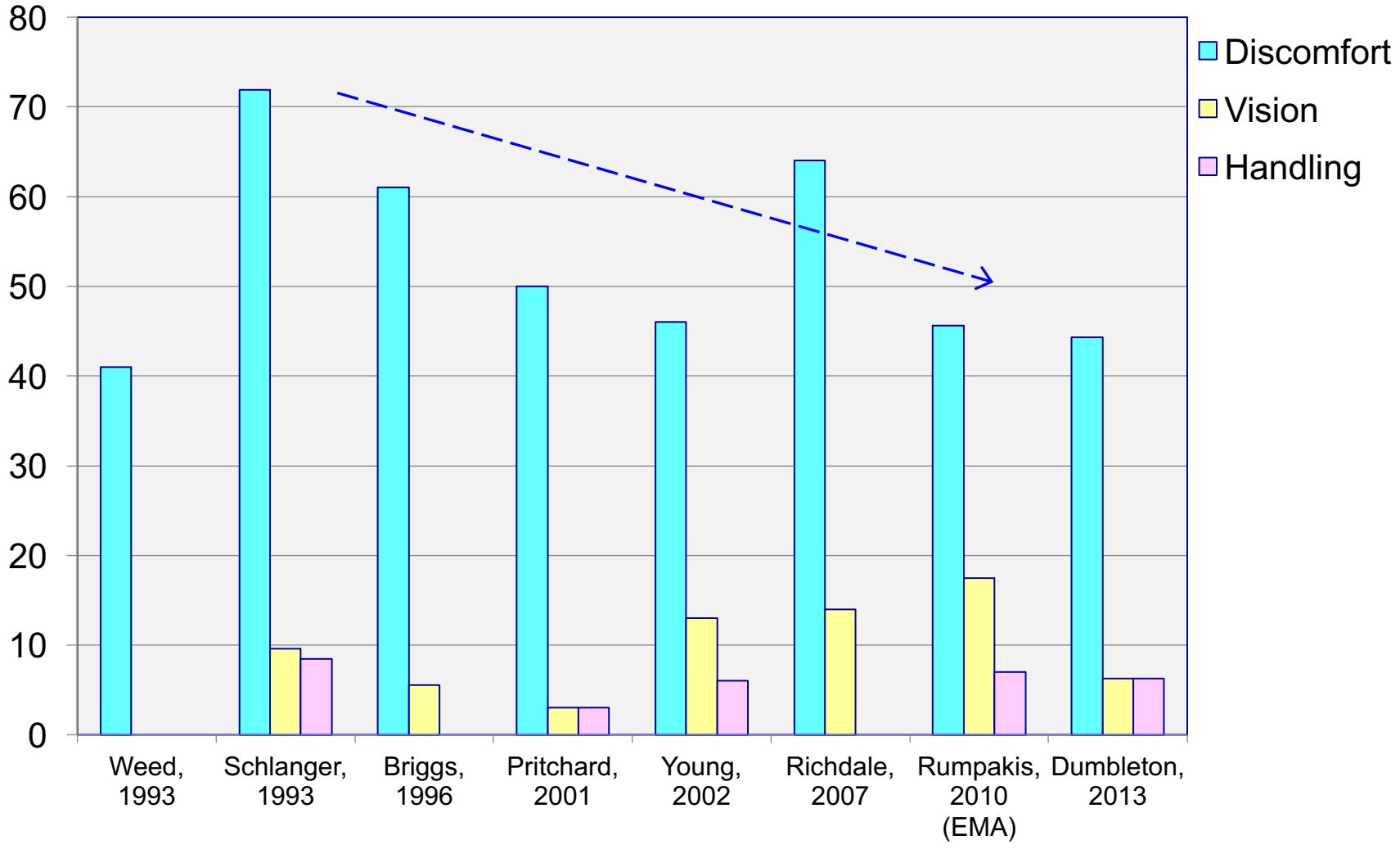
Abstract

Purpose: To evaluate the ease with which astigmats from three groups of current



Torics: 94% (±10)

Habitual Reasons for Discontinuation



New Contact Lens Wearer Retention

- How big is the problem?
- What are the causes of lapsing?
- What can we do?

ARTICLE

Retention Rates in New Contact Lens Wearers

Anna Sulley

Contact Lens and Anterior Eye xxx (2016) xxx–xxx

Contents lists available at ScienceDirect

Contact Lens and Anterior Eye

journal homepage: www.elsevier.com/locate/clae

Factors in the success of new contact lens wearers

Anna Sulley, BSc, MCOptom, FAAO[a,*], Graeme Young, MPhil, PhD, FCOptom, DCLP, FAAO[b], Chris Hunt, MSc[b]

[a] Johnson Vision Care Companies, Johnson & Johnson Medical Ltd., Pinewood Campus, Nine Mile Ride, Wokingham, RG40 3EW, UK
[b] Visioncare Research Ltd, UK

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Methods: This multi-site study was a retrospective chart review of the status of neophyte CL wearers fitted in representative UK eye care practices.
Results: Consecutive records for 524 patients at 29 sites were reviewed. Mean age at dispensing was 34 years (range 8–79), 68% were under 45 years and 61% female. Soft CLs were fitted to 98% of patients. After 12 months, 388 were still CL wearers, a retention rate of 74% (95% CI: 70.1–77.6). Of the 136 lapsed, 25% discontinued during the first month and 47% within 60 days. The main reasons cited for discontinuation included poor distance vision (26%; of whom, 37% were toric and 51% multifocal), poor near vision (16%), discomfort (14%) and handling problems (15%). In 32% of cases, the reasons for discontinuation were unknown. For 71% of dropouts, no alternative lens or management strategy had been tried. Significant factors associated with retention in univariate analysis were: age (younger), sphere power (higher), lens type (sphere vs multifocal) and purchase frequency (regular). Multivariate analysis showed lens sphere power, purchase frequency and lens material to be significant factors. There was a wide variation in retention rates between sites (40–100%).
Conclusions: During the first year of CL wear, the overall retention rate for neophyte CL wearers was 74% (spherical CLs 79%, torics 73%, multifocals 57%), with many lapsing during the first 2 months. Factors associated with retention and dropout in these patients include: lens power, material and type, and purchase frequency. While handling and comfort are the most commonly cited performance-related reasons for discontinuing in new spherical lens wearers, visual problems are the most common among new wearers of toric and, in particular, multifocal CLs.

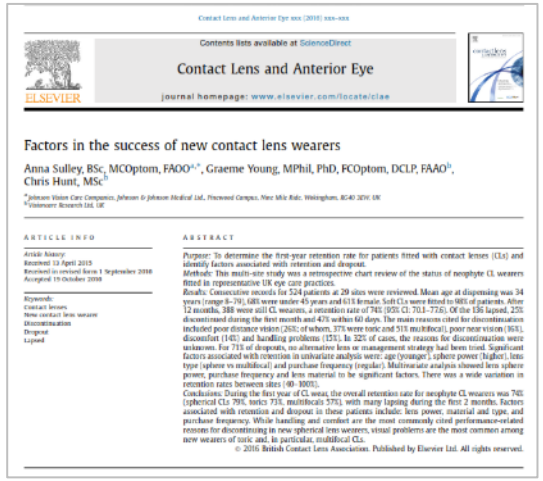
Sulley A, Young G & Hunt C. Factors in the success of new contact lens wearers. CLAE 2016 40(1):15-24
Sulley A, Young G, Hunt C et al. Retention rates in new contact lens wearers. ECL 2017 In press

New CL wearer retention studies

Objectives

Determine **1st year retention rate: overall** and by **CL type & modality**

Identify **factors affecting CL retention** rates



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Cont Lens Ant Eye 2016

Retrospective

Multi-centre

Sponsor-masked

ECP chart review

'ECP view'

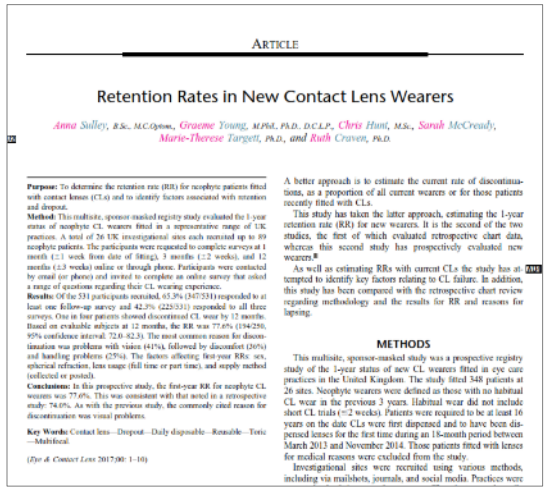
Prospective

Multi-centre

Sponsor-masked

Wearer survey

'Patient view'



ARTICLE

Retention Rates in New Contact Lens Wearers

Anna Sulley, B.Sc., M.C.Optom., Graeme Young, M.Phil., Ph.D., D.C.L.P., Chris Hunt, M.Sc., Sarah McCready, Marie-Therese Targett, Ph.D., and Ruth Craven, Ph.D.

Purpose: To determine the retention rate (RR) for neophyte patients fitted with contact lenses (CLs) and to identify factors associated with retention and dropout.
Method: This multisite, sponsor-masked registry study evaluated the 1-year status of neophyte CL wearers fitted in a representative range of UK practices. A total of 26 UK investigational sites each recruited up to 30 neophyte patients. The participants were requested to complete surveys at 1 month (±1 week from date of fitting), 3 months (±2 weeks), and 12 months (±3 weeks) online or through phone. Participants were contacted by email (or phone) and invited to complete an online survey that asked a range of questions regarding their CL wearing experience.
Results: Of the 531 participants recruited, 65.3% (347/531) responded to at least one follow-up survey and 42.3% (225/531) responded to all three surveys. One in four patients showed discontinued CL wear by 12 months. Based on evaluable subjects at 12 months, the RR was 77.6% (194/250, 95% confidence interval: 72.0–82.3). The most common reason for discontinuation was problems with vision (41%), followed by discomfort (26%) and handling problems (25%). The factors affecting first-year RRs: sex, spherical refraction, lens usage (full time or part time), and supply method (collected or posted).
Conclusions: In this prospective study, the first-year RR for neophyte CL wearers was 77.6%. This was consistent with that noted in a retrospective study: 74.0%. As with the previous study, the commonly cited reason for discontinuation was visual problems.

Key Words: Contact lens—Dropout—Daily disposable—Reusable—Toric—Multifocal.

(*Eye & Contact Lens* 2017;00: 1–10)

A better approach is to estimate the current rate of discontinuations, as a proportion of all current wearers or for those patients recently fitted with CLs.

This study has taken the latter approach, estimating the 1-year retention rate (RR) for new wearers. It is the second of the two studies, the first of which evaluated retrospective chart data, whereas this second study has prospectively evaluated new wearers.[8]

As well as estimating RRs with current CLs the study has attempted to identify key factors relating to CL failure. In addition, this study has been compared with the retrospective chart review regarding methodology and the results for RR and reasons for lapsing.

METHODS

This multisite, sponsor-masked study was a prospective registry study of the 1-year status of new CL wearers fitted in eye care practices in the United Kingdom. The study fitted 348 patients at 26 sites. Neophyte wearers were defined as those with no habitual CL wear in the previous 3 years. Habitual wear did not include short CL trials (<2 weeks). Patients were required to be at least 16 years on the date CLs were first dispensed and to have been dispensed lenses for the first time during an 18-month period between March 2013 and November 2014. Those patients fitted with lenses for medical reasons were excluded from the study.

Investigational sites were recruited using various methods, including via mailshots, journals, and social media. Practices were

Eye Cont Lens – In Press

Study Methods

Retrospective 'Practitioner view'	Prospective 'Patient view'
29 UK practices, **524** patient records	**26** UK sites **58%** independent/regional, **42%** chains
Reviewed **10-25** sequential neophyte records. Current status neophytes fitted 09/11 – 03/13	Neophytes fitted 03/13 – 11/14
Site questionnaire: **type of practice** & ECP details	**532** surveys at 1, 3, & 12 months
Neophyte CL pxs No habitual CL wear in the previous 3 years Aged ≥8 years	Neophyte CL pxs No habitual CL wear in previous 3 years Aged ≥18 years
Px questionnaire: CL type & **Discontinuation** (Y/N, Reason)	Questions via online or telephone survey **348** responded to ≥ 1 survey **225** responded to all 3 surveys **71.8%** (250/348) responded to 12 month survey


UK Contact Lens New Wearer Survey

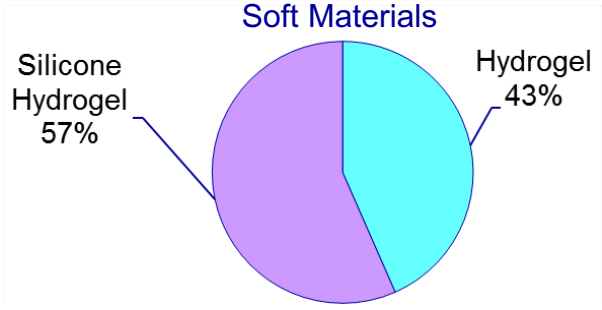
1-month Questionnaire

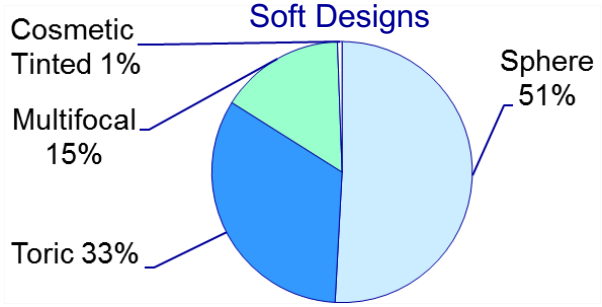
Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. CLAE 2016;40:1 15-24

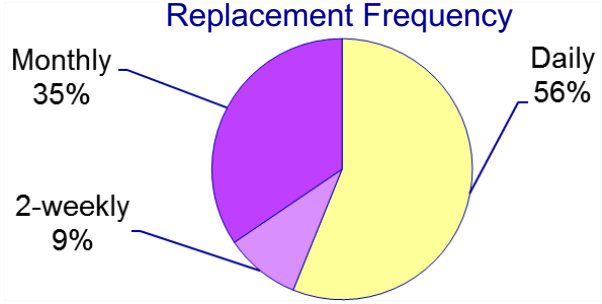
Sulley A, Young G, Hunt C et al., Retention rates in new contact lens wearers. ECL 2017 (in press)

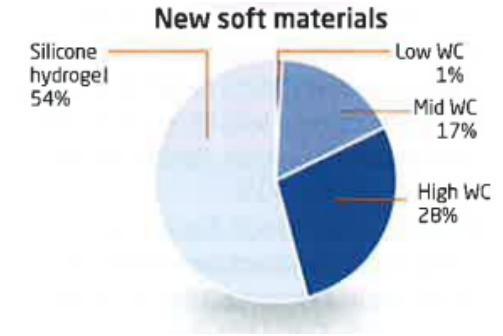
CL Retention Study – 2014

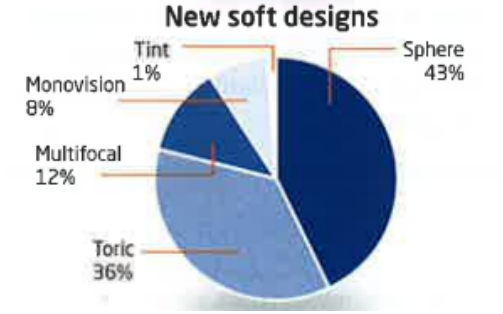
Results – Lens Types

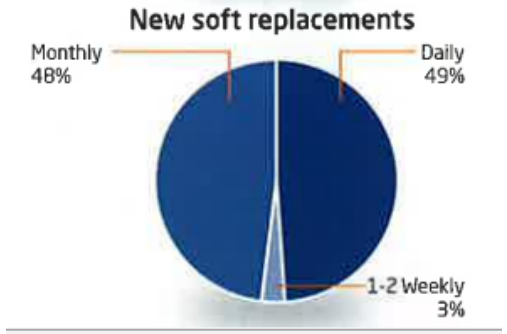













Contact Lens Mo

Trends in UK contact lens prescribing

For the 18th consecutive year, Professor Philip Morgan reports on the Euroiens Research survey into the prescribing habits of British contact lens practitioners

According to the Association of Contact Lens Manufacturers, there are about 17 million contact lens wearers in the UK, a number which has remained fairly stable over recent years. Of interest to optometrists, opticians and the industry generally are the types of lenses prescribed in order that we can track the success or otherwise of innovations in lens designs, material types and replacement modalities. Since 1996, we have tracked generic (non-branded) information about the lenses and solutions prescribed in the UK[1-17] and this paper outlines our findings for 2013.

In order to generate our data, at the start of each calendar year, we write to 1,000 registered practitioners (700 optometrists and 300 contact lens opticians randomly selected from the GOC register) with an A4 questionnaire. We request data about the following: date of fitting, sex (a or refit), age and sex of patient, lens material, lens design, frequency of replacement, days per week of wear, modality (daily or extended wear) and care options.

This year we received information about 781 contact lens fits from 56 contact lens opticians, 23 optometrists and one undefined practitioner. The mean patient age at fitting was 34.7 years, a value which may be higher than generally appreciated. This value is much higher for patients fitted with rigid lenses (48.7 years) compared with those receiving soft lenses (33.6 years). As before females accounted for about two thirds (63 per cent) of lens fits. Twenty three per cent of lenses were prescribed as a part-time (three days per week or fewer).

Rigid vs soft lens fits

Rigid lenses remain rarely prescribed as a new fit (3 per cent) although higher numbers are fitted to existing wearers at 14 per cent (Figure 1).

Soft toric lenses remain widely prescribed (36 per cent of new fits) and soft multifocals have maintained their recent increase in use (12 per cent of new soft fits in 2013, double the prescribing rate of five years ago). Solutions prescribing is dominated by multipurpose products (93 per cent).

Soft lens details

Silicone hydrogels remain the material of choice for cont soft lenses prescribed, each lenses account for 54 per cent of new soft lens fits. The large increase in the use of these materials since 2002 is shown in Figure 2. Clearly, the rise of silicone hydrogels has been approximately matched by the decline of conventional hydrogel materials used on a non-daily disposable basis. This same figure also confirms the ongoing low prescribing rate of soft lenses for extended wear (4 per cent of all lens fits). Also of note is the increase in daily disposable prescribing over recent years, moving from 33 per cent to 44 per cent in the past five years. Some of this increase

Rigid lens details

The relatively small number of rigid lens fits means that while a detailed breakdown of lens types is of interest, the statistical confidence intervals around each sub-category data point are large, so some caution should be applied when considering individual figures. It is evident that low Dk materials are rarely prescribed and there is evidence for some orthokeratology prescribing.

Acknowledgements

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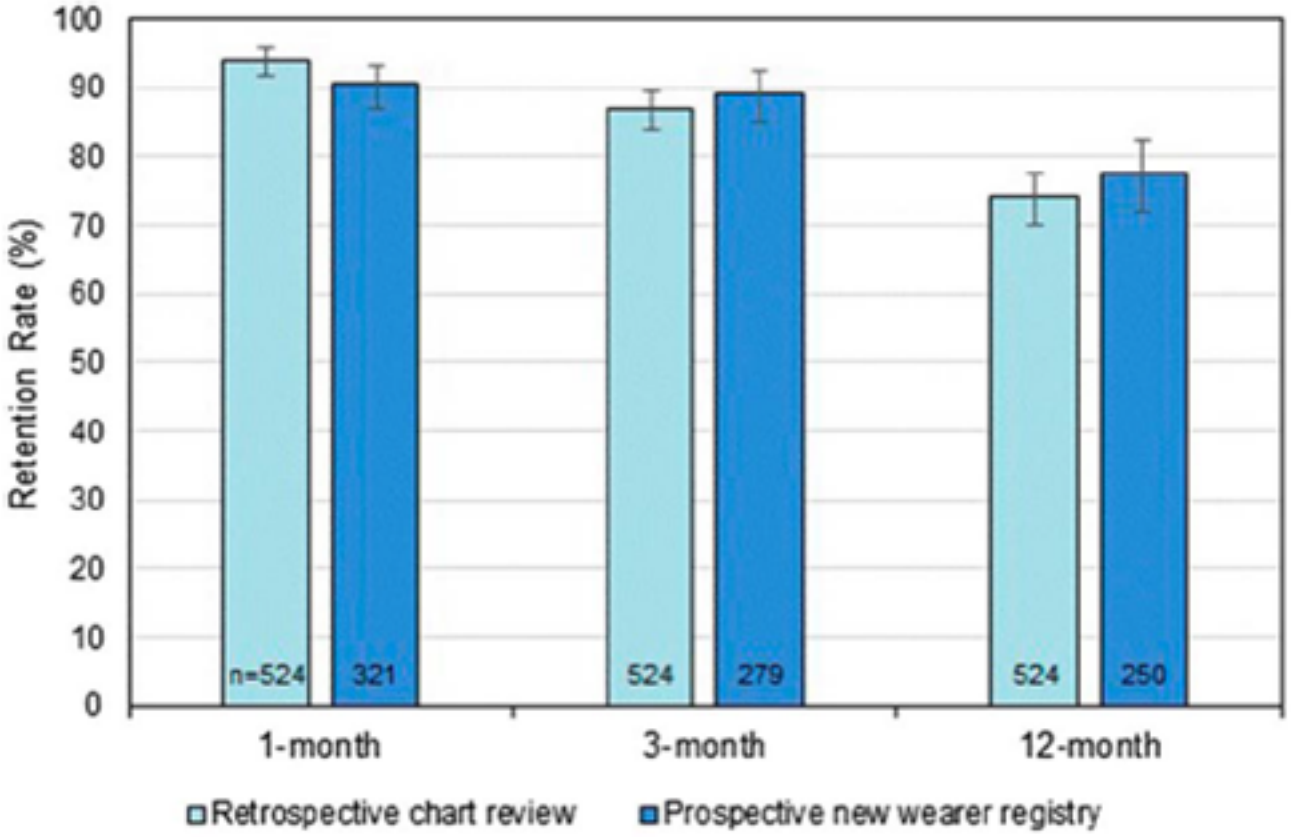
Overall fits 1997-2013

opticianonline.net

Overall new wearer retention rates



Retention rate at 12 months

Retrospective ***74%***

(95% CI: 70-77)

Prospective ***78%***

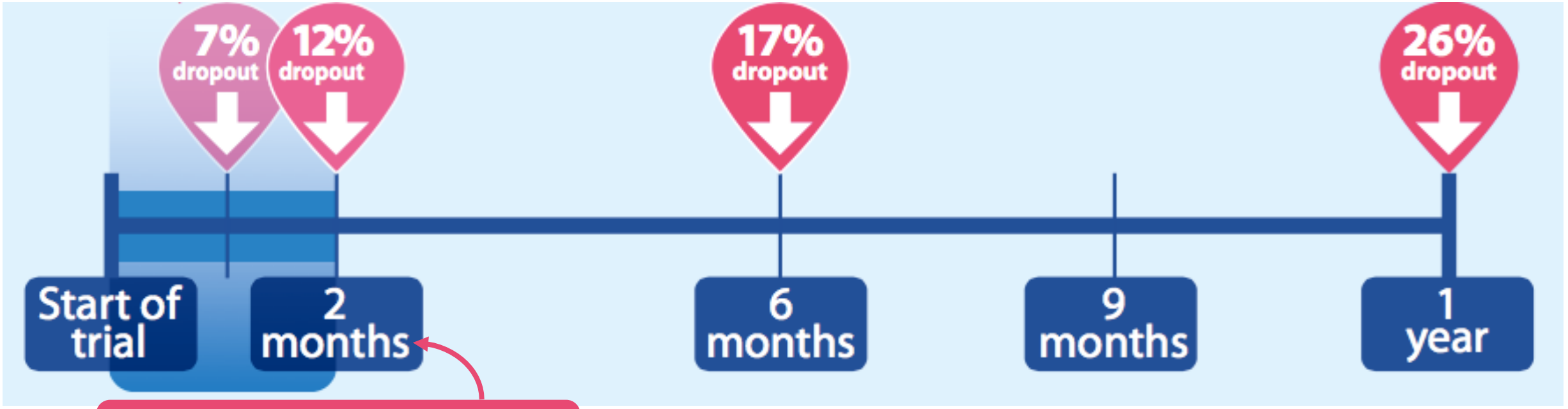
(95%CI: 72-82)

1 in 4 wearers drop out in the first 12 months

1. Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. Cont Lens Anterior Eye 2016;40:1 15-24
2. Sulley A, Young G, Hunt C et al., Retention rates in new contact lens wearers. Eye & CL June 2017 (in press)

Results: the practitioners' view

Proportion of Px who discontinued CLs by number of days since dispensing

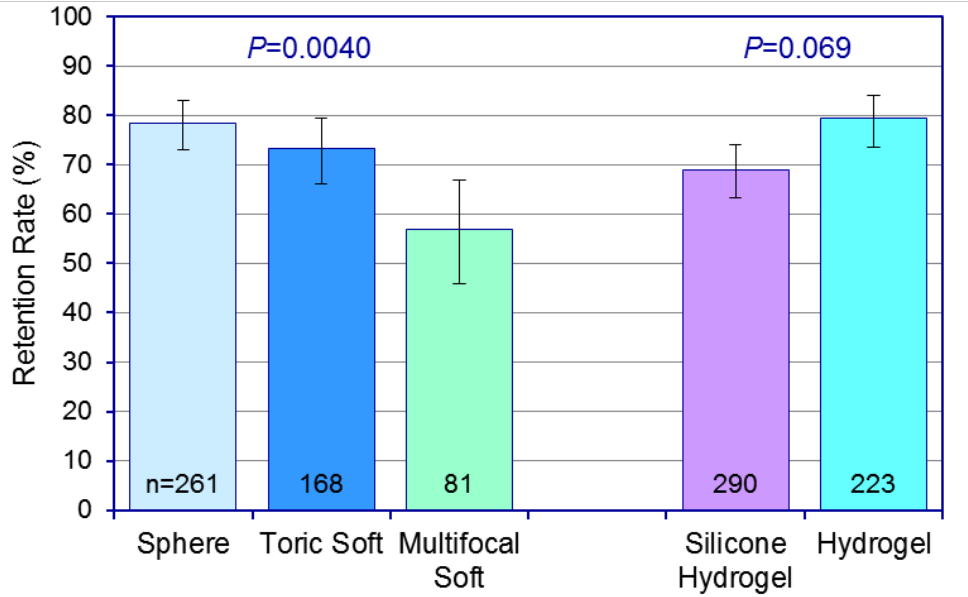


n=510, for 14 Px time discontinued unknown

Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. CLAE 2016;40:1 15-24.

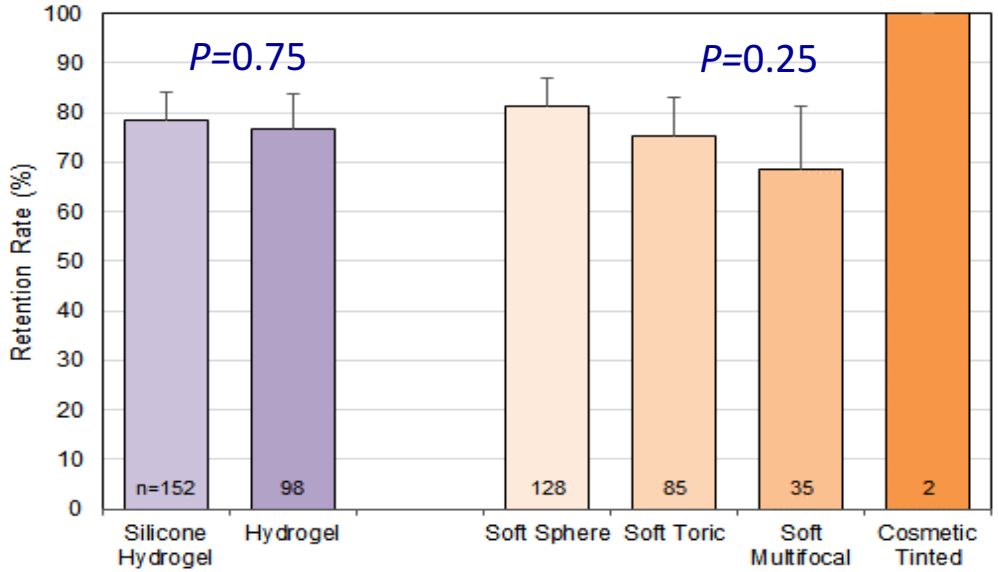
Results - Retention Rates by Lens Type

Retrospective Study



Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. CLAE 2016;40:1 15-24

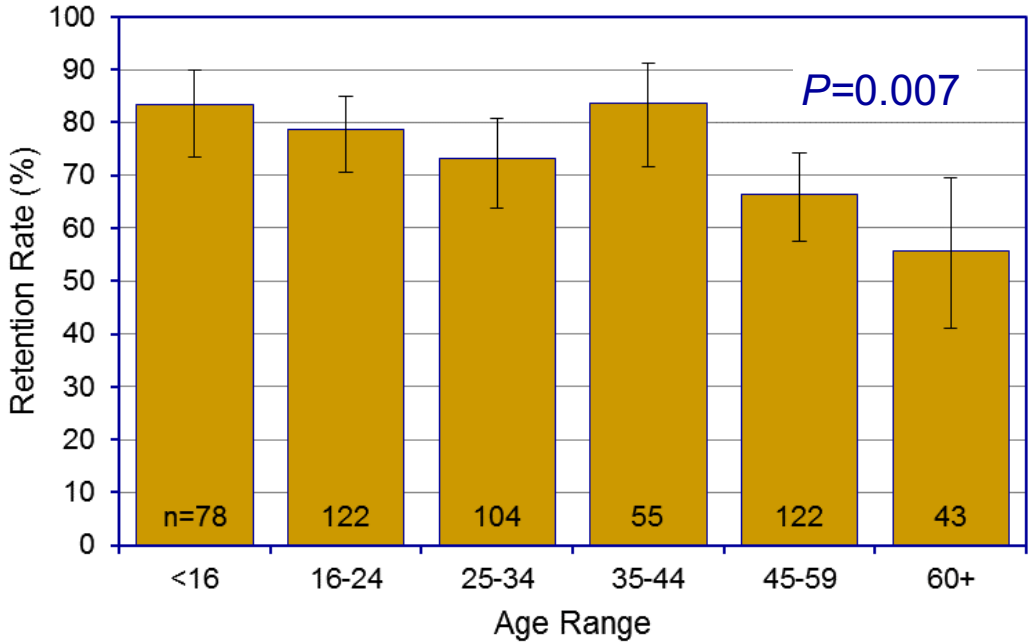
Prospective Study



Sulley A, Young G, Hunt C et al., Retention rates in new contact lens wearers. ECL 2017 (in press)

Results - Retention Rates by Age & Gender

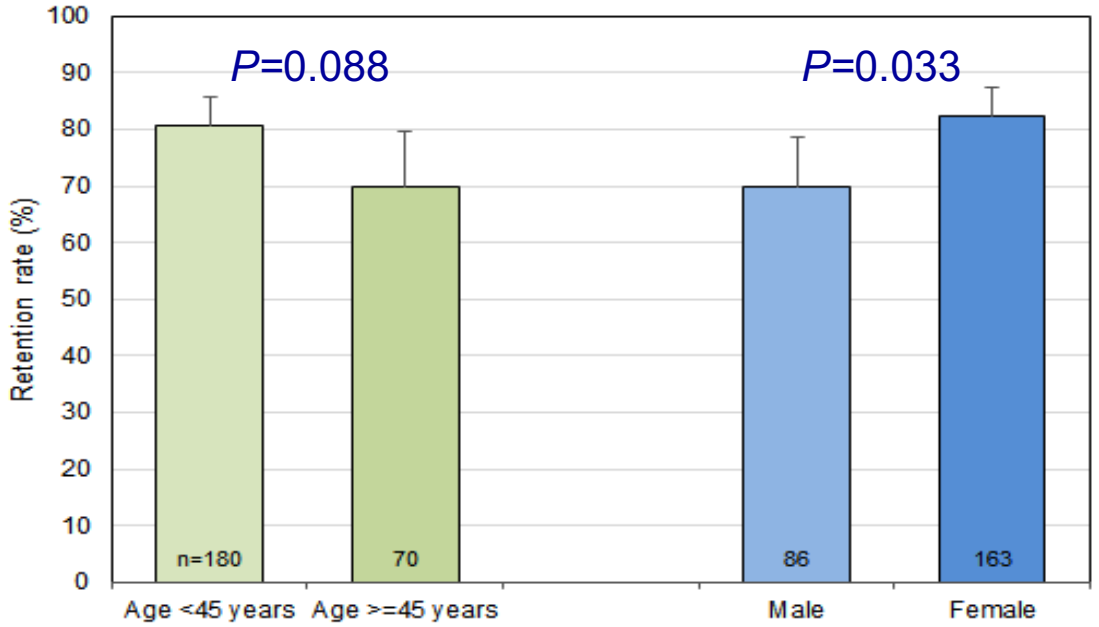
Retrospective Study



Male: 72%, Female: 78%, *P*=0.11

Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. CLAE 2016;40:1 15-24

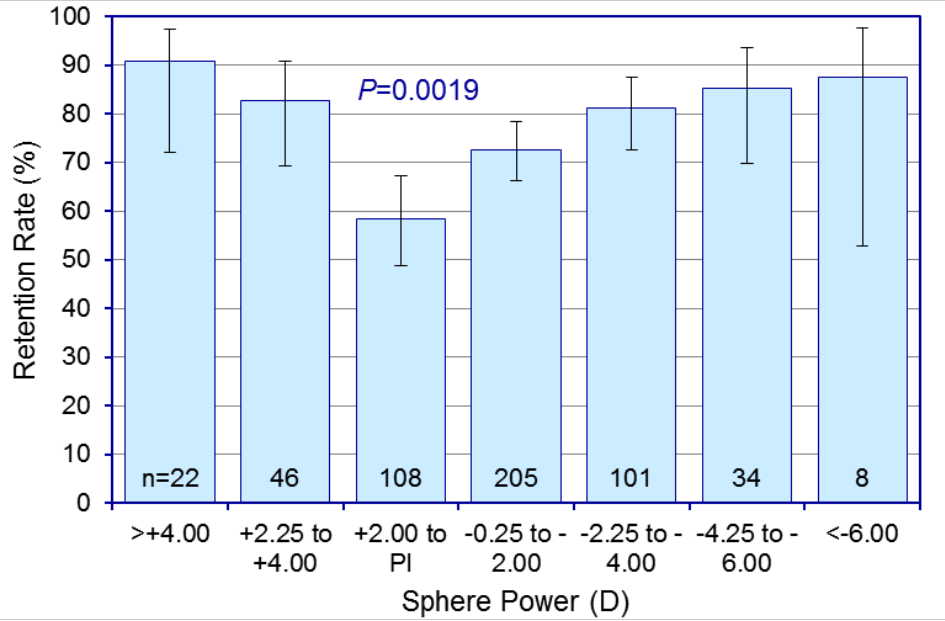
Prospective Study



Sulley A, Young G, Hunt C et al., Retention rates in new contact lens wearers. ECL 2017 (in press)

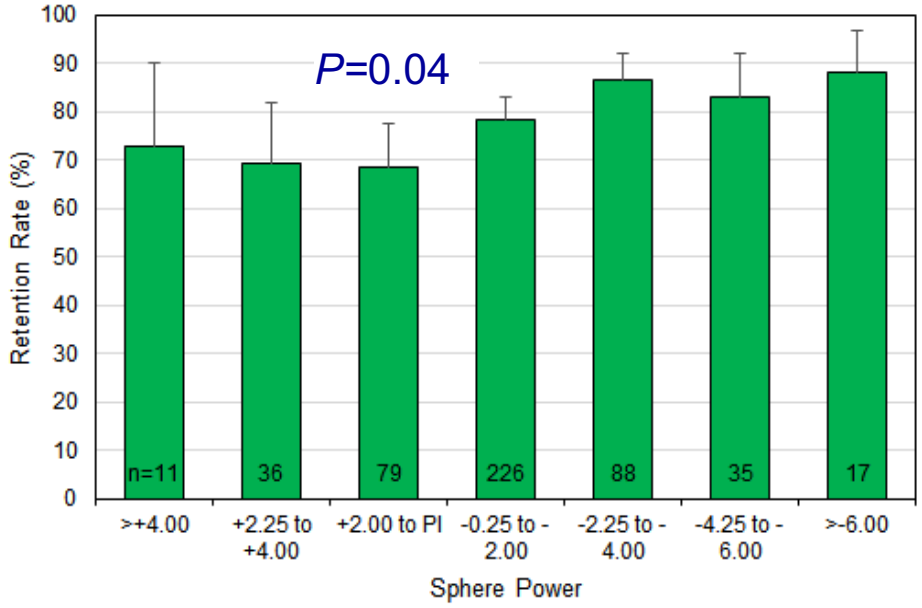
Results - Retention Rates by Sphere Power

Retrospective Study



Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. CLAE 2016;40:1 15-24

Prospective Study

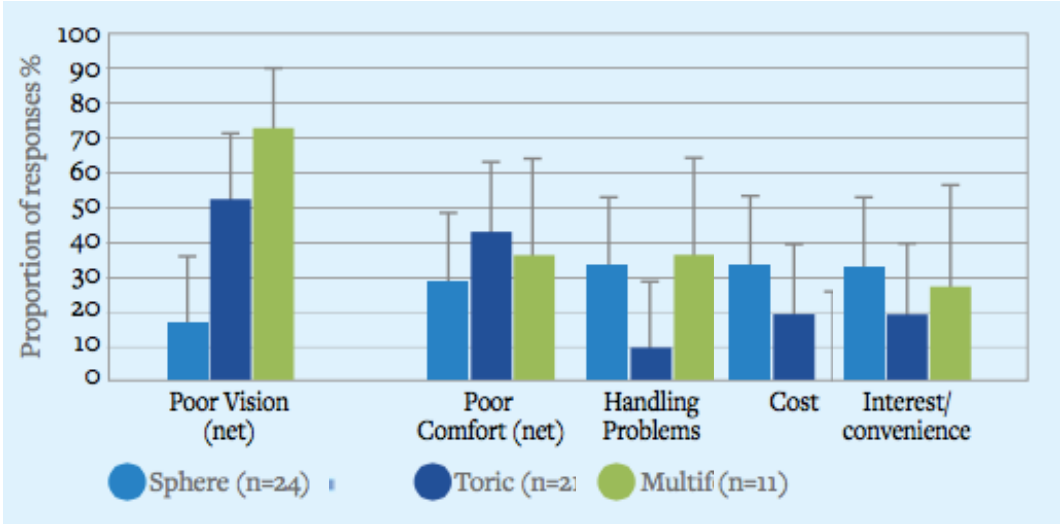


Sulley A, Young G, Hunt C et al., Retention rates in new contact lens wearers. ECL 2017 (in press)

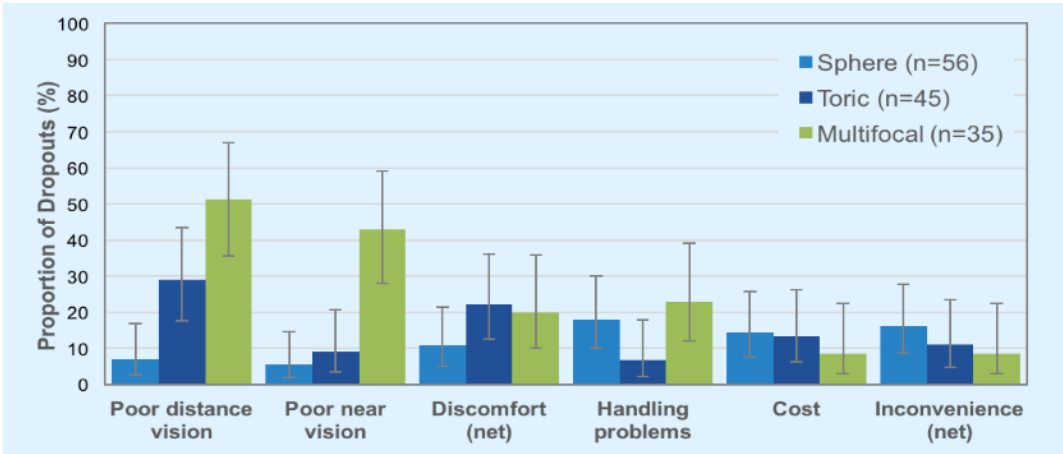
Results: reasons for discontinuing wear

Comparisons of reasons given in retrospective & prospective studies

Retrospective/ECP view



Prospective/Px view



Vision with **toric** and especially **multifocals** **more of a factor for new wearers** than previously thought

Comfort is still an important factor for **all** lens types

Handling for new wearers, especially **spherical** and **multifocal** is key

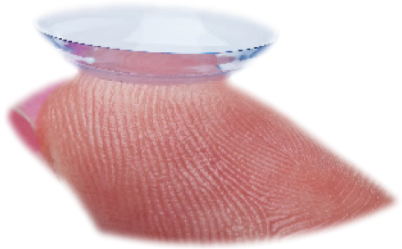
Cost can become an issue if lens performance poor

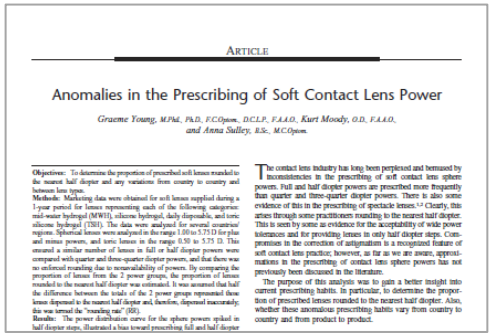
Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. CLAE 2016;40:1 15-24

Sulley A, Young G, Hunt C et al., Retention rates in new contact lens wearers. ECL 2017 (in press)

Full vision correction: often compromised

How does prescribing for spectacles compare to prescribing for CLs?





ARTICLE

Anomalies in the Prescribing of Soft Contact Lens Power

Graeme Young, M.Phil., Ph.D., F.C.Optom., D.C.L.P., F.A.A.O., Kurt Moody, O.D., F.A.A.O., and Anna Sulley, B.Sc., M.C.Optom.

Objectives: To determine the proportion of prescribed soft lenses rounded to the nearest half dioptre and any variations from country to country and between lens types.
Methods: Marketing data were obtained for soft lenses supplied during a 1-year period for lenses representing each of the following categories: mid-water hydrogel (MWH), silicone hydrogel, daily disposable, and toric silicone hydrogel (TSH). The data were analyzed for several countries/regions. Spherical lenses were analyzed in the range 1.00 to 5.75 D for plus and minus powers, and toric lenses in the range 0.50 to 5.75 D. This ensured a similar number of lenses in full or half dioptre powers were compared with quarter and three-quarter dioptre powers, and that there was no enforced rounding due to nonavailability of powers. By comparing the proportion of lenses from the 2 power groups, the proportion of lenses rounded to the nearest half dioptre was estimated. It was assumed that half the difference between the totals of the 2 power groups represented these lenses dispensed to the nearest half dioptre and, therefore, dispensed inaccurately; this was termed the "rounding rate" (RR).
Results: The power distribution curve for the sphere powers spiked in half dioptre steps, illustrated a bias toward prescribing full and half dioptre

The contact lens industry has long been perplexed and bemused by inconsistencies in the prescribing of soft contact lens sphere powers. Full and half dioptre powers are prescribed more frequently than quarter and three-quarter dioptre powers. There is also some evidence of this in the prescribing of spectacle lenses.[1,2] Clearly, this arises through some practitioners rounding to the nearest half dioptre. This is seen by some as evidence for the acceptability of wide power tolerances and for providing lenses in only half dioptre steps. Compromises in the correction of astigmatism is a recognized feature of soft contact lens practice; however, as far as we are aware, approximations in the prescribing of contact lens sphere powers has not previously been discussed in the literature.

The purpose of this analysis was to gain a better insight into current prescribing habits. In particular, to determine the proportion of prescribed lenses rounded to the nearest half dioptre. Also, whether these anomalous prescribing habits vary from country to country and from product to product.

Uncorrected astigmatism

Rounding of spheres *

Latent hyperopia

Monovision

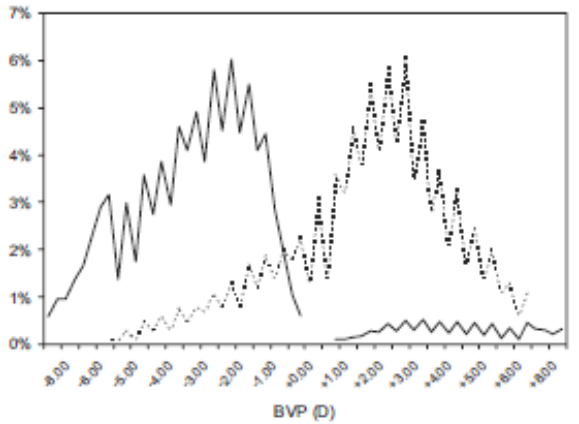


FIG. 1. Distribution of powers for mid-water hydrogel sphere contact lenses supplied in Europe (*solid line*). Historic data[2] for spectacle lenses prescribed in the United Kingdom are shown for comparison (*dashed line*).

Highlight visual benefits of CLs, and similarities between spex & CLs - but if vision not fully corrected, it can impact CL success

* Young G, Moody K & Sulley A , Anomalies in prescribing soft CL Power. ECL 2009 35:1 11-14

Results: the practitioners' view

Patient characteristics who is significantly more likely to remain in CLs after 1 year

Retention was NOT influenced by…

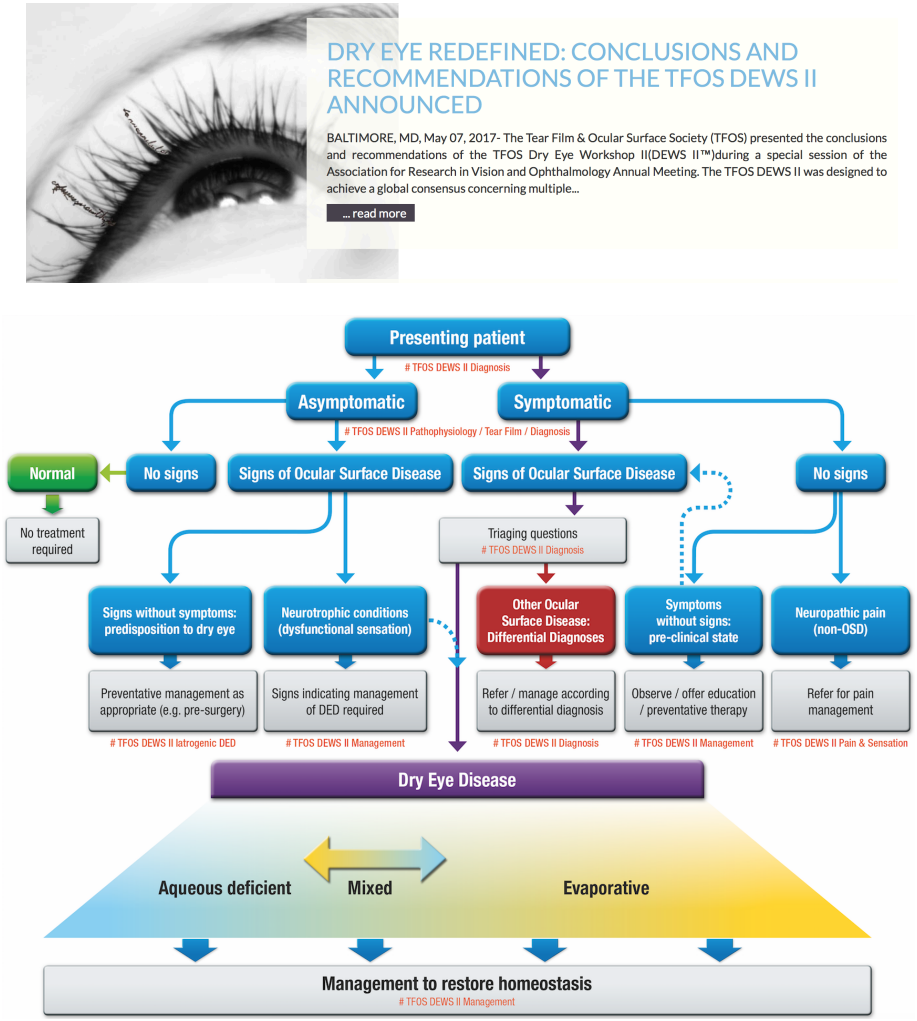
Type or location of practice

Although there were WIDE differences between individual practices…

Sulley A , Young G and Hunt C. Factors in the success of new contact lens wearers. Cont Lens Anterior Eye 2016;40:1 15-24.

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 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

Contents lists available at ScienceDirect

The Ocular Surface

journal homepage: www.theocularsurface.com

TFOS DEWS II Epidemiology Report

Fiona Stapleton, MCOptom, PhD [a, 1, *], Monica Alves, MD, PhD [b], Vatinee Y. Bunya, MD [c], Isabelle Jalbert, OD, PhD [a], Kaevalin Lekhanont, MD [d], Florence Malet, MD [e], Kyung-Sun Na, MD, PhD [f], Debra Schaumberg, ScD, OD [g, h], Miki Uchino, MD, PhD [i], Jelle Vehof, MD, PhD [j, k, l], Eloy Viso, MD, PhD [m], Susan Vitale, PhD, MHS [n], Lyndon Jones, FCOptom, PhD [o]

Table 1
Summary of population based cross sectional epidemiological studies of dry eye, stratified by diagnostic criteria and racial group.

WHS Criteria (Severe symptoms of dryness and irritation either constantly or often, and/or a physician diagnosis of dry eye as volunteered by patient)

Authors	Country	N	Age (mean ± SD)	M:F (%, (n))	Race	Sampling technique	Prevalence (% [95%CI])	Prevalence (% [95%CI]) (Symptoms only)	Prevalence (% [95%CI]) Physician diagnosis
Uchino 2008 [8]	Japan	3433	15–18	74.4:25.6 (2848:585)	1	Japanese high school students, 100% consent of those invited	n/a	Boys 21 [20.1–21.8]; Girls 24.4 [23.9–25.0]	Boys 4.3 [3.9–4.6]; Girls 8.0 [7.4–8.4]
Schaumberg 2009 [9]	USA	25444	50-09 (Median 64.4)	100% Male	3	Participants from longitudinal Physicians Health Studies I (N = 18596) and II (N = 6848). All physicians in AMA invited to participate	Age adjusted 4.34 [4.1–4.6]; 50–54 3.90 [3.1–4.7]; 80 < 7.67 [6.5–8.9]	6.8 [6.5–7.1]	3.0 [2.8–3.2]
Uchino 2011 [10]	Japan	3294	≥40	46.2:53.8 (1221:1423)	1	Rural mountain town population sampled from residential registry. Self- administered questionnaire distributed and later collected from individual households	Men 12.5 [10.7–14.5]; Women 21.6 [19.5–23.9]	Men 11.5 [9.7–13.4]; Women 18.7 [16.7–20.8]	Men 2.0 [1.3–3.0]; Women 7.9 [6.6–9.5]
Zhang 2012 [11]	China	1885	n/a	50.8:49.2	1	Multistage stratified random cluster sampling of Chinese high school students	23.7 [21.8–25.7]	23.1 [21.3–25.1]	1.3 [0.9–2.0]
Ahn 2014 [12]	South Korea	11666	19-95 (49.9 ± 16.7)	42.8:57.2	1	Stratified, multistage, clustered sampling method based on 2009 National Resident demographics. Weighted prevalence calculated per 5th annual Korea National Health and Nutrition Examination Survey [KNHANES V]	16 [14.6–17.3] Men > 40 10.7 [9.1–12.2] Women > 40 20.6 [18.5–22.2]	14.4 [13.1–15.7]	8.0 [7.3–8.7]
Um 2014 [13]	South Korea	16431	≥30	42.8:57.2 (7033:9398)	1	Stratified multistage probability sampling, subjects selected from KNHANES V	n/a	All 17.7 [17.09–18.31]; Men 9.84 [9.83–9.85]; Women 19.44 [19.42 –19.46]	All 10.4 [9.92–10.88]; Men 4.60 [4.59–4.61]; Women 12.65 [12.63 –12.67]

Authors	Country	N	Age (mean ± SD)	M:F (%, (n))	Race	Sampling technique	Diagnostic criteria	Prevalence (% [95%CI])
Symptomatic disease								
Lu 2008 [14]	China	2632	≥40 (56.3 ± 12.3)	56:44	1	Stratified, clustered, random sampling	One or more symptoms of dry eye often or all the time.	52.4 [50.2–54.7]; Men 52.1; Women 52.9
Moss 2008 [15] = INCIDENCE STUDY	USA	2414	48-91 (63 ± 10)	44:56	3	5 and 10 year follow up examinations in Beaver Dam Eye Study population	Positive response to the question, "for the past 3 months or longer, have you had dry eyes? "foreign body sensation with itching and burning, sandy feeling, not related to allergy"	All 21.6 [19.9–23.3]; Men 17.2; Women 25.0
Jie 2009 [16]	China	1957	40-84 (56.5 ± 9.3)	43.2:56.8 (835:1112)	1	From the 4439 participants in the Beijing Eye Study 2001, a random sample of 1957 were selected	One or more symptoms of dry eye often or all the time.	21 [19.2–22.8]
Tian 2009 [17]	China	1085	20-95 (51 ± 18)	38.6:61.4 (419:666)	1	6% of the target population from Jiangning District, Shanghai, was randomly selected (1286 subjects) using randomized block methods	One or more of 6 dry eye symptoms often/constantly (dryness, irritation, burning sensation, redness, deposits, heavy eyelid sensation)	32.81 [30.08–35.66]
Tong 2009 [18]	Singapore	3280	40–80	1576:1704	2	Age-stratified (by 10-year age group) random sample of the Malay population residing in 15 residential districts in Southwestern Singapore drawn from a random list of 16,069 Malay names provided by the Ministry of Home Affairs	One or more of 6 listed symptoms of dry eye often or all the time.	6.5 [5.7–7.4]; Men 8.2 [6.9–9.7]; Women 4.9 [3.9–6.0]
Guo 2010 [19]	China	1816	≥40 (54.9 ± 11.7)	53.3:46.7	1	Stratified, clustered, random sampling method in Henan County China. Native Mongolian population living at high altitude.	One or more of the 6 symptoms of dry eye often or all the time.	50.1 [47.8–52.4]; Men 49.8[46.8 –53.1]; Women 50.2[46.8–53.6]
Han 2011 [20]	South Korea	657	65-95 (72 ± 5.9)	48.2:51.8	1	10% of the population chosen through systematic random sampling based on residential rosters; 1060 invited to participate, 657 consented	One or more symptoms of dry eye often or all the time (dry, gritty/sandy, burning, sticky, watery/tearing, redness).	30.3 [26.9–33.9] Men 25.6; Women 34.7

(continued on next page)

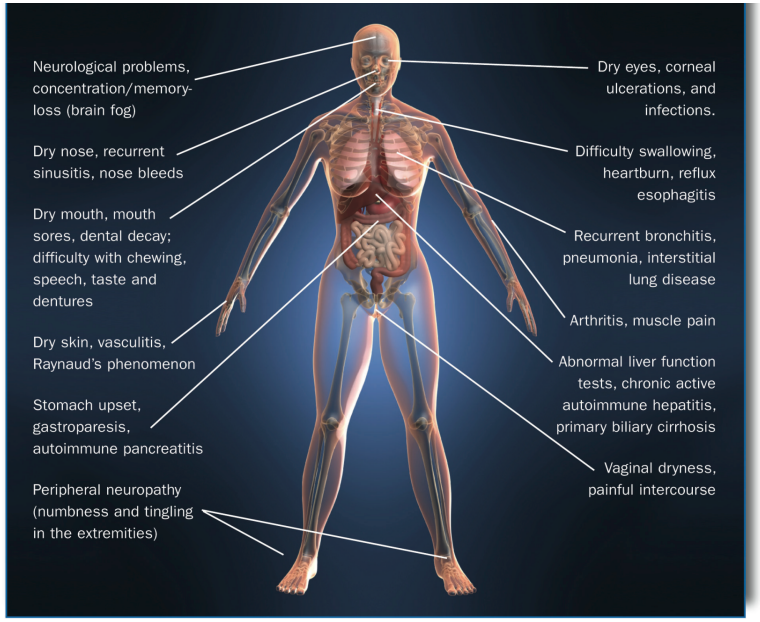
Dry Eye Prevalence

TWIN CITIES OCULAR SURFACE DISEASE SYMPOSIUM

- Prevalence is much higher among women
- Aging is a risk factor
- Sex hormones are key factors
- Changing hormone levels / decreased androgens are contributory

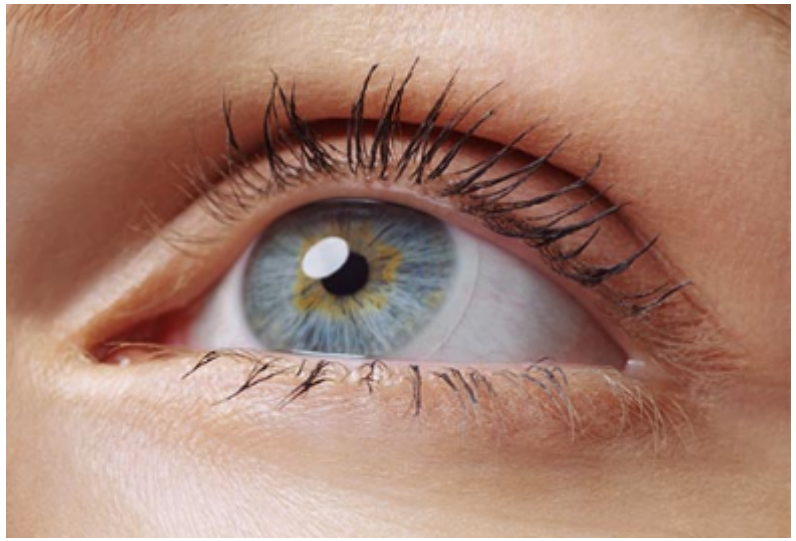
Dry Eye Workshop 2007
Delphi Panel 2006
Intrinsic Risk Factors for Dry Eye

- Female gender
- Older age
- Altered hormone levels / decreased androgens
- Hormone replacement therapy
- Autoimmune disorders and dry eye
  - Rheumatoid arthritis
  - Sjögren's Syndrome



Dry Eye Workshop 2007
Delphi Panel 2006
Extrinsic Risk Factors for Dry Eye

- Postmenopausal estrogen therapy
- Medications
- Vitamin A deficiency
- Environment
- Diet low in Omega 3 / 6
- Refractive surgery
- Contact lens wear*



Contact Lens Wear
An Independent Risk Factor for DED

- Presence of a CL on the eye may lead to dryness
- CL segregates tear film into:
  - Pre-lens & post-lens layers
  - Bulk of tear behind lens

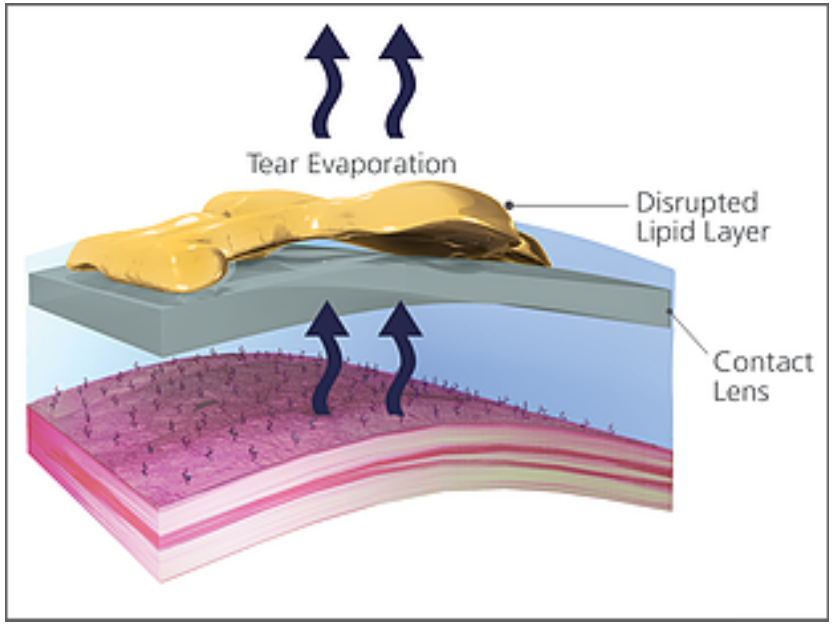


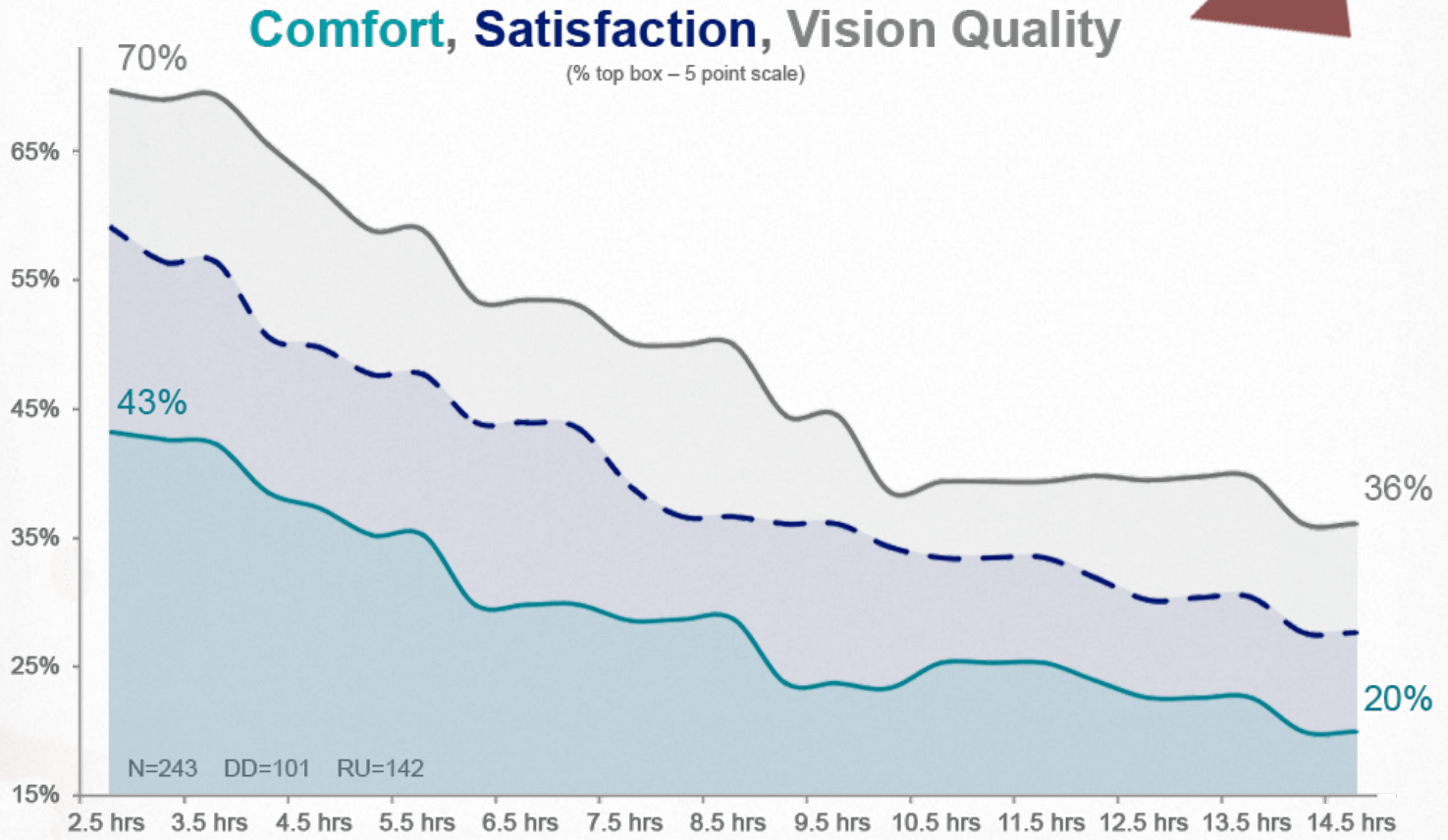
Photo Credit: Tangible Science

A Day Full of Activities can Destabilize the Tear Film

59% of ALL wearers showed a pattern of **declining performance**

Decliners more likely to have **MORE activities** and **MORE changes in demands**

78% OF CONTACT LENS WEARERS REPORT FEELINGS OF **TIRED EYES**[1]



*Data on file. In a patient survey, 59% of patients experienced an overall decline in lens performance throughout the day.
1. JJVC data on file 2015. Performance throughout the day for ACUVUE OASYS® with HydraLuxe™ Technology 1-Day.

Slide courtesy of JJVCI

*Performance was based on 243 patients who reported vision, comfort, and satisfaction as assessed on a 5-point scale every 2 hours throughout the day.

TFOS CL Discomfort Classification

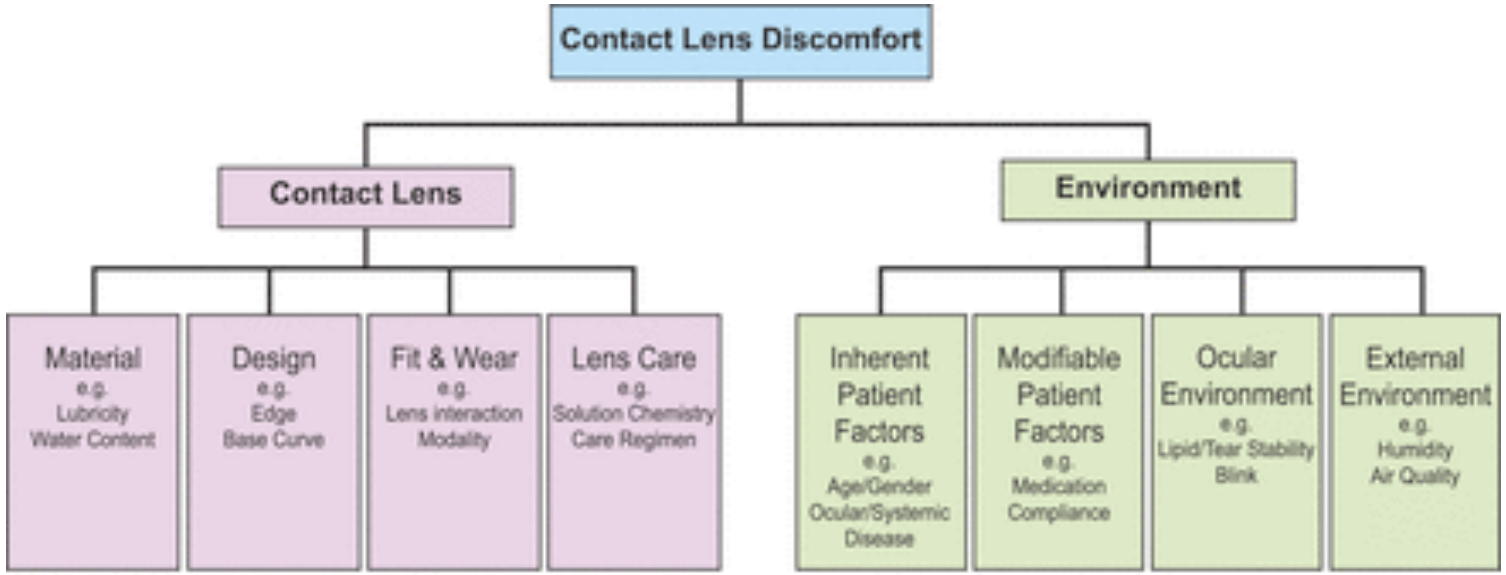
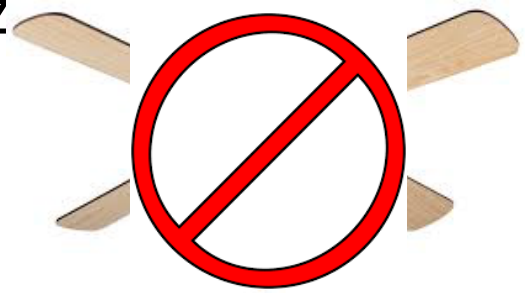


Figure courtesy of TFOS

TFOS CL Discomfort Management

- Change care solution or care system
- Eliminate care-system / change to daily disposable
- Adjust replacement frequency
- Change lens design and / or material
- Tear supplementation
- Dietary supplementation
- Topical medication (Az
- Improve environment



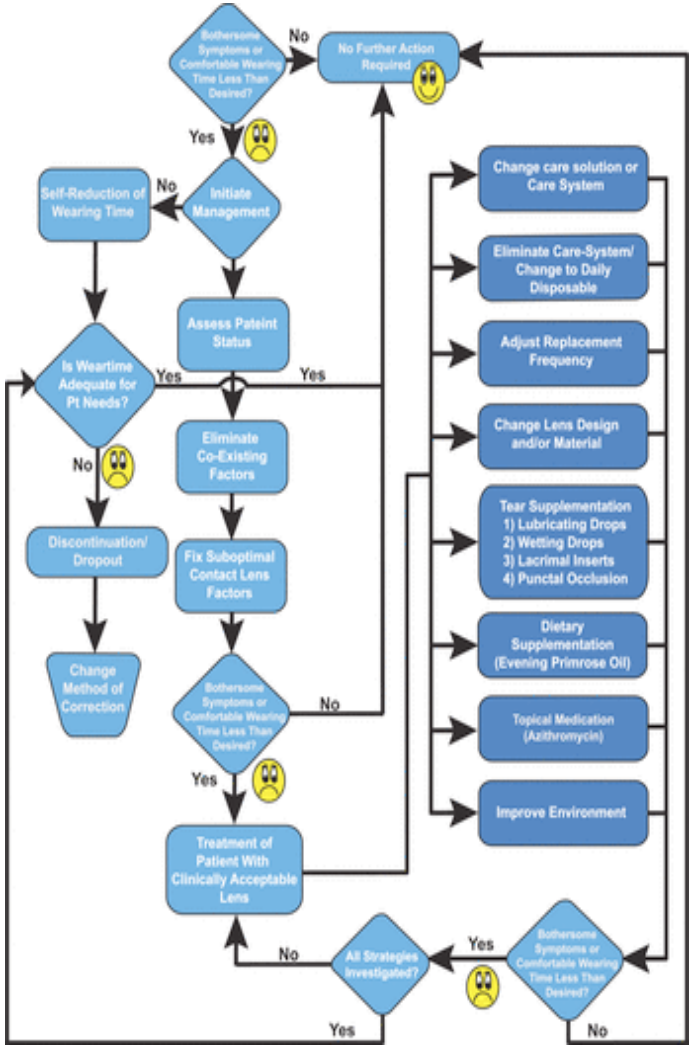
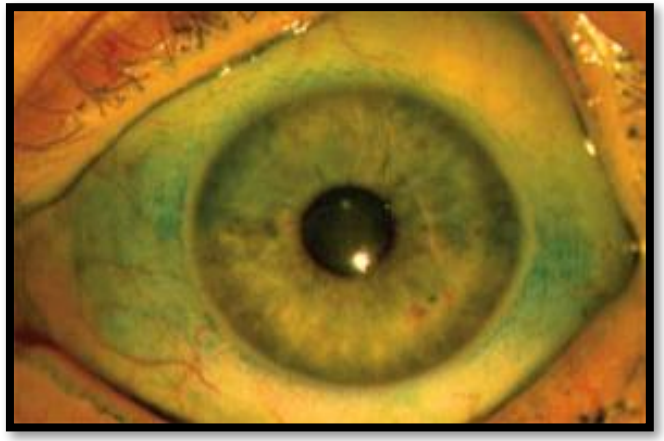


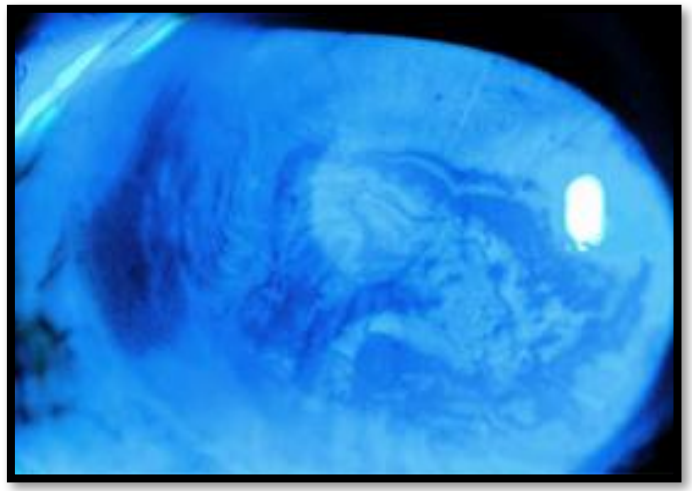
Figure courtesy of TFOS

Identify & Treat DED Prior to Fitting Patient in CLs – Making the Diagnosis

- Symptoms – often poor correlation between symptoms & severity dry eye disease (DED)
  - Sullivan et al: Only 57% of individuals w/ clinical signs of DED were symptomatic
- Evaluate the ocular surface & tear film

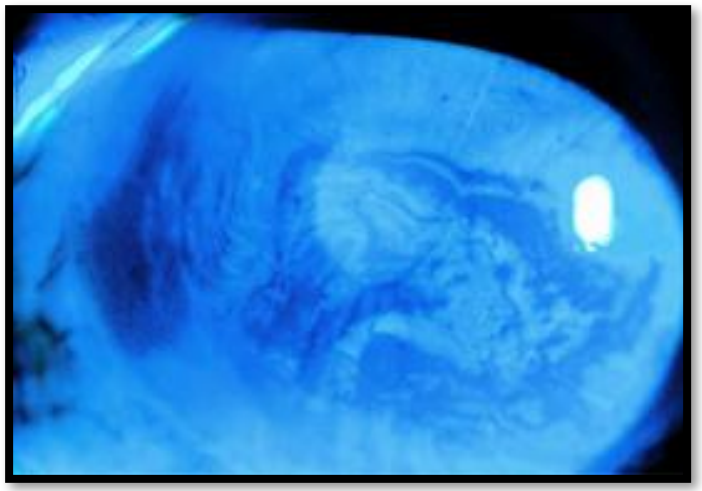
Ocular Testing



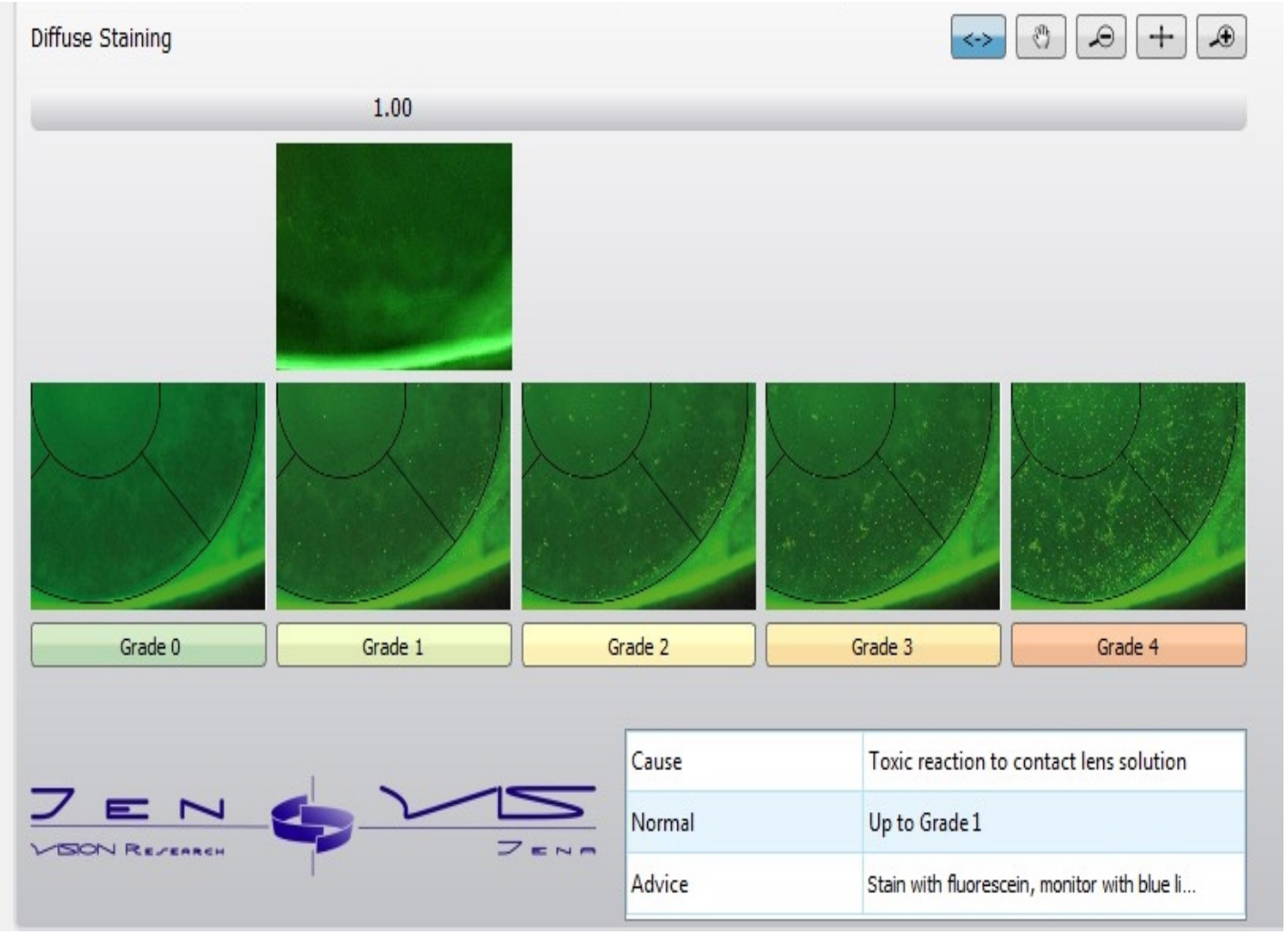


Tear Film Stability

- **Tear Film Stability – TBUT**
    - Correlates with aqueous and evaporative tear deficiency
    - Fluorescein strip
    - Time to blink until first dry spot
    - Less 10 seconds abnormal
    - Note - anesthesia decreases TBUT

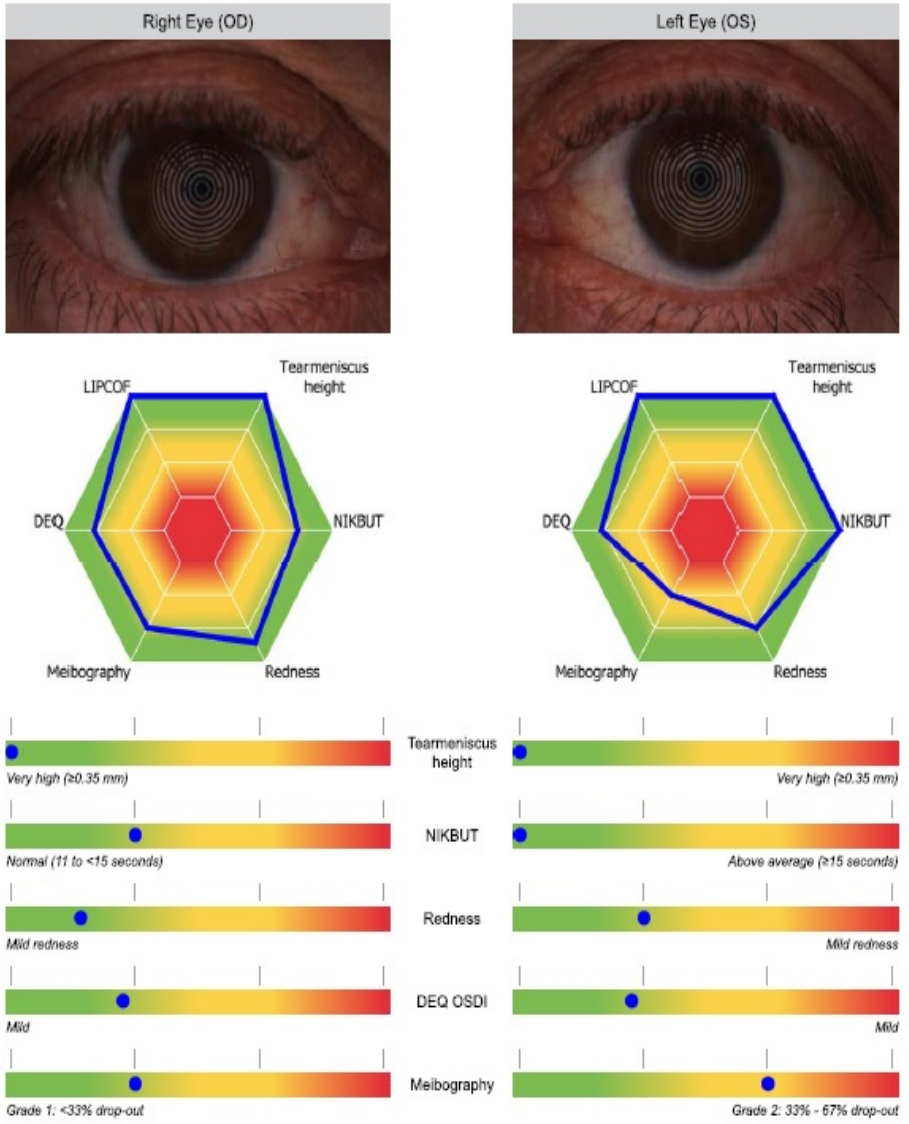


Oculus Keratograph 5M Non-Invasive Technology - Observe, Document & Grade Staining Patterns



DRY EYE REPORT

Summary of Findings
Easy to Understand



Allergies

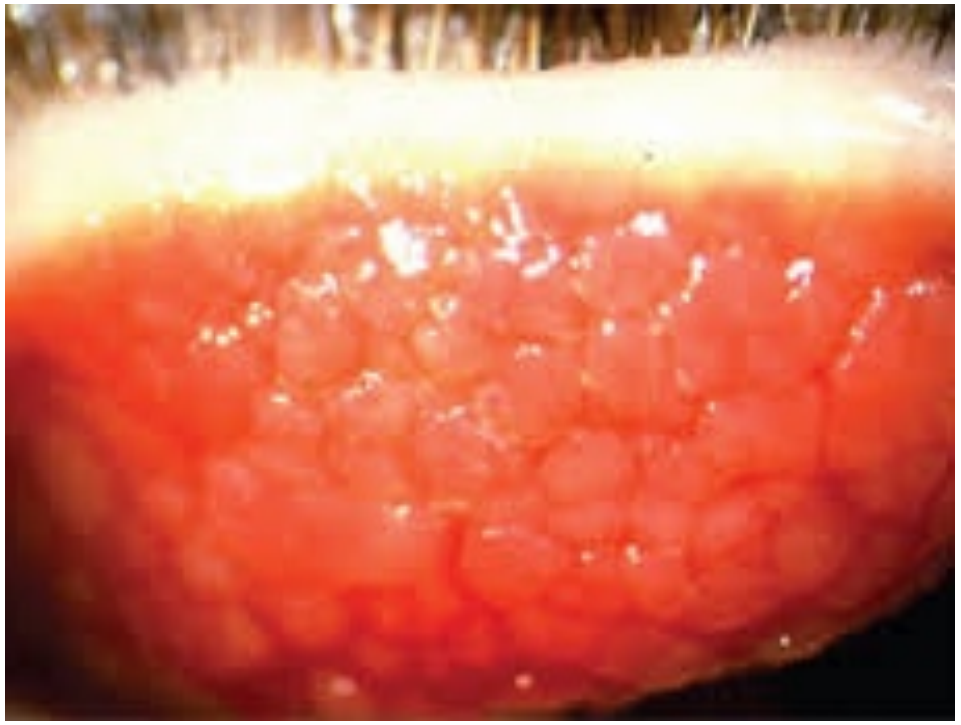
- Increasingly prevalent
- Affect as many as 30% of adults and 40% of children
- 5th leading chronic condition in industrialized countries for all ages
- 3rd most common chronic disease in children under 18 years old
- Eye-related allergies may affect contact lens wear

GPC

- Giant Papillary Conjunctivitis
- Primary and secondary forms
  - Vernal keratoconjunctivitis (VKC)
  - Atopic keratoconjunctivitis (AKC)
- Secondary
  - Contact lenses
  - Ocular prostheses
  - Exposed sutures
- All forms at least partially caused by chronic ocular allergy

CL related GPC

- Symptoms
  - Redness
  - Heaviness
  - Swelling of the lids
  - Mucopurulent discharge
  - Excessive contact lens movement
  - CL intolerance
- Treatments
  - Topical
  - Avoid allergen
  - Wash face / shower
  - Remove shoes



Lid Wiper Epitheliopathy

- 100 patients
- Two groups with or without dry eye symptoms
- TBUT of 10 seconds or more
- Schirmer test value of 10mm or more
- Absence of fluorescein corneal staining

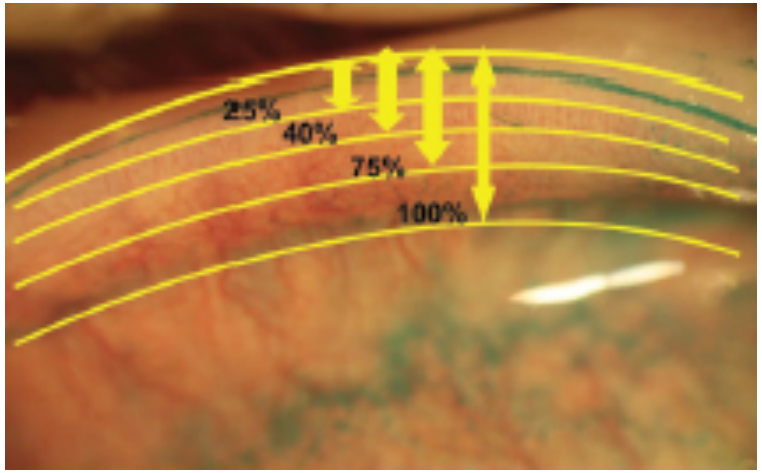
Lid Wiper Epitheliopathy and Dry Eye Symptoms. Korb, et al.
Eye & Contact Lens: Science & Clinical Practice: January 2005 - Volume 31 - Issue 1 - pp 2-8

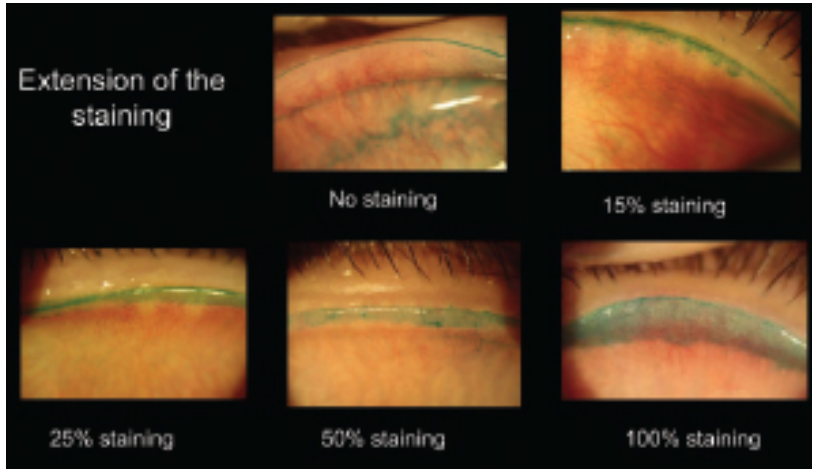
Lid Wiper Epitheliopathy

- In symptomatic patients – 76% staining of lid wiper
  - 44% grade 1
  - 22% grade 2
  - 10% grade 3
- Asymptomatic patients – 12% staining of lid wiper
  - 8% grade 1
  - 4%, grade 2
  - 0% grade 3
- Difference in prevalence of lid wiper staining between the symptomatic and asymptomatic groups was significant ($P<0.0001$)

Lid Wiper Epitheliopathy

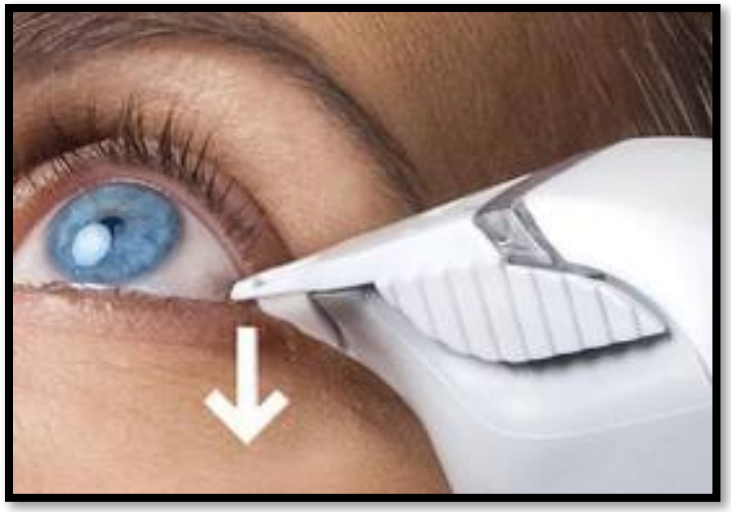
- Conclusion - lid wiper epitheliopathy
- Diagnosed by staining with fluorescein and rose bengal dyes
- Frequent finding when symptoms of dry eye are experienced in the absence of routine clinical dry eye findings.





TearLab Osmolarity

likely pathogenic >308



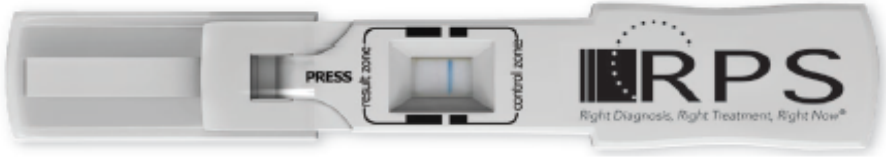
InflammaDry® Limit of Detection

POSITIVE TEST RESULT

MMP-9 ≥ 40 ng/ml

NEGATIVE TEST RESULT

MMP-9 < 40 ng/ml



InflammaDry® Limit of Detection

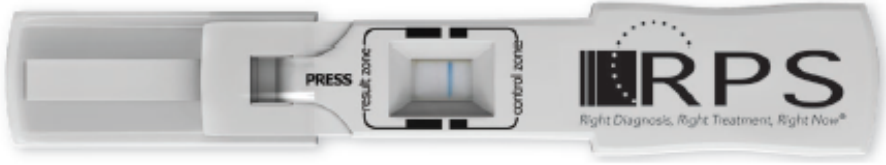
- Test similar to an at-home pregnancy test
- Takes a sample of tears
  - Positive result = ocular surface disease
  - Negative result = no ocular surface disease
- Test takes 10 minutes
- Test based amount of MMP-9 in the tears (**normal levels MMP-9 in human tears ranges from 3-41 ng/ml)**
- Red line indicates elevated MMP-9
- If positive, over 40 ng/ml of MMP-9

POSITIVE TEST RESULT

MMP-9 ≥ 40 ng/ml

NEGATIVE TEST RESULT

MMP-9 < 40 ng/ml

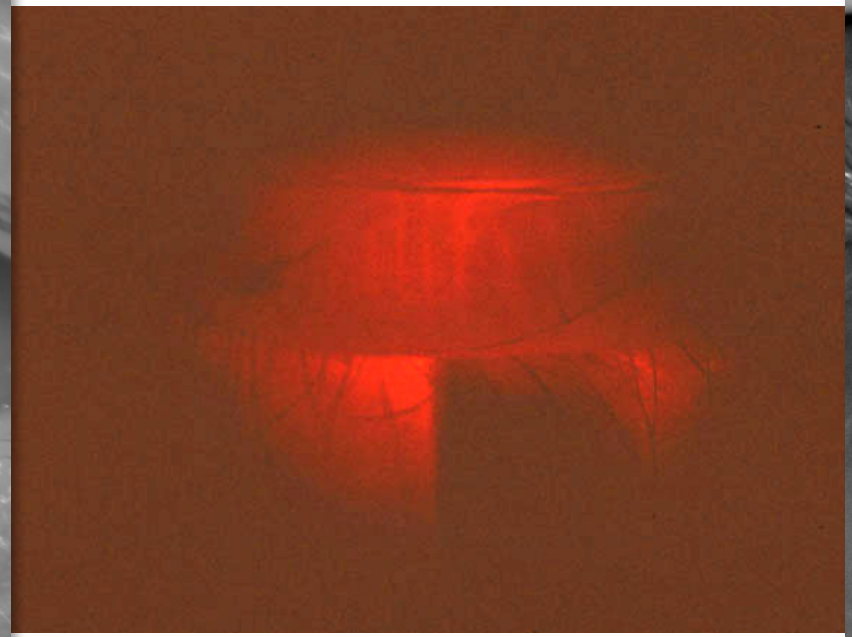


Contact Lens Wear
An Independent Risk Factor for DED, Especially MGD

- Evaluate
  - Number of glands present
  - Increased lid telangiectasia
  - MG orifice obstruction
  - Decreased quality of meibomian gland secretions
  - Meibomian gland dropout (transillumination or IR photo imaging)

Meibomian Gland Evaluation

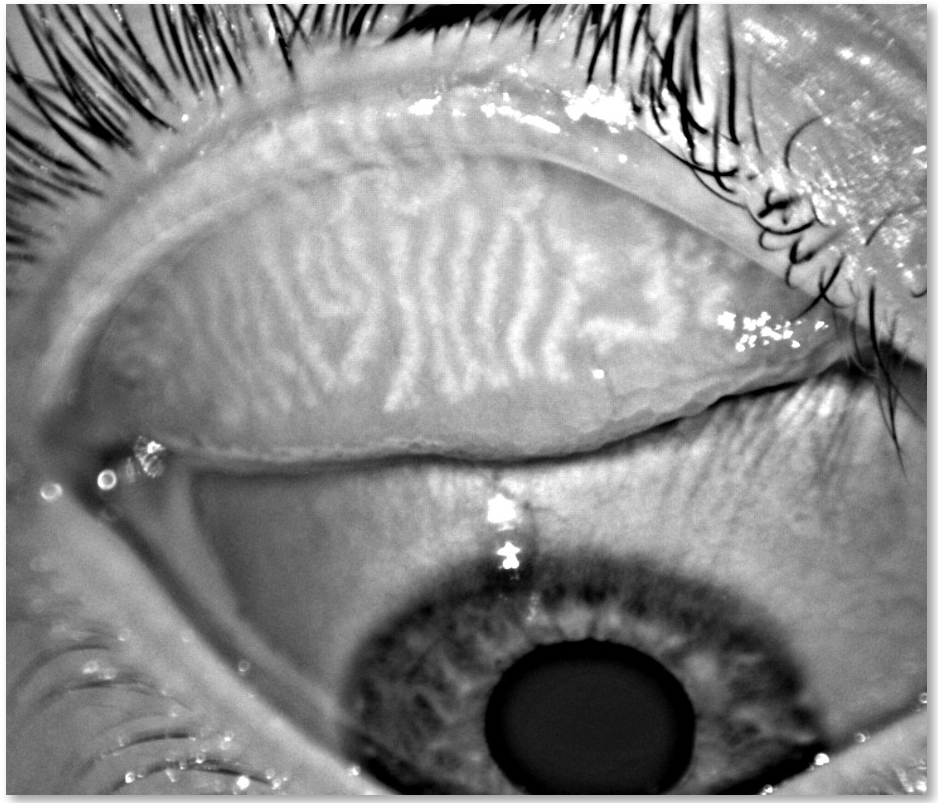
Normal Appearance



Images courtesy of Bill Townsend, OD

Meibomian Gland Evaluation

Incipient Dropout

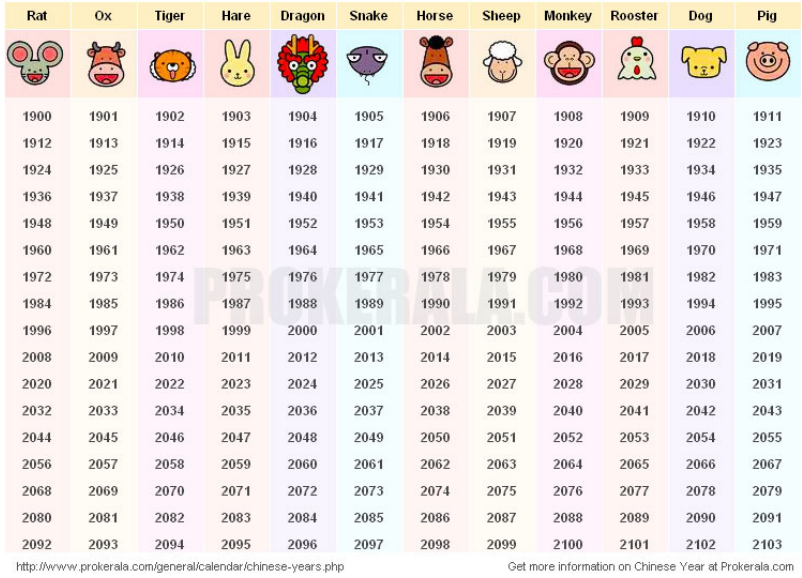


Severe Dropout

Images courtesy of Bill Townsend, OD

Preparing the Dry Eye for CL Wear
Educate

- Vital when managing chronic complex diseases
- DED – a great extent, self treated
- Patients must do much of the therapy
- Treatment lasts for weeks or months, longer



Rat	Ox	Tiger	Hare	Dragon	Snake	Horse	Sheep	Monkey	Rooster	Dog	Pig
1900	1901	1902	1903	1904	1905	1906	1907	1908	1909	1910	1911
1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923
1924	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935
1936	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947
1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959
1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043
2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055
2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067
2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079
2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091
2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103

http://www.prokerala.com/general/calendar/chinese-years.php Get more information on Chinese Year at Prokerala.com

Preparing the Dry Eye for CL Wear
Encourage

- Chronic condition affecting quality of life, long term therapy, discouraging
  - Review why contact lens wear has been delayed and expected benefits
  - Report the results of the treatment (progress)
  - Expected duration of treatment prior to CL- “light at the end of the tunnel”
  - Once lens wear initiated or resumed, keep the ocular surface healthy- ongoing treatment

Management – discomfort and dryness

- CL types – material, replacement frequency
  - DD vs RU
  - Hyd vs SiH
  - RGPs
- Care regimens
  - MPS vs H_2O_2

Examples of daily disposable lenses

TEMPO Registry

- Rates of adverse events with hydrogel and silicone hydrogel daily disposable lenses in a large post-market surveillance registry: the TEMPO Registry.

- Adverse events including corneal infiltrative events
  - 171 subjects (31.8 ± 13.5 years, 68% female)
  - 601 SiHyDD
  - 570 HydDD
- Over 1 year

Chalmers, RL, Hickson-Curran SB, Keay L, et al. Invest Ophthalmol Vis Sci. Jan 2015

TEMPO Registry

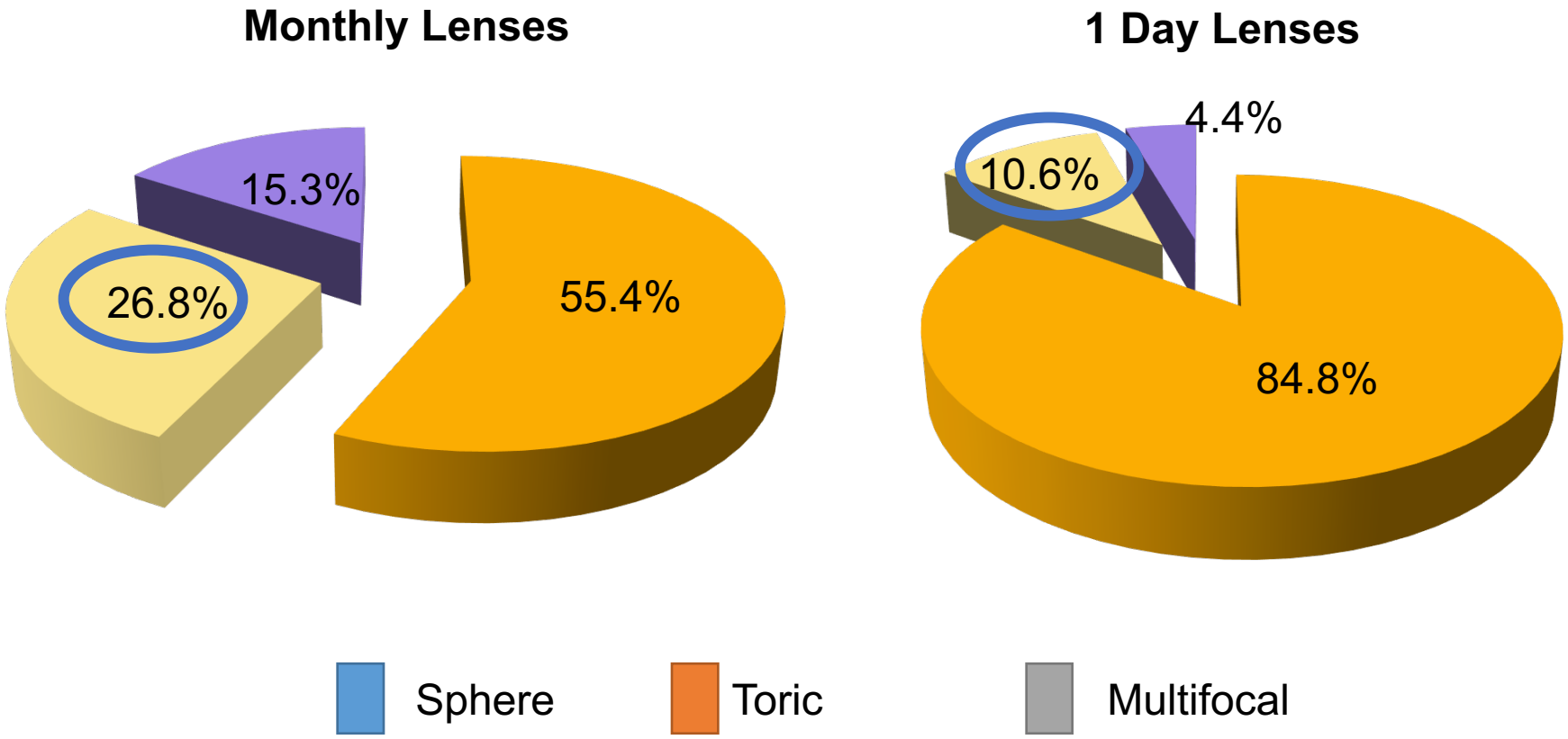
- Rates of CIEs with DD lenses

- SiHyDD 0.4% per year
- HyDD 0% per year

- Rates significantly lower than rates with reusable SCLs (3%-4% per year)
- Improved safety outcomes with DD lenses.

Chalmers, RL, Hickson-Curran SB, Keay L, et al. Invest Ophthalmol Vis Sci. Jan 2015

Combat digital eyestrain

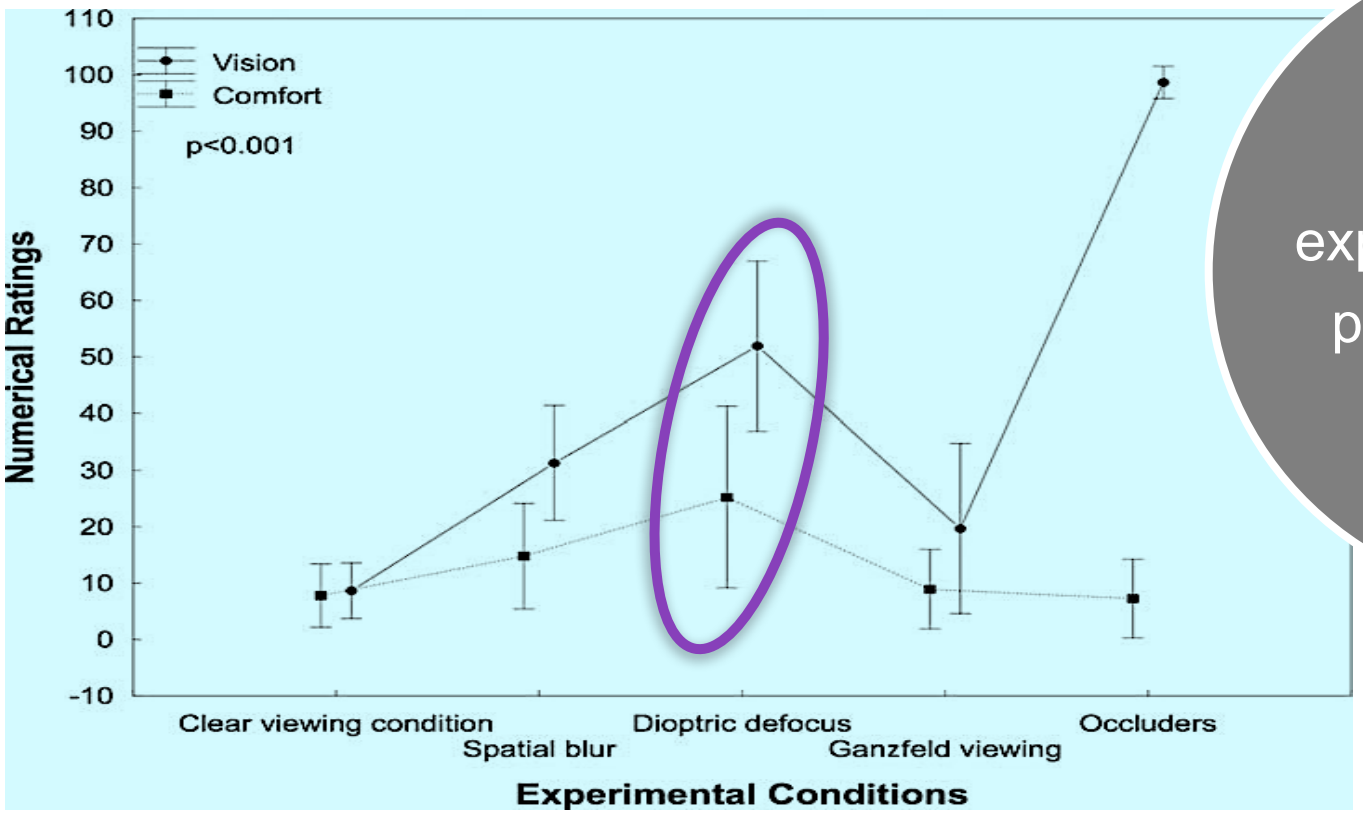


Fits By Category

Source: GFK Q3 2014 data

Importance of vision

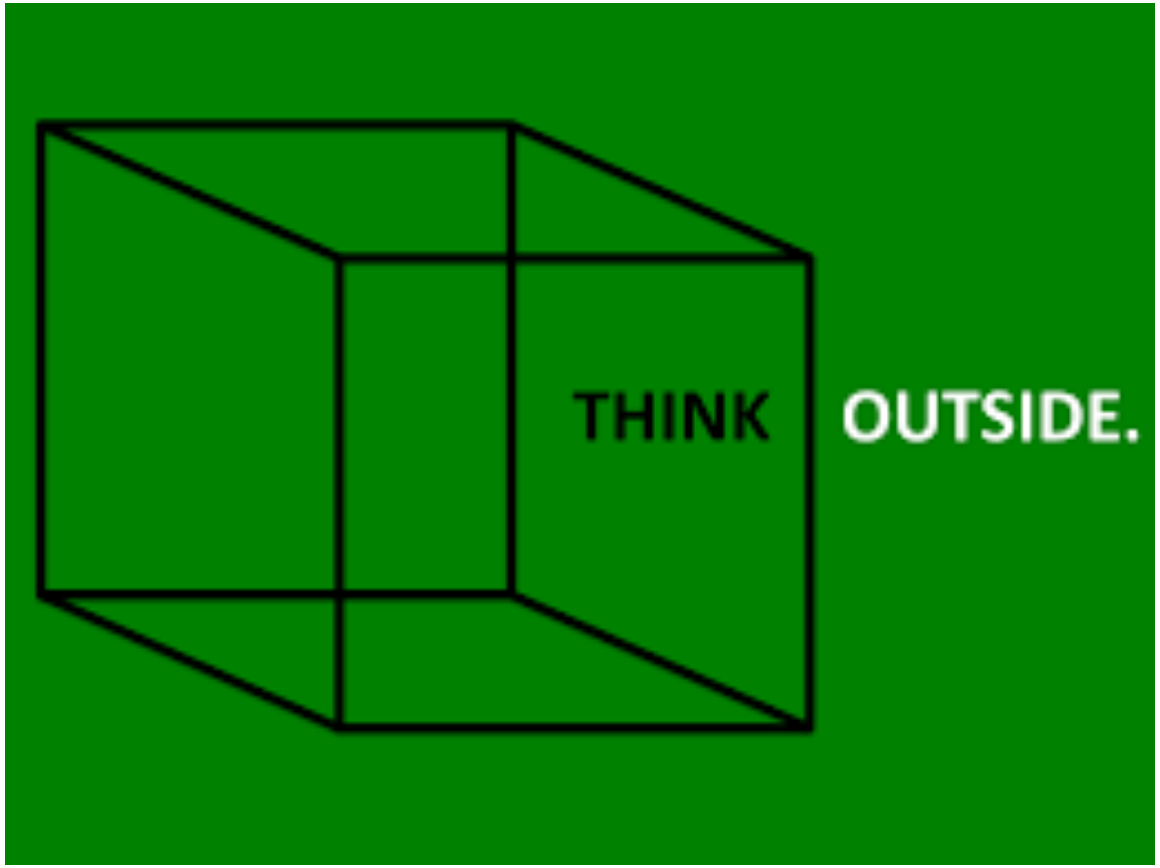
Association shown between ocular surface sensation and quality of vision[1]



Must fully understand Px experience of visual performance of lenses

After discomfort, **poor vision** is next most common reason for drop out with established wearers[2-4]

1. Rao SBS and Simpson TL. Influence of Vision on Ocular Comfort Ratings OVS 2016 93:8 793-800
2. Young G et al. A multicentre study of lapsed contact lens wearers. OPO 2002;22:516-527
3. Rumpakis J. New data on contact lens dropouts: An international perspective. Rev Optom 2010;147:1 37-40
4. Dumbleton K, Woods CA, Jones LW et al. The impact of contemporary contact lenses on contact lens discontinuation. ECL 2013;39:93-9


THINK
OUTSIDE.

Astigmatic Annoyances

85% of Patients Must Manually Reorient Toric Lenses to Regain Vision[2]

- Rub eyes
- Stick finger in eye
- Blink a lot
- Push on eyelids

While Engaged in Critical Activities

- Driving
- Working at a computer
- Participating in athletic activities
- Reading
- Laying down to read or watch TV
- Simply changing their head position

Slide courtesy of SynergEyes

Duette Patient Candidates

- Astigmats

- Any patient seeking better vision

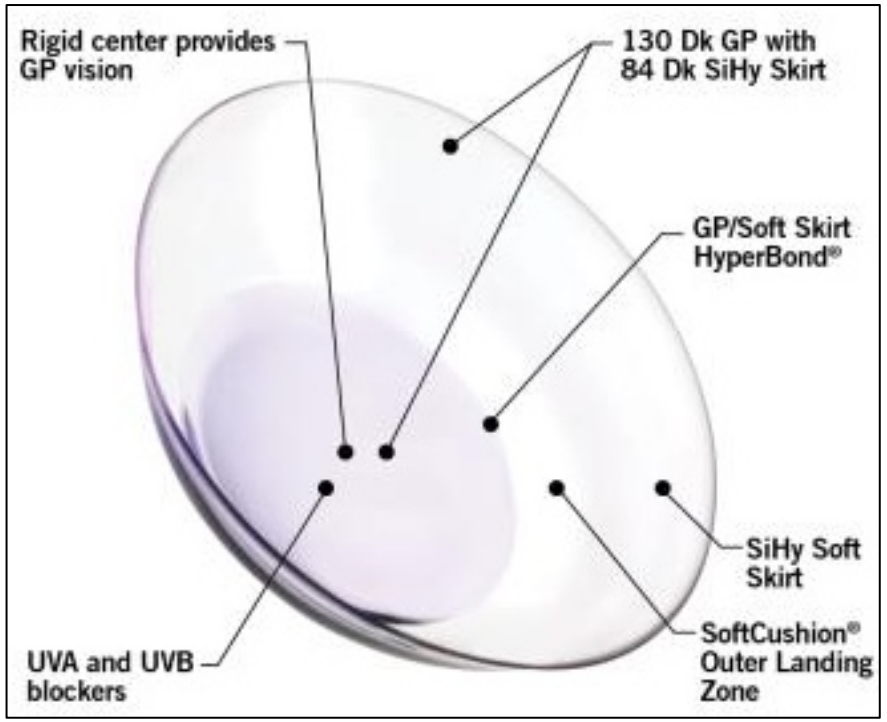
- Patients who:
  - notice blur due to soft toric lens rotation
  - would like to eliminate halos and glare at night
  - want to see as well in their contacts as they do in their glasses
- Contact lens dropouts due to poor acuity

- Occupations or hobbies that demand great vision
  - Anybody whose work requires them to look above their head (mechanics, carpenters, medical assistants)
  - People who do a lot of computer work (engineers, architects, graphic designers)
  - Anyone whose hobby requires precision (athletes, hunters)

Slide courtesy of SynergEyes

Duette

- Hybrid platform offers centration and stability; Vision Not Affected by Lens Rotation*
- Uncompromised GP Optics
- SoftCushion® Comfort Technology
- Excellent Ocular Health: 130-Dk GP center; 84-Dk silicone hydrogel soft skirt
- UVA and UVB blocker
- Straightforward Empirical Fitting
- 100% Retention of Repeat Business

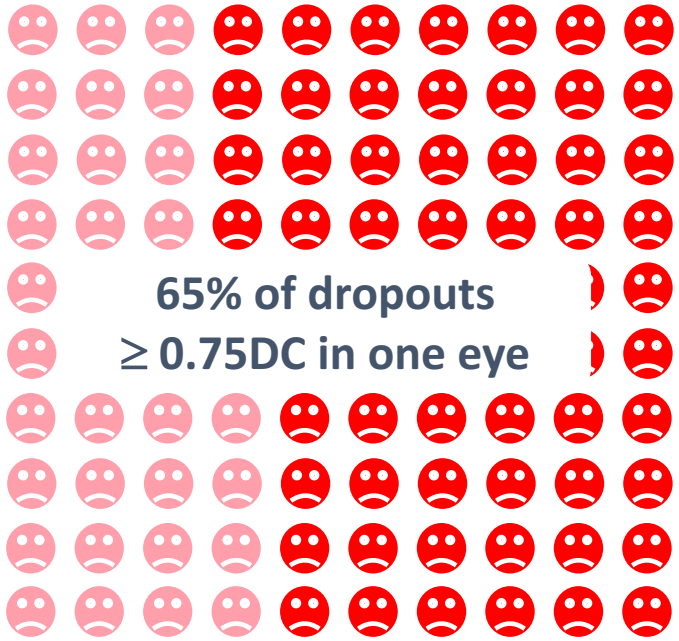


*GP optics negates corneal astigmatism; rotation of lens inconsequential

Slide courtesy of SynergEyes

Importance of vision in astigmats

What happens when astigmats are not optimally corrected with CLs?



Historically, **high %** drop outs astigmatic[1]

Astigmats remain **over-indexed** in the dropout population[1-3] and toric CLs are still **under-prescribed**[4]

However: a very high proportion of astigmats (including dropouts) can be **successfully refitted**[5] and toric lenses can deliver additional **visual quality of life benefits**[6]

1.Young G, Veys J, Pritchard N et al. A multicentre study of lapsed contact lens wearers. Ophthal Physiol Opt 2002;22:516-527 2. Young G. Why one million contact lens wearers dropped out. Cont Lens Anterior Eye 2004;27:83-85 3. Canavan K, Coles-Brennan C, Butterfield R et al. Multi-center clinical evaluation of lapsed wearers refitted with senofilcon A contact lenses. Optom Vis Sci 2014. E-abstract 145180 4. Young G, Sulley A and Hunt C. Prevalence of astigmatism in relation to soft contact lens usage. Eye & Contact Lens 2011;37: 20-25 5. Sulley A, Young G, Lorenz KO et al. Clinical evaluation of fitting toric soft lenses to current non-users. Ophthal Physiol Opt 2013;33:2 94-103. 6. Nichols J, Berntsen D, Bickle K et al. A comparison of toric and spherical soft contact lenses on visual quality of life and ease of fitting in astigmatic patients. Paper presentation at Nederlands Contactlens Congres, March 2016

Correct the Cylinder

- Low astigmatic eyes
    - 3 to 5.5 letters of acuity gained with toric contact lenses vs. spherical lenses
- Moderate astigmatic eyes
    - 8 to 12.5 letters of acuity gained with toric lenses
- Both groups showed improvements in acuity with toric contact lenses

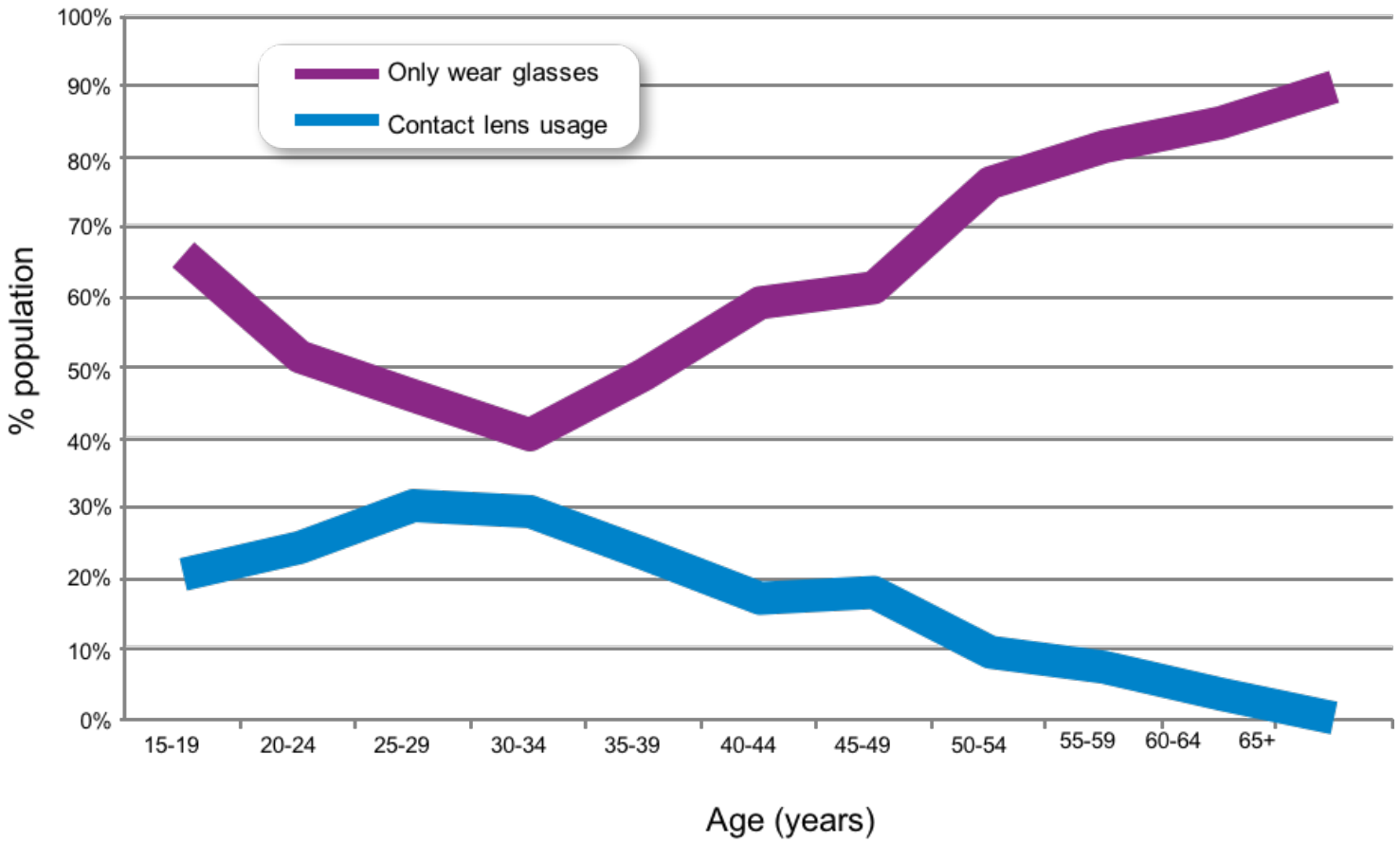
Richdale K, Berntsen DA, Mack CJ, et al. Visual acuity with spherical and toric soft contact lenses in low- to moderate-astigmatic eyes. Optom Vis Sci. 2007 Oct;84(10):969-75.

Correct the cylinder

- Compared the visual outcome of spherical and toric lenses in patients with low astigmatism
- 41 subjects
- Monocular and binocular high and low contrast logMAR visual acuities were significantly better with toric lenses compared with the spherical lenses ($p < 0.01$).
- Significant improvement in both subjective and objective vision with toric lenses compared with spherical lenses.

Cho P, Cheung SW, Charm J. Clin Exp Optom. Visual outcome of Soflens Daily Disposable and Soflens Daily Disposable for Astigmatism in subjects with low astigmatism. 2012 Jan;95(1):43-7. Epub 2011 Nov 25.

Huge opportunity for CLs as ametropia increases

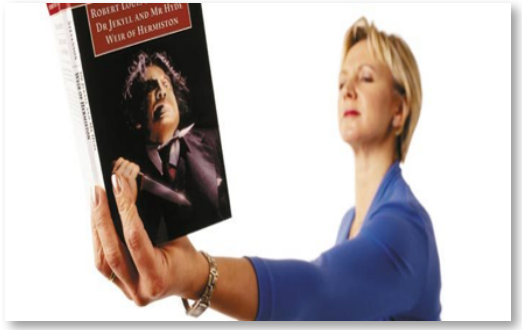


Ametropia **doubles** past 45 years[1]

Half of CL wearers drop out past 45 years

1. Independent market research, 2014/15 in 7 markets including Europe and Russia N=28,700 (2014); N= 14,000 (2015)

Presbyopia: impacting everyday life



Long arm syndrome

Can’t read menu

Magnifying mirror

Missing moments

Squinting at screens

Lost glasses/too many pairs

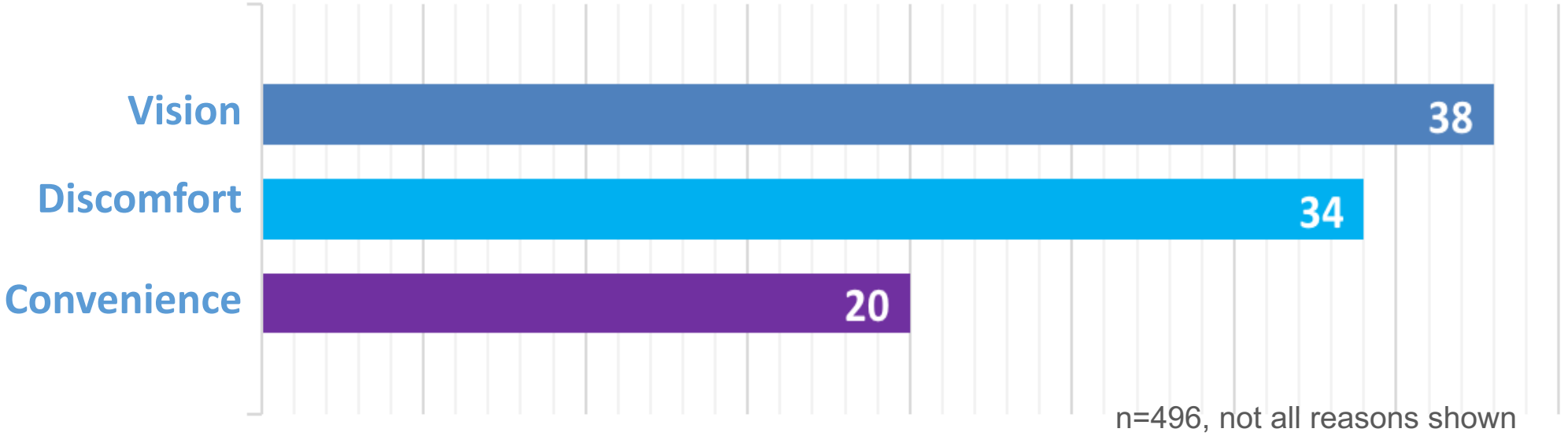
Font too big!

Seemingly small issues put together become significant

Drop out among emerging presbyopes

Recent survey 496 presbyopic patients

Reasons for presbyopic patients dropping out of lens wear, %



Those new to CL after presbyopia no more or less likely to lapse than long term wearers

Rueff EM, Varghese RJ, Brack TM et al. A survey of presbyopic contact lens wearers in a university setting. Optom Vis Sci 2016 93:8 848-854.c

How to make a difference: emerging presbyopes

Let 40 year olds know vision changes and there are CL available to help

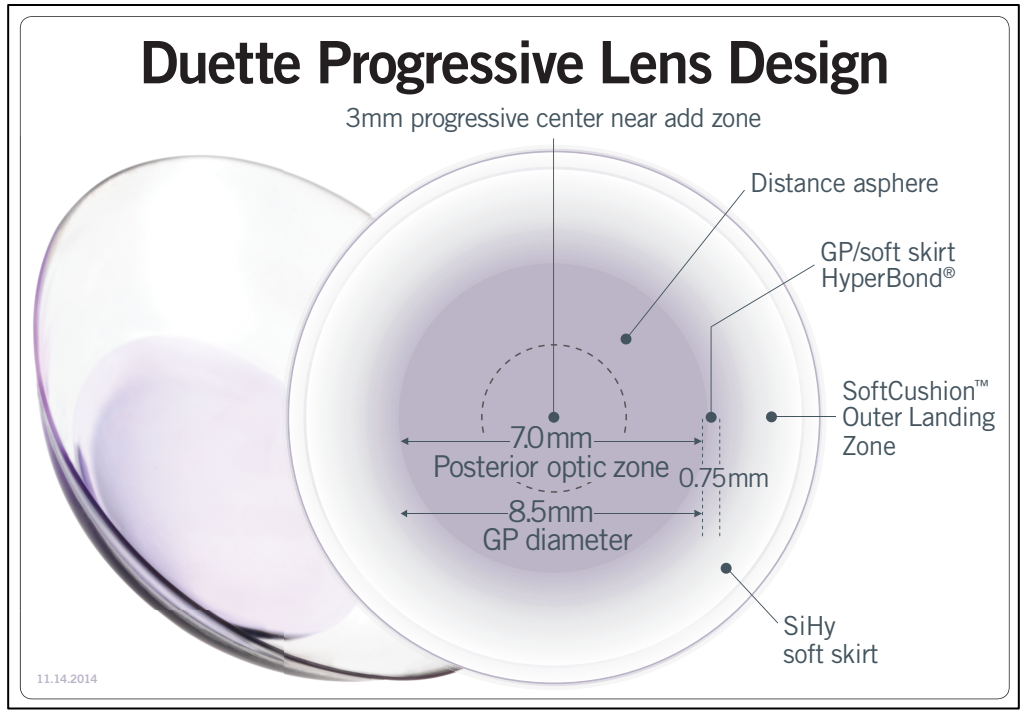
Provide both optical solutions to meet spectrum of patient needs; remember choice & convenience important

Use latest MF design and material technology and set realistic expectations

Daily Replacement Multifocals

Duette Progressive

- High performance vision for astigmatic presbyopes
- Hybrid platform offers centration and stability; Vision Not Affected by Lens Rotation*
- Uncompromised GP Optics provide a seamless progression of power from near to distance; available in three add powers
- SoftCushion® Comfort Technology
- Excellent Ocular Health: 130-Dk GP center; 84-Dk silicone hydrogel soft skirt
- UVA and UVB blocker
- Straightforward Empirical Fitting
- 100% Retention of Repeat Business

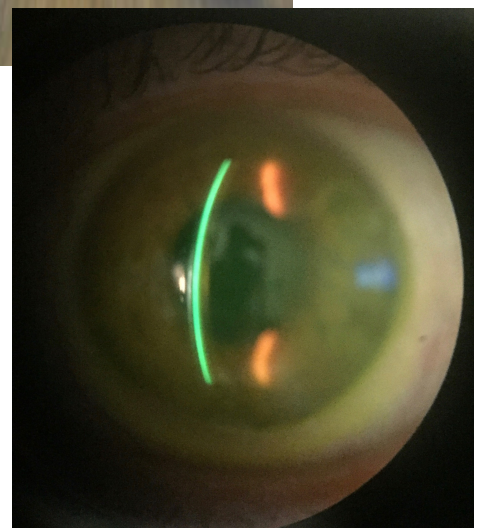


+1.00, +1.75 and +2.50 powers available

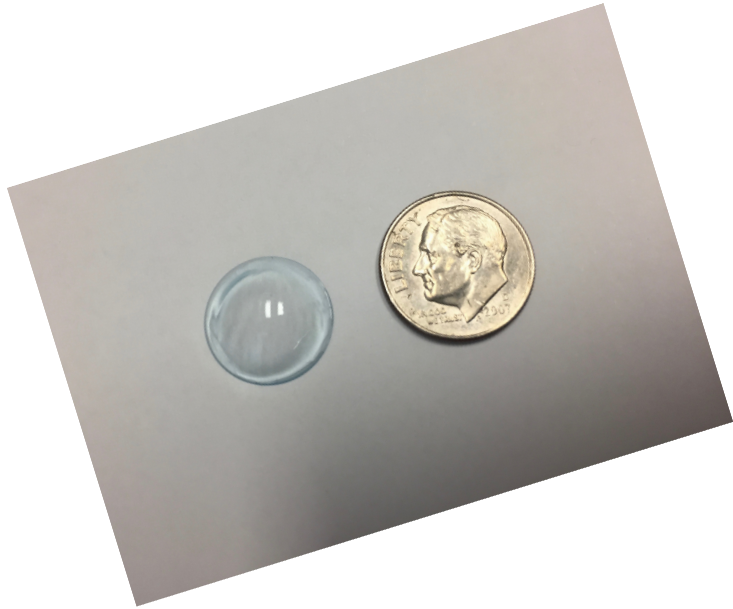
*GP optics negates corneal astigmatism; rotation of lens inconsequential

Slide courtesy of SynergEyes

Newly emerging scleral lens indications

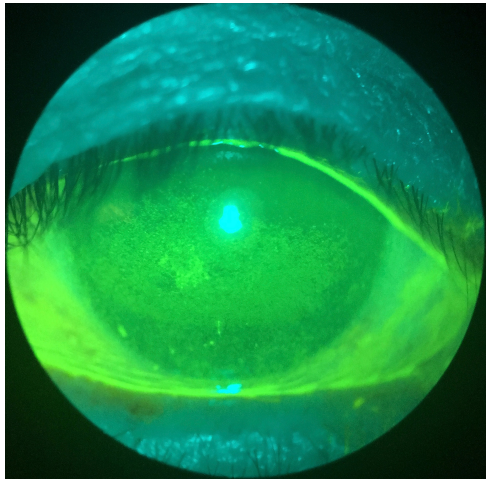


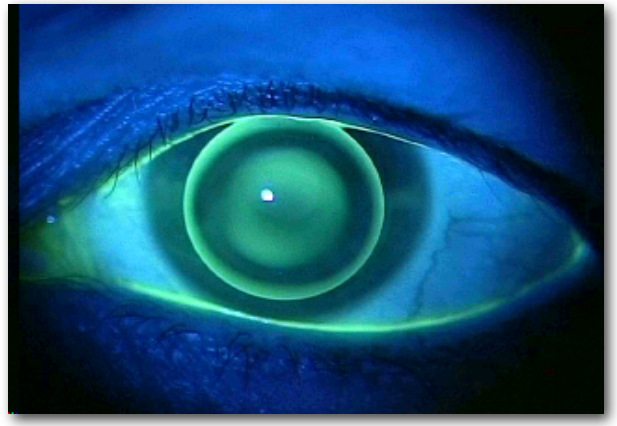
- Soft lens wearers experiencing discomfort/dryness/fluctuating vision
- High refractive errors
- Presbyopia (especially with astigmatism)
- Sports/occupation
- Allergy control



Fitting Normal Eyes

- Indications
  - Refractive error
  - Astigmatism
  - High myopia
  - High hyperopia
  - Presbyopia
  - Aphakia
  - Dry eye
  - Gas permeable contact lens intolerance
  - Piggyback patients
  - Athletes





Fitting Commonalities

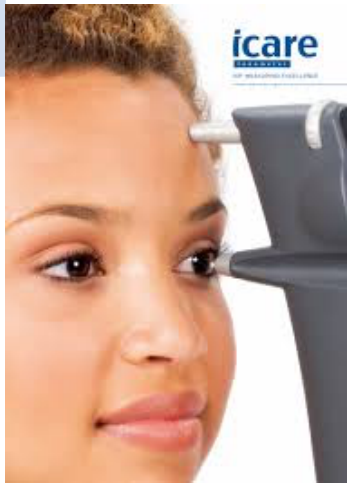
- Preservative-free solutions
- Minimal conjunctival compression
- Minimal to no conjunctival impingement
- Optimized materials for oxygen
- Daily wear
- Nightly disinfection

Alice, 21 year old female

- History of soft toric contact lens wear
- Unknown brand and prescription information of contact lenses

- Negative medical history
- No ocular medications
- No systemic medications

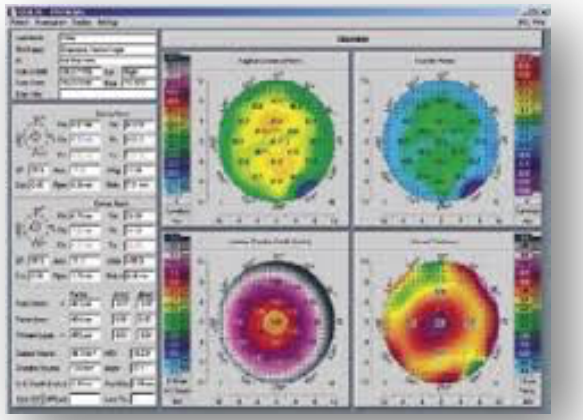
OD		OS
20/40-2	VA (CLs)	20/25-2
43.50/48.50/177	Keratometry	43.00/46.75/003
-12.50+4.50x091 20/25-2	Refraction	-8.25+6.00x112 20/30+1
	CT 6D alt XT D and N	
16 mmHg	IOP icare @ 11:16am	17 mmHg

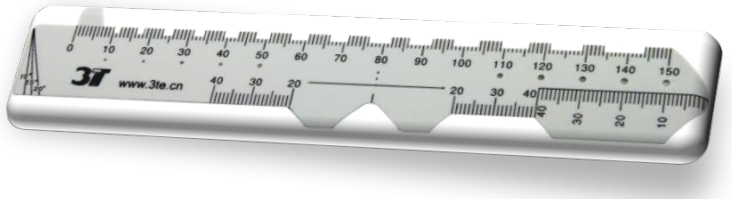


OD		OS
1+ mgd	L/L	1+ mgd
1+ superior and inferior papillae	Conj	1+ superior and inferior papillae
1+Inferior PEK	K	2+ Inferior PEK
Deep and Quiet	A/C	Deep and Quiet
Clear	Lens	Clear
0.50	C/D	0.55
Normal	Macula	Normal
Normal	Peripheral Retina	Normal

Evaluation Prior to Contact Lens Fitting

- Measure corneal diameter
  - Pd ruler
  - Topography
  - Pentacam
  - Slit lamp reticle





Alice Scleral Lenses

Scleral lenses Boston XO_2 material (B+L)

OD 43.00 / -6.00 / 14.9 / 9.0 20/20-2

Sag 4.11

OS 41.00 / -5.75 / 15.0 / 9.0 20/20-1

Sag 4.05

Binocular 20/20+2

Alice Scleral Lenses

- Fit OU
- Good central apical clearance, good peripheral fit, no blanching, no sebaceous tear debris, no surface debris
- “Everything is clear now!”
- Even driving at night is clear.

CHAPTER 6

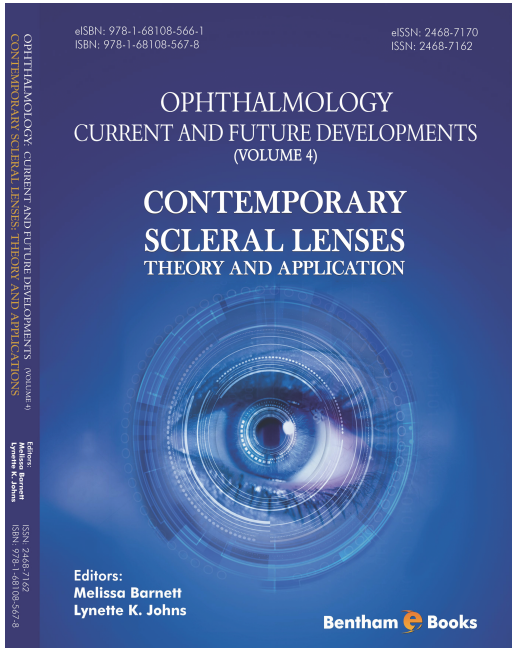
Scleral Lenses for the Regular / Normal / Non-Diseased Cornea

Langis Michaud*

École d'Optométrie, de l'Université de Montréal, Québec, Canada

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

Type	Designs	Power Range	Add Range	Diameter	Base Curve
Acculens: Maxim, Comfort SL, Easy Fit	Center near Center distance	+20.00 to -20.00D cylinder to -6.00D	+1.00 to +3.50D	14.5 to 20.5 mm	Custom
Art Optical: Ampleye	Center near	Custom	+1.00 to +3.50D	16.5mm, 16.0mm, 17.0mm	6.04 to 8.44mm
Art Optical/Dakota Sciences: SO_2 Clear	Center near	+20.00 to -20.00D in 0.25D steps	+1.00 to +3.50D in 0.25D steps	13-15mm	5.83-9.00mm
Advanced Vision Technologies: SST	Center distance	Custom	+1.00 to +3.00D	Custom	Custom
Blanchard: Onefit 2.0	Center near	+20.00 to -20.00D in 0.25D steps	Standard add of +2.25D	14.6-15.2mm	6.80-9.00mm
Essilor: Jupiter Plus	Center distance	+20.00 to -20.00D	Up to +1.75D	15-18.2mm	Custom
EyePrint Prosthetic	Center distance	Custom	Custom	Custom	Custom



CHAPTER 6

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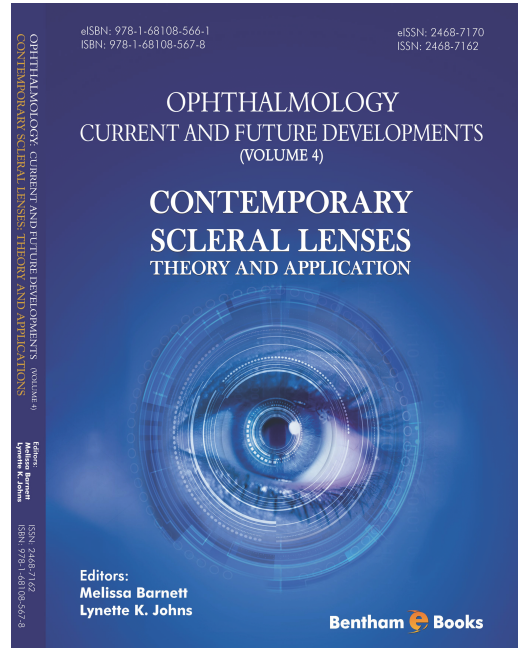
(Table 3) contd.....

Type	Designs	Power Range	Add Range	Diameter	Base Curve
Falco	Simultaneous or alternating	Custom	+0.12 to +5.00D	15-17.5mm	Custom
GP Specialists: iSight	Center near or center distance	+20.00 to -20.00D in 0.25D steps	+0.50 to +5.00D	14.2-24mm	Custom
Lens Dynamics: Dyna semi-scleral	Front aspheric	+12.00 to -20.00D	Up to +2.75D	13-16mm	5.50-8.50mm
Lens Dynamics: Dyna scleral	Front aspheric	+12.00 to -20.00D	Up to +2.75D	16.1-19mm	7.00-9.50mm
Metro Optics: InSight scleral	Center distance	Custom Cyl to 8.00D	Custom	15.2-20mm	Custom
Northern: semi-scleral	Center near for hyperopes and center distance for myopes	Custom	Up to +5.00D	14mm – 18mm	Custom
Procornea: Senso	Semi-scleral Center near or center distance	+20.00 to -25.00 in 0.25D steps	+1.00 to +2.50D in 0.50D steps	13-15mm in 0.2mm steps	6.50-9.80mm in 0.05mm steps
TruForm Optics: DigiForm	Center near	+30.00 to -30.00D	Up to +3.50D in 0.25D steps	15.0 – 18mm	Custom
Valley Contax: Custom Stable Aurora	Center near	+30.00 to -30.00D	+1.00 to +3.50D	14.8-17.8mm	Custom
Visionary Optics: Europa for Presbyopia	Center near	Custom	+1.00 to +3.50D	16.0-20.0 mm	Custom
Wave: Multifocal	Center near and center distance	+30.00 to -30.00D	Up to +5.00D	12.5-18.0mm	Custom
X-Cel Specialty Contacts: Atlantis Multifocal	Center distance	+20.00 to -20.00D	+0.75 to +4.00D	15.0 to 17.5mm	6.5 to 9.12mm




Oasis TEARS
Oasis TEARS PLUS
Oasis TEARS®
Oasis TEARS MULTIDOSE®
Oasis TEARS PLUS®


CLEAR CARE PLUS
HydraGlyde
CLEAR CARE PLUS
HydraGlyde


NEW
OPTI-FREE
pure moist
MULTI-PURPOSE DISINFECTING SOLUTION
Comfort & Moisture
REMOVES PROTEIN DEPOSITS AND REDUCES LIPID DEPOSITION FOR SILICONE HYDROGEL AND SOFT CONTACT LENSES
CLEANS • RECONDITIONS • RINSES • DISINFECTS • STORES
STERILE
10 FL OZ (300 mL)
Alcon
OPTI-FREE
pure moist
Comfort & Moisture
MULTI-PURPOSE DISINFECTING SOLUTION
CLEANS • RECONDITIONS • RINSES • DISINFECTS • STORES
STERILE
10 FL OZ (300 mL)
Alcon


NEW!
BAUSCH + LOMB
peroxi clear
3% Hydrogen Peroxide
Excellent All Day Comfort


Bausch+Lomb Soothe
Long Lasting
Soothe XP
Extra Protection
Systane
Systane ULTRA
optive
THERA TEARS
Lubricant Eye Drops
GenTeal
Preservative Free in the Eye
blink


Bausch+Lomb
Boston
Multi-Action Solution
SIMPLUS


For Gas Perm Lenses
Menicon
Unique pH
MULTI-PURPOSE SOLUTION
Unique pH


BAUSCH + LOMB
Bio true
B+L

Clear care

- Berntsen DA, Hickson-Curran SB, Jones LW, et al.
- Optom Vis Sci. _2016 Aug;93(8):809-19. **Subjective Comfort and Physiology with Modern Contact Lens Care Products.**
- Compared 3 MPS solutions to peroxide-based system with 3 different soft contact lens materials.
- Compared subjective comfort and ocular physiology
- Habitual soft contact lens wearers (n = 236) - 3 sites
- Washout period ≥4 days (no contact lens solution)
- New lens worn 10-14 days (washout period (≥4 days) between each solution)

- Compared levels of comfort between MPS compared to peroxide disinfection.
- ★ 6 MPS/material combinations – no change in corneal staining vs. peroxide
- ★ 3 MPS/material combinations – increased corneal staining of up to 0.57 units versus peroxide solution.

Peroxiclear

- Schafer, J, Steffen R, Rah MJ
- Clin Ophthalmol 2014 Oct 6;8:2035-40. doi: 10.2147/OPTH.S69701. eCollection 2014.
- **Patient satisfaction with a novel one-step hydrogen peroxide solution.**

- Evaluated product performance of a hydrogen peroxide cleaning and disinfecting solution
- Used by habitual Clear Care users
- 2 week study – evaluated at screening and 2 week follow up visit
- 297 subjects
- 21 sites by 21 investigators in the US
- Test solution was better overall (85.9%) than habitual contact lens solution (14.1%) (P<0.001).
- ★ Significantly higher for
  - Comfort (85.4% vs 14.6%)
  - Moistness (90.0% vs 10.0%)
  - Cleanness (91.6% vs 8.4%)
  - Clarity of vision (85.8% vs 14.2%)

Management strategies

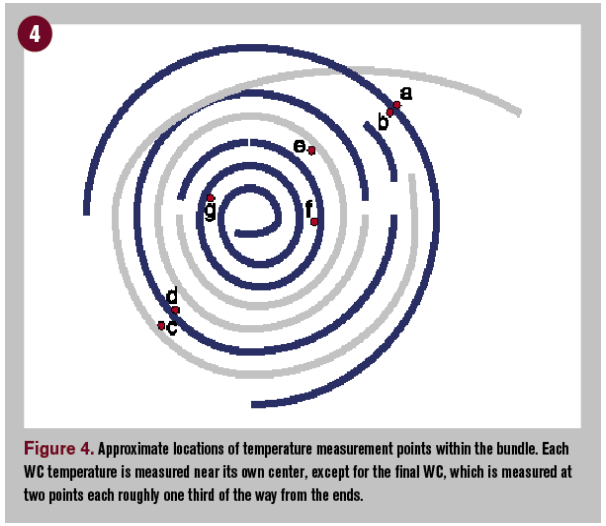


Figure 4. Approximate locations of temperature measurement points within the bundle. Each WC temperature is measured near its own center, except for the final WC, which is measured at two points each roughly one third of the way from the ends.

Optom Vis Sci. 2015 Sep;92(9):e327-33. All Warm Compresses Are Not Equally Efficacious. Murakami DK1, Blackie CA, Korb DR.

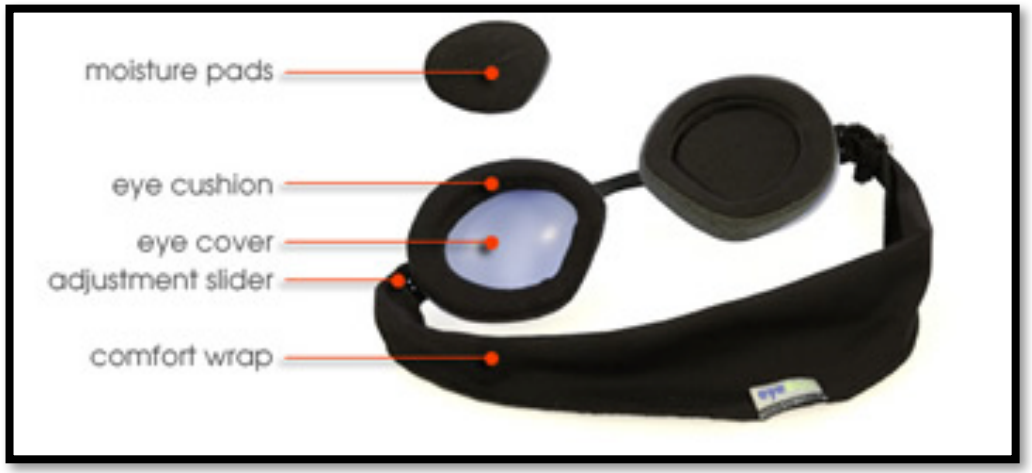

Xiidra
(lifitegrast
ophthalmic solution) 5%
For Topical Application to the Eye
Shire


Allergan
NDC 0023-5301-05
Restasis
MultiDose
(Cyclosporine Ophthalmic Emulsion) 0.05%
For Topical Application in the Eye
PRIOR TO FIRST USE, PLEASE READ BOTTLE PREPARATION INSTRUCTIONS
Sterile, Preservative-Free
5.5 mL
Rx only


Restasis


truetear
truetear


eyeeco


moisture pads
eye cushion
eye cover
adjustment slider
comfort wrap


OCuSOFT
LID SCRUB Original
OCuSOFT
SCRUB Original
OCuSOFT
LID SCRUB PLUS
30


OCuSOFT
HypoChlor
Hypochlorous Acid Solution 0.02%
For Eyelids
& Eyelashes
Non-Toxic| Non-Irritating| All Natural
NET WT. 2 FL OZ. (59 ML)
OCuSOFT
HypoChlor
Hypochlorous Acid Gel 0.02% GEL
For Eyelids
& Eyelashes
Non-Toxic| Non-Irritating| All Natural
NET WT. 2 FL OZ. (59 ML)


Rx Only
Avenova
Neutrox
SPRAY SOLUTION
Daily Lid & Lash Hygiene
Gentle and soothing for everyday use
Non-sensitizing and non-irritating to skin


E9
ESSENTIAL NINE
Eyelid and Skin


tranquileyes waters


tranquileyes
Tea Tree Foaming Facial Cleanser
with Chamomile and Shea Butter
TeaTree
CLEANSER
TeaTree
CLEANSER

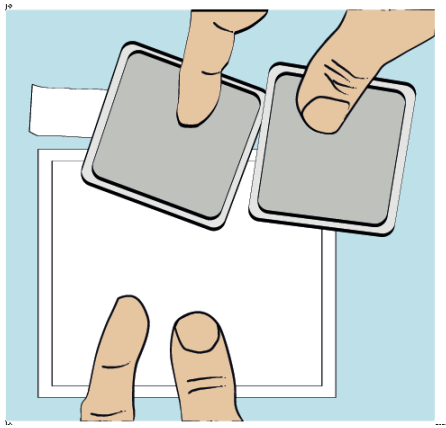
Warm Compress Devices

MiBo Thermoflo

Heated Eye Pad by Digital Heat Corp.

Lipiflow

Eyegiene



New wearer experience

Poor technique leads to problems with CL application

Attempting to lift eyebrow rather than pulling upper lid open

Blinking just as lens approaches – lens falls off finger or gets stuck to bottom lid/lashes

How do patients feel during trial and application & removal training?

Learn how to wear contact lenses	Prepare your hands for lens insertion	Prepare your eyes for lens insertion	Open the new lens container	Retrieve the lens from the lens container
Prepare the lens for insertion	Position the lens for insertion	Secure your eye to accept the lens	Approach your eye with the lens	Seat the lens on your eye
Secure the lens on your eye	Keep the lenses secure on your eye	Keep your eyes from getting irritated	Secure your eye to remove the lens	Approach your eye to remove the lens
Remove each lens	Clean each lens	Store each lens	Dispose of lenses	

Possibly overwhelmed?

 # steps to apply and remove CL:

19

JJV Data on file 2014. Training Wheels Research N=1,200 Quantitative interviews in China, Japan, RU and US with considerers, trialists & drop-outs

Handling, Wear & Care training

Clean, comfortable, private teaching area

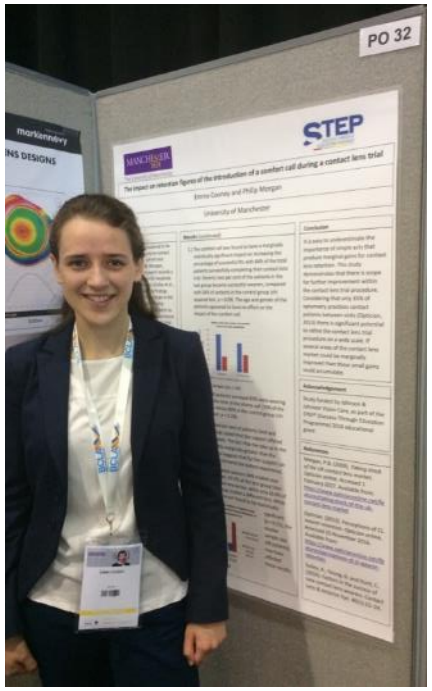
Break process down into small steps

Positively encourage at each stage

Speak slowly and softly, actively listen

Build trust and confidence

Early Intervention – Follow-up / Progress Call



Prospective study, 100 **neophytes**

50 received **follow-up call** (Test Group)

50 did **not** receive a call (Control Group)

	Test	Control
% who became successful wearers	**72**	56
% of unsuccessful fits who returned to trial other CLs	**44**	21

Cooney E & Morgan P. The impact on retention figures of the introduction of a comfort call during a contact lens trial. Poster, BCLA Conference, June 2017.

MANCHESTER 1824

How to make a difference: new wearers

Recommend optimum lens first time to meet both vision and lifestyle needs.
Offer alternatives where needed

Provide comprehensive novice support: take home information, video links, apps and **progress call**

Encourage habit formation: regular wear, regular purchase and convenient regular supply along with **regular follow up**

Conclusion

When an individual w/dry eye disease (DED) presents for contact lens evaluation…..

- The temptation may be to proceed, hoping that the patient will “adapt,” or “get better”
- Don’t do it!!
- Prepare the dry eye prior to CL wear; it can improve long-term better outcomes.

- You will be the hero!