

The Science of Compliance

New research uncovers patient attitudes and behaviour
towards contact lens compliance

A GUIDE FOR EYE CARE PROFESSIONALS



How can I make
my patients
more compliant?



I wonder what his
contact lens regimen
really consists of?

FOREWORD

As contact lens practitioners, we know from both our clinical experience and from published epidemiological papers about the importance of contact lens compliance. A number of surveys have shown a link between inadequate contact lens care and ocular infection. At the same time, we know that many of our patients are not fully compliant with the instructions they receive about lens wear and care, but it has not been immediately clear where the major deficiencies lie. However, we now have some clear answers.

This guide provides new, independent research from seven European countries and 1,400 contact lens wearers. Here, we have valuable evidence illustrating the prominent areas of contact lens non-compliance and patient attitudes towards lens wear and care.

This guide highlights where we can do better with our contact lens wearers. The key recommendations address shortcomings in consumer behaviour and attitudes towards contact lens compliance. If we, as contact lens practitioners, can understand both the real life behaviour of our patients and the perceptions they have about caring for their contact lenses, we can communicate better with them, and optimise their use of both contact lenses and care systems.

To help you evaluate patient compliance levels, we have devised a traffic light model, rating consumer behaviour against fourteen key measures of lens wear and care which we have identified. These measures will be familiar to all clinicians working in the modern contact lens practice and include: not sleeping in lenses when not advised to, washing hands before inserting and removing lenses and cleaning the lens case with solution after each use.

Finally, this guide highlights educational and support materials for both patients and your colleagues in your practice. These materials aim to help patients with clear recommendations for contact lens care and support you in your role in understanding the problem areas which need more focused education.

I hope this guide is a useful addition to your clinical contact lens practice.

**Dr Philip B. Morgan, PhD MCOptom FAAO FBCLA
Eurolens Research, The University of Manchester**

EXECUTIVE SUMMARY

RESEARCH AND GUIDE RATIONALE: The primary aim of the research reported in this guide is to provide statistically reliable evidence as to whether or not contact lens wearers comply with recommended lens usage, storing and cleaning regimens and protocols, and if not, to identify areas where failures are occurring. This knowledge helps to re-evaluate basic Eyegiene™ Programme principles with a view to equipping eye care professionals with the tools they need to address the unmet need for contact lens wearer education. This guide aims to share key findings which help identify problematic areas in contact lens compliance; these areas can be targeted when contact lens wearers visit a practice in order to better educate them and enhance their lens wearing experience.

EYEGIENE™ PROGRAMME: This guide introduces Bausch & Lomb's compliance programme relating to contact lens wear and care.

METHODOLOGY: The research findings have been reviewed in Dr Philip Morgan's White Paper '*Wearer compliance with contemporary contact lenses*'.¹ Data for this research was derived from two independent studies conducted on behalf of Bausch & Lomb's Europe, Middle East and Africa division.² The first study was an Internet panel-based survey of 2,369 contact lens wearers across seven European countries (UK, Germany, France, Italy, Spain, The Netherlands and Sweden). This study is used to provide a view on the compliance levels of daily disposable contact lens wearers. The second survey reported on 1,402 wearers of two-weekly or monthly-replaced lenses aged 16-64 years across seven European countries (UK, Germany, France, Italy, Spain, Russia and Poland). This was a far-reaching internet survey of contact lens use and covered areas such as the duration and frequency of contact lens wear, methods of lens cleaning and disinfecting, the lens case and lens storage and the communication between lens wearer and eye care professional.

To really appreciate behaviours and attitudes relating to contact lens compliance, we need to understand the whole story of patient compliance in lens care. For this reason, the research results reported focus on two-weekly and monthly lenses which were most appropriate.

RESULTS OVERVIEW

THE PRACTICE OF NON-COMPLIANCE

- Over-wear of contact lenses is common practice across the board. Only one in four respondents (23%) claim to never wear their lenses beyond the recommended period. ²
- The users of lenses with a two-weekly changing interval are more likely to over-wear their lenses than those with monthly lenses, as are younger contact lens wearers compared to older ones. ¹
- Typical non-compliance issues relating to insertion and removal of lenses include not always washing hands, and not following the recommended care regimen. ²
- 17% of contact lens wearers always wear their lenses for more days than they should. ²
- Over one third (35%) of contact lens wearers with lenses not intended for overnight wear do sometimes sleep with their lenses in. ²
- 20% of those with extended wear lenses exceeded the recommended overnight frequency. ²

BRIDGING THE KNOWLEDGE GAP

- Of those surveyed, 88% received information from their eye care professional with regard to caring for lenses, and of those that did, 23% claimed they did not recall seeing any information highlighting the complications and risks associated with contact lens wear. ²
- 93% of contact lens wearers believe that not following the recommended lens care regimen does increase the risk of contracting an eye infection. ²
- 46% of all respondents had been given lens care information in the last 12 months. ²

IDENTIFYING AN UNMET NEED

- The findings demonstrate that 98% of all contact lens wearers are not fully compliant when it comes to executing the correct care regimen at insertion and removal of contact lenses. ²

THE SCIENCE OF COMPLIANCE

Webster's Medical Dictionary defines compliance as the process of complying with a regimen of treatment.³

In the context of contact lens wear, this can be interpreted as a wearer correctly adhering to the instructions provided by the contact lens professional with respect to optimum lens wear and care.

Consumers are not inherently non-compliant. The majority, however, slip-up occasionally and need help to become more compliant. In order to achieve full compliance, many of them will look for guidance from their eye care professionals. By working together with the patient in partnership, both professionals and patients can benefit from the progression from non-compliance to more compliant behaviour.

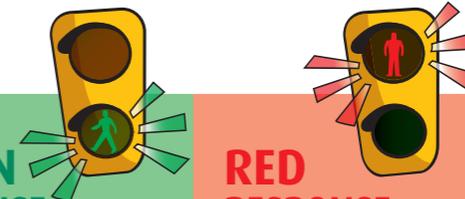


NEW TRAFFIC LIGHT COMPLIANCE MODEL

The level of compliance amongst contact lens wearers is not always easily measurable. A colour-coded traffic light model, developed by Dr Philip Morgan, presents a new method for reviewing the level of contact lens compliance. The model provides a visual measure of the levels of non-compliance, placing contact lens wearers' behaviours into categories: **green behaviour** – a response considered to be wholly compliant with manufacturer guidelines and best practice contact lens clinical practice and **red behaviour** a response considered to be non-compliant.

Bausch & Lomb endorses green behaviour only and will endeavour to work with eye care professionals and practice front-line staff to move patients from 'red' (non-compliant behaviour) to 'green' (compliant behaviour).

Traffic Light Compliance Model



QUESTION	GREEN RESPONSE	RED RESPONSE
How many days do you wear your lenses before throwing them out?	As recommended for lens type	More than 10% extra
How often do you sleep in your lenses?	As advised by practitioner or less	More than advised
Do you nap in your lenses?	Never napping in lenses	Some napping in lenses
Do you wash your hands before inserting and removing and what with?	Always wash hands with soap, antiseptic liquid or wipes	Not always washing hands
What do you use to clean/store your contact lenses?	Multipurpose / Hydrogen Peroxide (& cleanser and/or Saline)	Saline only / any water or saliva / cleanser - protein only
Where do you store your contact lenses?	In a lens case	In a mug / glass
Do you replace your solution or top up?	Always replacing all solution in the lens case	At least sometimes topping up
Do you cover your contact lens completely?	Always	Less frequently
Do you close your lens case tightly?	Always	Less frequently
Do you clean your case?	Everyday with solution	Without solution or less often than once a week
How often do you change your case?	Monthly	Anything worse
Do you close the cap of your bottle tightly?	Yes - always	Anything worse
Do you ever check the expiry date of your solution bottle?	Yes - regularly	Less frequently
Do you ever share your contact lens case with other people?	Never	At least sometimes

This model helps take patients through the key compliance questions and identifies areas of non-compliance.

KEY FINDINGS

WEARING SCHEDULES

How many days do you wear your lenses before throwing them out?

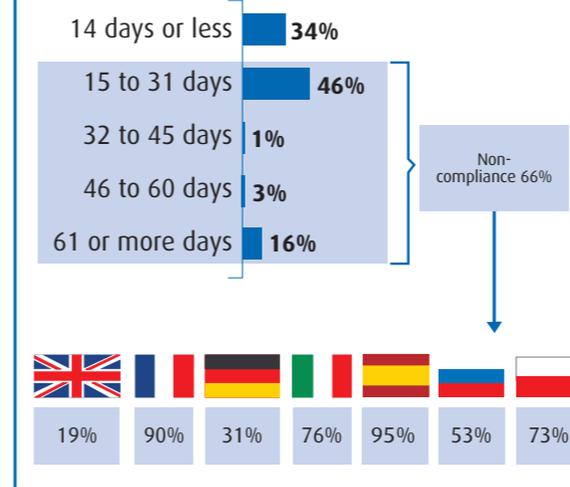
KEY FINDINGS

- The average wearing period is typically four days more than the recommended period
- 17% always wear their contact lenses for more days than they should
- Only one in four (23%) would never wear their lenses beyond the recommended period

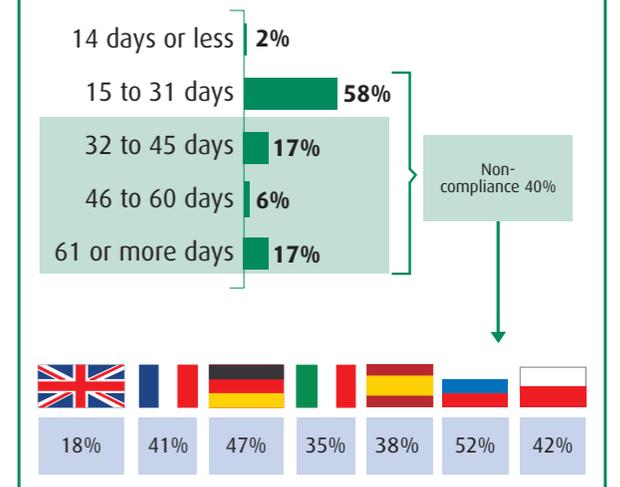
INSIGHT

Behaviour towards discarding lenses at recommended time differs dramatically between countries, while young wearers are less likely to discard their lenses on time. Users with a two-weekly changing interval are more likely to over-wear their lenses than those using a monthly modality. Despite those specifics, there is an inherent temptation for contact lens wearers to extend the life of their lenses, even if just by a day.

Two-weekly soft lenses

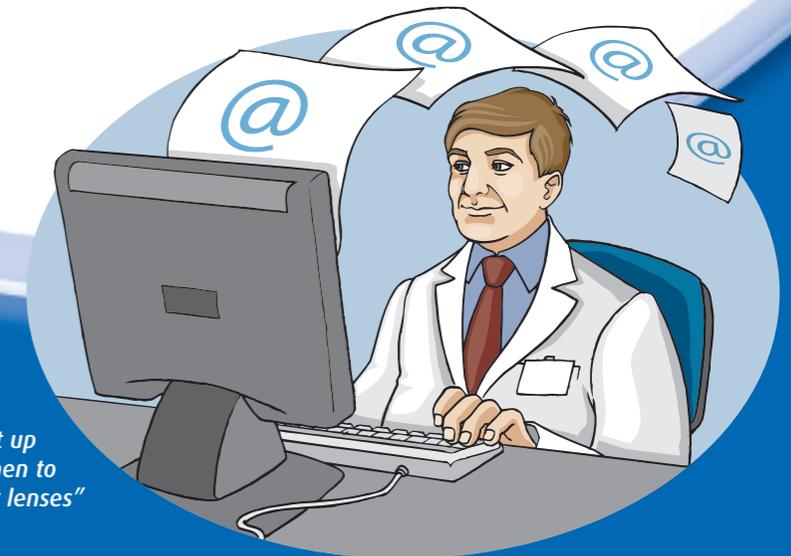


Monthly soft lenses



EYEGIENE™ PROGRAMME RECOMMENDATION

It is always recommended that patients replace their lenses as per the wearer schedule as advised by their eye care professional. When a patient wears a contact lens, tears coat it with oils and proteins. Even over just a short time, microscopic deposits are formed on the lens surface, which degrade comfort and vision. The correct procedure for cleaning and disinfecting all reusable lenses helps to keep them more comfortable and clearer for vision whilst also reducing the potential for infection.



"It might be useful to set this patient up with an email reminder of when to change their lenses"

SLEEPING IN LENSES

How often do you sleep in your lenses?

Do you nap in your lenses?

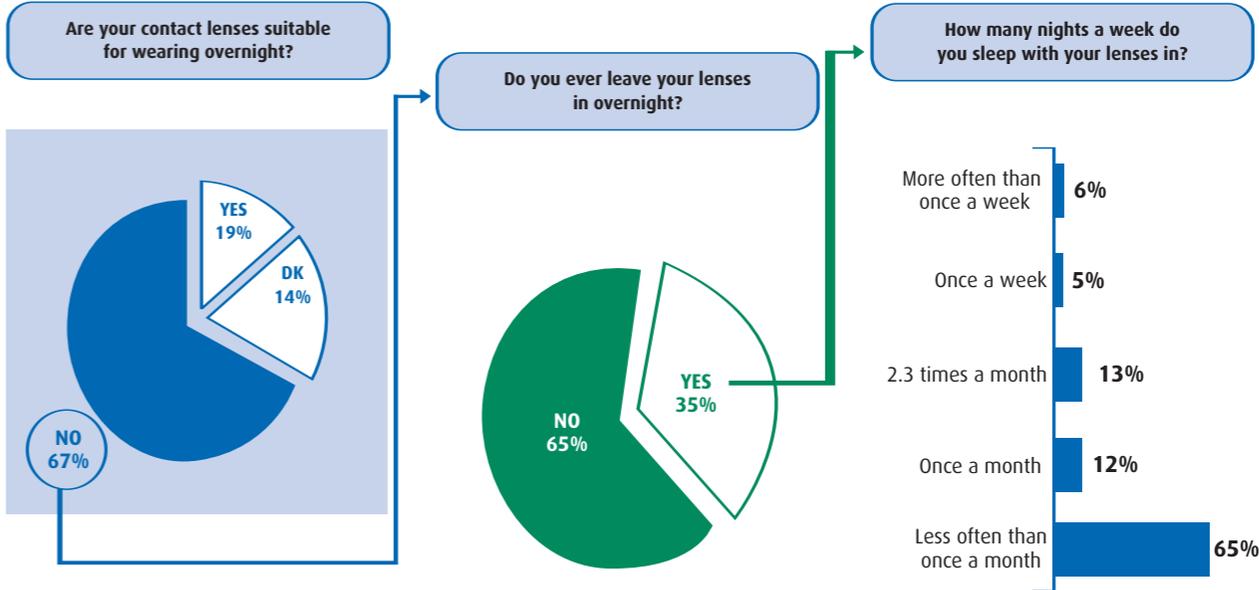
KEY FINDINGS

- 35% of contact lens wearers with lenses not intended for overnight wear sometimes sleep with their lenses in
- 68% of contact lens wearers nap during the day wearing lenses not suitable for this purpose

INSIGHT

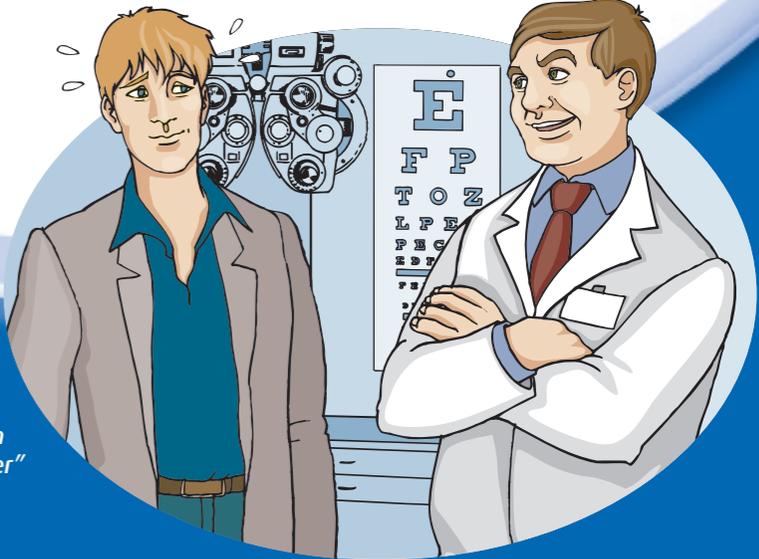
This form of non-compliant behaviour is significant. It is known that sleeping in lenses that are not designed for overnight wear places the wearer at about eight times the risk of suffering a contact lens associated keratitis.⁴

SLEEPING WITH LENSES ON - NON EXTENDED WEAR LENSES



EYEGIENE™ PROGRAMME RECOMMENDATION

It is important to assess lifestyle habits of the wearer before recommending a suitable lens type. Contact lens wearers should be made aware and reminded regularly of the reasons for not sleeping in lenses which are unsuitable for overnight wear. Where there is suspicion that a wearer may want to sleep in lenses, extended wear materials are likely to be more suitable. Any contact lens fitted must meet the everyday demands of the wearers and the eye care professional will be best placed to determine which lenses are best suited to the lens wearer's lifestyle.



"I wish that he would admit that he has been sleeping in his lenses so we can discuss the implications together"

HANDS UP FOR EYEGIENE

Do you wash your hands before inserting and removing, and what with?

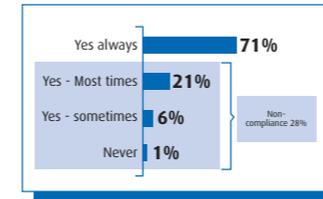
KEY FINDINGS

- 28% of contact lens wearers do NOT wash their hands before inserting their lenses
- 43% of contact lens wearers do NOT wash their hands prior to removing them
- Of those who wash their hands, 77% used soap prior to insertion of lenses and 76% prior to removal of lenses

INSIGHT

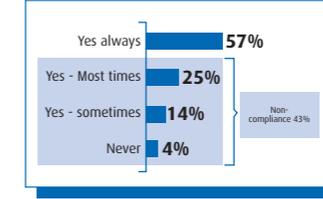
Consumers are more likely to wash their hands before inserting their lenses rather than on removing lenses, but should be encouraged to wash their hands before touching their eyes on any occasion. Of those washing their hands, although the majority of them are using soap, there is still a significant proportion that is not. Evidence from the use of hand washes in hospitals confirms that an element of training in the best methods of hand washing is required in that setting,⁵ and it would seem reasonable to assume that this could be helpful to contact lens wearers.

HANDWASHING REGIMEN BEFORE INSERTING LENSES



	UK	FR	DE	IT	ES	PL	RU
Always	56%	70%	66%	71%	77%	78%	79%
Most times	27%	24%	28%	23%	16%	18%	17%
Sometimes	15%	4%	5%	6%	6%	4%	3%
Never	3%	3%	2%	1%	2%	1%	0%

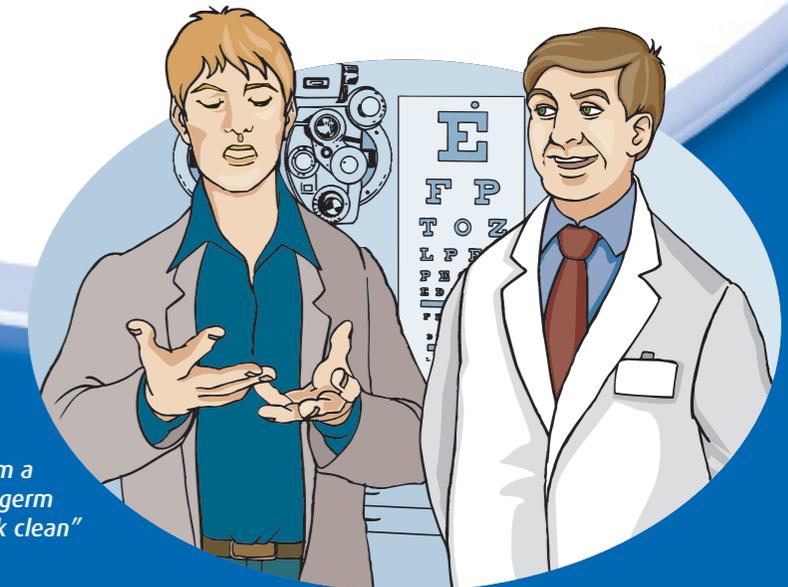
HANDWASHING REGIMEN BEFORE REMOVING LENSES



	UK	FR	DE	IT	ES	PL	RU
Always	41%	54%	53%	56%	60%	71%	68%
Most times	25%	30%	27%	28%	23%	22%	23%
Sometimes	26%	12%	17%	13%	15%	7%	7%
Never	9%	5%	4%	4%	3%	2%	1%

EYEGIENE™ PROGRAMME RECOMMENDATION

Infections are most commonly suffered when micro-organisms are transmitted through direct contact from person-to-person and indirectly via contaminated hands or surfaces.⁶ It is important to wash hands prior to the insertion and removal of lenses to minimise the risk of infection. Hands should be washed with soap, antiseptic liquids or wipes and dried with a lint-free towel prior to insertion and removal.



"In an ideal world it would be helpful if we could perform a swab test on this man's hands to show him how germ ridden they really are even though they look clean"

FINDING THE RIGHT SOLUTION

What do you use to clean/store your contact lenses?

Where do you store your contact lenses?

Do you replace your solution or top-up?

Do you cover your contact lens completely?

KEY FINDINGS

- 14% admit having used either water or mouth saliva to clean lenses at some point
- When it comes to filling the case with contact lens solution, almost a third (30%) exhibit non-compliant behaviour by topping-up existing solution at least sometimes
- 25% of all contact lens users do not always change the solution in the lens case if there is an extended interval between wear
- 2% of people admit to storing their lenses in a glass or mug
- Total storing related non-compliance (using a case, using sufficient fresh solution, soaking time and re-soaking as required) is exhibited by 49% of respondents

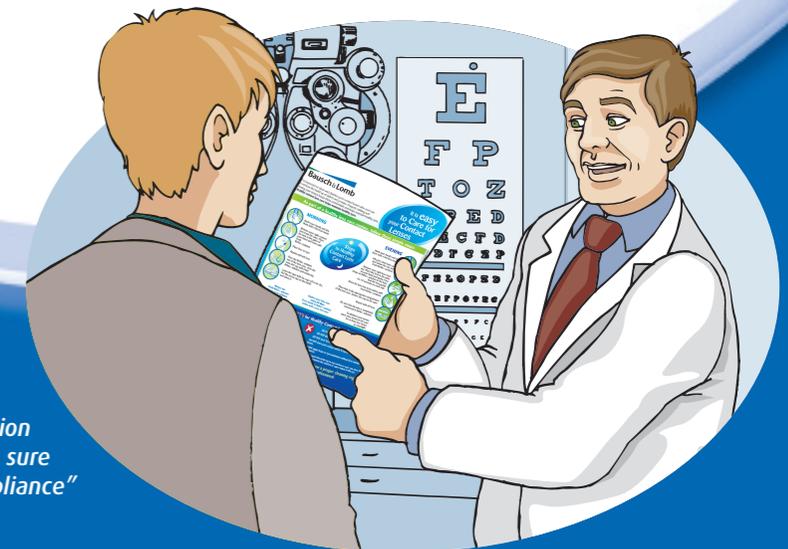
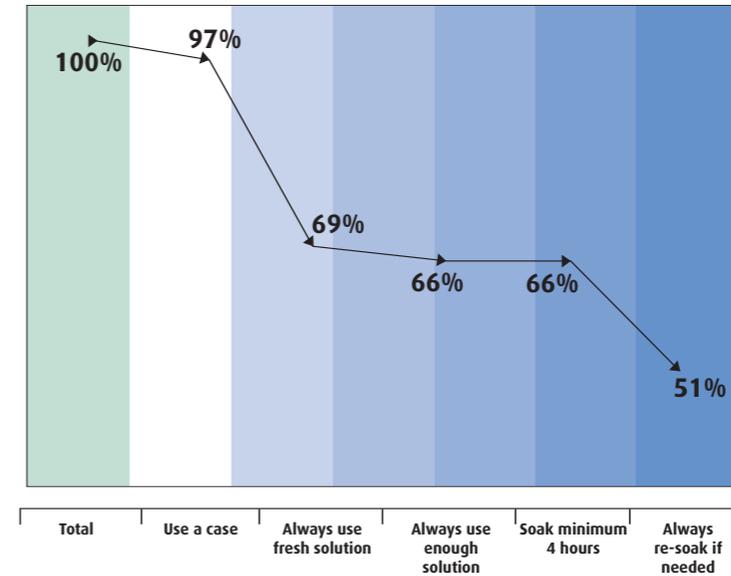
EYEGIENE™ PROGRAMME RECOMMENDATION

Wearers need to be made aware of the consequences of using storage solutions incorrectly and how this is directly linked to an increased risk of infection as shown in epidemiological studies. ⁷ Eyegiene™ is therefore a key message to send out to new and familiar contact lens wearers. There is a wide range of products for contact lens care and professionals prescribe solutions based on several factors such as ease of use, compatibility with the contact lens material, individual patient sensitivities, allergies and wearing patterns.

INSIGHT

When we consider levels of compliance for storing and disinfecting contact lenses, an area of grave concern is the topping-up of solution in the lens case to “stretch out” the use of solution. The replacement of the solution in the lens case prior to the storage of lenses is not an automatic consideration for lens wearers.

STORING COMPLIANCE - SUMMARY



"I think it would be useful for me to run through the disinfection and storage checklist with this patient just to make sure there are no areas of non-compliance"

THE VERDICT ON THE CASE

Do you close your lens case tightly? Do you clean your case?
How often do you change your case? Do you share your
contact lens case with other people?

KEY FINDINGS

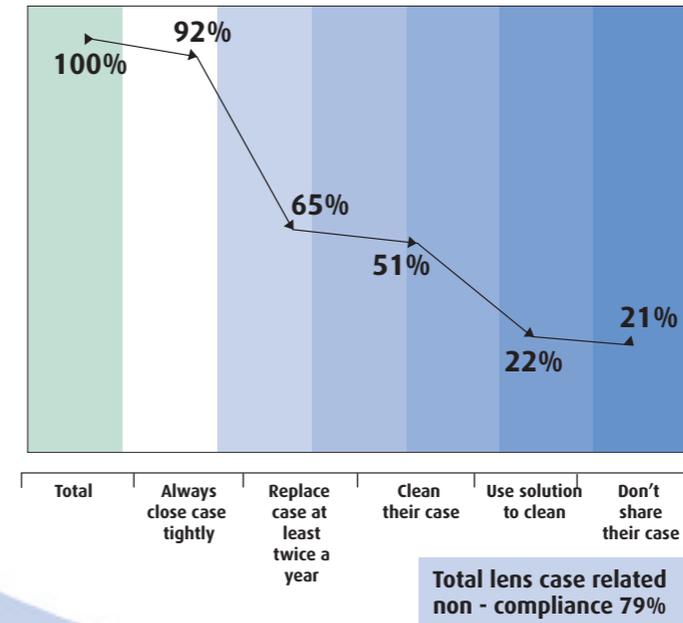
- 20% of wearers indicated that they did not clean their lens case
- 66% of wearers exhibited non-compliant behaviour by either using water (30%), water and soap (22%), antiseptic liquid (9%) or other (5%) to clean their lens cases
- Of those that did clean their lens case, only 58% did this on at least a weekly basis
- Only a third of wearers (34%) cleaned their cases with contact lens solution
- About 20% of wearers replaced their lens case annually or less frequently when the recommendation is a month
- Sharing of lens cases was practised by 5% of contact lens wearers
- Only 10% of wearers adopted ideal practice and used a new case every month or more frequently

INSIGHT

An important outcome of this research is that case care is often overlooked by lens wearers which can ultimately result in an increase of the bioburden at the ocular surface during contact lens wear.⁷ Furthermore, the development of microbial biofilms in contact lens cases can reduce the effect of a disinfecting solution.⁸

We still need to reinforce the importance of cleaning cases on a daily basis. Those that do clean them have very varied cleaning schedules with almost a fifth (17%) cleaning them daily and just over a fifth (21%) only doing so on a monthly basis.

LENS CASE COMPLIANCE - SUMMARY



EYEGIENE™ PROGRAMME RECOMMENDATION

Appropriate disposal and care of contact lens cases is an important part of the overall care process. Lens cases should never be shared, should always be cleaned daily with the appropriate solution and left to air dry. The case should be changed at least once on a monthly basis.



ABOUT THE BOTTLE

Do you close the cap of your bottle tightly?

Do you ever check the expiry date of your solution?

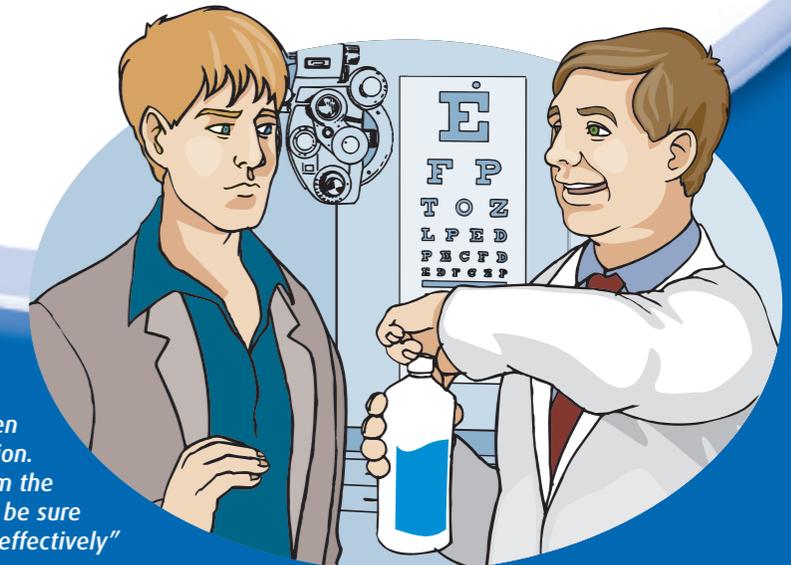
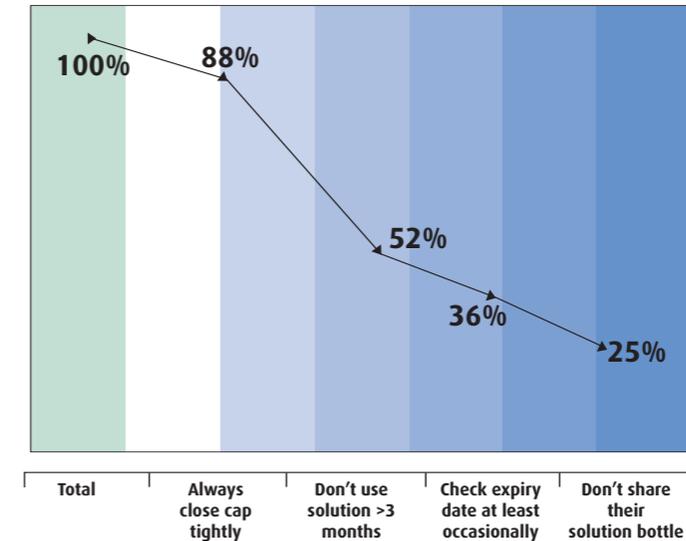
KEY FINDINGS

- 29% of lens wearers admit to using their solution for a period of more than four months or more before throwing the bottle away
- 35% claim to regularly check the expiry date on their solution bottle
- 11% of respondents do not always close their contact lens solution bottle tightly after opening it

INSIGHT

There was considerable variation in the frequency of throwing away a bottle of solution. About a quarter of wearers reported that they kept their solution for a year or more after opening although a majority (58%) discarded their solution no more than three months after opening it. On average, respondents considered that the expiry of a contact lens solution was 17 months after opening it.

SOLUTION BOTTLE COMPLIANCE - SUMMARY



EYEGIENE™ PROGRAMME RECOMMENDATION

The expiry date on the bottle should be checked prior to its purchase, and contact lens wearers should be encouraged to get into this habit. Once opened, the solution should not be used beyond the three month recommended period, even if the expiry date has not expired.

"This lens wearer has a tendency to be non-compliant when it comes to how they are using their contact lens solution. He should be encouraged to buy his solution from the front-line staff in the practice. This way we can be sure to remind him of how to use it effectively"

LENS CARE PORTFOLIO

Bausch & Lomb has been the leading manufacturer of eye care products for over 150 years. The company's product portfolio includes some of the best known and respected brands available in more than 100 countries.

ReNu® Multi-Purpose Solution



The original multi-purpose solution that cleans, rinses, disinfects, stores and lubricates all soft contact lenses.

ReNu® Multi-Purpose Solution combines the convenience and simplicity your patients want with the efficacy and safety they need.

ReNu® Multi-Purpose Solution effectively kills germs in just 4 hours – so it helps keep contact lenses comfortable and eyes healthy.

Key Features & Benefits

- Provides outstanding disinfection⁹ plus safe lens storage for up to 28 days. Ideal for in-practice use.
 - Contains Dymed™, providing excellent disinfecting efficacy and effectively kills micro-organisms on the lens.
 - Contains Poloxamine, removing lipids and environmental debris, while enhancing wettability.
 - One bottle solution for all day lens care requirements.

EYEGIENE™ PROGRAMME RECOMMENDATION

Bausch & Lomb has created patient tear sheets that are aligned to the traffic light model questions for you to provide to contact lens wearers. Key recommendations are as follows:

Bausch & Lomb

It is important to clean and disinfect your contact lenses after each use to remove the build-up of debris and protein. Properly rubbing and rinsing your lenses keeps them comfortable and helps maintain healthy eyes. **Healthy contact lens care helps maintain healthy eyes.**

It is easy to Care for your Contact Lenses

As part of a healthy lens care routine, follow these simple steps:

MORNING

Wash your hands and dry them with a lint-free towel.

Remove your right contact lens from the case. Place the lens in the palm of your hand and rinse with fresh ReNu® solution.

Place lens on eye.

Repeat with left lens.

Pour the ReNu® solution out of the lens case, rinse the case and cap with fresh ReNu® solution and shake dry.

Leave the case with the caps off to air dry. Put the screw cap on the bottle and close it.

Always use fresh ReNu® solution. Never re-use solution.

EVENING

Wash your hands and dry them with a lint-free towel.

Fill your clean lens case just below the rim with fresh ReNu® solution.

Remove your right lens from eye. Place the lens in the palm of your hand and apply a few drops of ReNu® solution to the lens. Rub the lens gently for 10 seconds on each side.

Rinse the lens free from debris with fresh ReNu® solution.

Place lens in the appropriate compartment of the lens case. Secure the cap on the case.

Repeat with left lens.

Be sure that the lens is completely immersed in ReNu® solution.

To disinfect your lenses, store your lenses in the case for at least four hours, or overnight.

Steps to Healthy Contact Lens Care

Replace your lens case every 30 days. Every bottle of ReNu® solution comes with a new lens case.

DO'S & DON'TS for Healthy Contact Lens Care

DO wash your hands every time before handling your lenses.

DO use fresh solution to store your lenses each day.

DO replace your lens case every 30 days.

DO ensure solution bottle is closed after use.

DO contact your practitioner immediately if your eyes become very red, sensitive to light or uncomfortable.

DO NOT use tap water to wash your lenses or lens case.

DO NOT dilute or re-use solution in the case.

DO NOT wear lenses if your eyes are red or uncomfortable.

DO NOT store your contact lenses in saline. It will not disinfect your lenses.

DO NOT apply drops or eye medication without first consulting your practitioner.

DO NOT touch the bottle tip to any surface or your eye since this may contaminate the solution or cause injury to the eye.

For healthy contact lens care, it is important to follow a proper cleaning regimen and to regularly visit your eye care professional.

CONCLUSION

The level of compliance amongst contact lens wearers is not always easily measurable so this research into real life behaviour is valuable in helping us pinpoint the key areas of non-compliance. Understanding the problem areas gives us an opportunity to address each of them in turn, throughout the fitting and aftercare process, by putting in place a regimen that takes into account the consumers' lens wearing schedules, lifestyle habits and every day demands of our contact lens wearers.

Ultimately every eye care professional wants a confident partnership with their patients in order to establish mutual understanding and goodwill that will result in optimum ocular health. Simple visual aids such as the new traffic light model for reviewing the level of contact lens compliance can be shared with patients to help identify areas of non-compliance, ultimately moving them from clinically undesirable behaviour towards full compliance. Eye care assistants and front-line staff can also play a vital role in using these tools during fitting sessions.

As in many areas of health and well-being, consumers generally recognise that they should be following the advice that they are given, but common sense does not always translate into common practice. By understanding these insights we can further support and encourage contact lens wearers to be as compliant as possible with all aspects of lens wear and care.

Dr Philip B. Morgan, PhD MCOptom FAAO FBCLA
EuroLens Research, The University of Manchester

EYEGIENE™ SUPPORT MATERIALS

Bausch & Lomb is supporting the profession, helping educate patients about compliance with a set of tools for the practice:

PATIENT RECOMMENDED CONTACT LENS REGIMEN TEAR SHEETS - straightforward steps to contact lens wear and care success.

'Talking to your patient' leaflet: Bausch & Lomb can provide the practice with patient tear sheets describing best practice for healthy contact lens care. This sheet is intended for patients and professionals to talk through the recommended regimen and for patients to take away as a reference.

POSTERS FOR THE PRACTICE - the compliance key measures for planned replacement, extended wear lenses as an easy reference tool for ECPs.

Practice Poster: New poster available highlighting the traffic light model measures. The list of key questions will help you run through the key check list with patients during check-ups giving them the red or green approval.



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