



Encourage compliance not complacency

Karen Walsh & Jane Veys

Karen Walsh and Jane Veys outline some simple steps to ensure that all contact lens wearers, including daily disposable users, maximise comfortable and healthy lens wear.

Compliance with instructions is a key issue for the eye care professional, the contact lens industry and, not least, the contact lens wearer. In this article we will first look at the latest research findings on the extent of non-compliance in contact lens wear, and the patient behaviour that poses the greatest risk of infection. We will look at compliance in general health care and how this relates to compliance with contact lenses. We will examine whether it is possible to identify those contact lens wearers susceptible to poor compliance and, most importantly, suggest some practical ways in which compliance among these patients can be enhanced. Finally, we will review the literature in relation to the use of daily disposable contact lenses and provide some specific tips to promote compliance with this regime.

Recent compliance and infection studies

Compliance in contact lens wear has received frequent attention in the literature. Two comprehensive review articles summarised the wealth of studies into rates of non-compliance and its consequences for ocular health.^{1,2} More recently there have been renewed attempts to investigate in detail how contact lens wearers care for their lenses and relate non-compliant behaviours to known risk factors for contact lens-associated ocular infection.

Morgan³ reported on two large-scale pan-European consumer surveys and found that only 0.3% of daily wear contact lens users were fully compliant with all of 14 key compliance measures. He showed that basic aspects of lens care, such

as using solution, storing in a lens case and closing the case tightly, were correctly performed by more than 80% of wearers. However, other areas - too many days of wear, overnight use of lenses prescribed for daily wear, incorrect hand-washing and topping up solutions - had only moderate levels of compliance (40-80%). Napping with lenses, case replacement and case cleaning, and checking expiry dates were associated with high levels of non-compliance (less than 40% compliant).

Some non-compliant behaviours for all types of contact lens wear are listed in *Table 1*. While all of these behaviours are in some way modifiable, it is perhaps unrealistic to be able to educate the wearer in all of these areas all of the time. This being the case, how can the practitioner prioritise? Morgan has linked compliance factors with a corresponding relative risk of infection, as shown by various studies, in order to highlight the areas of lens care to which practitioners should give special attention. He suggests that discussion at aftercare visits should focus on four specific areas: case care, rubbing and rinsing lenses, overnight wear and use of the correct solution.

Stapleton et al⁴ have looked at risk factors for contact lens-related microbial keratitis (MK) in Australia and found these included overnight use, poor case hygiene, smoking, internet purchase, less than 6 months' wear experience and higher socio-economic group. A conclusion of this and the companion study of Dart et al⁵ was the importance of compliance to the prescribed regime. Dart concludes that to maximise safety in contact lens wear, practitioners should ensure their patients wear their lenses according to the recommended wearing schedule, are properly instructed in lens handling, lens case hygiene and replacement, and are aware of the importance of good hand hygiene and the increased risk associated with overnight use.

Table 1: Some potential non-compliant behaviours for all contact lens types, with those eliminated by daily disposable lens use shown in bold

General hygiene and handling	Lens wear	Lens care
Failing to wash and dry hands before lens handling	Overnight lens wear approved or prescribed for daily wear only	Rinsing in tap water
Swimming or water sports without wearing goggles	Wearing lenses when ill	Failing to rub and rinse lenses
Licking lenses or using saliva to wet	Extending wearing time or replacement schedule	Using incorrect solutions
Reinserting lenses from floor or other surface	Wearing lenses when the eyes do not feel good, look good and see well	Not storing lenses in lens case
Contaminating lenses with cosmetics, hairspray or other chemicals	Wearing damaged lens	Re-using or topping up solutions
Use of inappropriate or contaminated in-eye drops	Wearing lenses inside out	Not covering lenses with solution
Switching lens brand or fit without professional assessment	Wearing lenses beyond expiry date	Not storing lenses for recommended time
Sharing lenses	Not attending for regular check-ups	Not replacing bottle cap or closing it tightly
	Not having an up-to-date spectacle prescription	Not closing case tightly
		Not cleaning case and air drying daily
		Not replacing case regularly
		Sharing lens case
		Using solutions beyond expiry date
		Switching to inappropriate solutions

Infection is, however, only one potential consequence of failing to comply with instructions and, despite low levels of compliance, is thankfully relatively rare. Unsuccessful lens wear, discomfort, poor patient satisfaction, wasted time and money spent resolving compliance-related problems and contact lens drop-outs are other potential, and undesirable, effects.

Common non-compliant behaviours known to pose a high risk, such as sleeping in lenses, failing to wash hands and swimming without the use of goggles, should always be addressed in initial instructions. It is worthwhile reviewing all aspects of compliance to make sure instructions are as comprehensive as possible, not just at the initial fitting but at each aftercare visit.

For all contact lens types, patients who buy their lenses over the internet are less likely to adhere to instructions or attend for follow-up,⁶ and there is no opportunity for the eye care professional to review or reinforce best practices. Buying

lenses online or by mail order rather than from an eye care professional has also been associated with a greater risk of contact lens-related infection.⁴

These findings endorse the value of practitioners emphasising the importance of professional supply and advice, and the opportunities for intervention and education that regular aftercare provides. Such considerations have led many practitioners to change their professional fee structure or offer a monthly eye care plan or payment scheme that includes aftercare visits.

Since it is clearly impractical to cover every potential aspect of compliance at every visit, a pragmatic approach at each aftercare would be to focus discussion on key modifiable behaviours most likely to reduce risk. Any advice still needs to be tailored to the individual in terms of both content and, as we will see, the method of communication used.

Compliance with lens replacement

Despite the primary concern when daily disposables first became available that many patients would be reluctant to discard their lenses daily and were likely to re-use them, this has not proved to be the case. Jones et al⁷ were among the first to report that wearers of daily disposable lenses were more likely to be compliant with the prescribed wearing schedule than were other disposable and frequent replacement lens wearers (98% vs 89%).

Recent consumer surveys have supported this finding. In the US, a survey of wearers with recommended replacement intervals up to six months found that daily disposable wearers were the most compliant; 94% of wearers told to replace their lenses every day complied, less than 6% discarded lenses every two days and 0.5% waited up to a week before replacing their lenses.⁸ A recent study by Donshik et al⁹ found good correlation between the prescribed lens replacement schedule and patients' actual replacement schedule and that the recommended schedule was followed less as the replacement interval increased.

Morgan³ reported very high levels of compliance among daily disposable users in the UK, as many as 97% of wearers discarding their lenses on a daily basis, compared with 81% of two-weekly wearers and 82% of monthly wearers who replaced their lenses within the recommended period.

Compliance in medical fields

It is interesting to put the levels of compliance found in contact lens wearers in context with those found in wider medical fields. Compliance levels in general health care have been the subject of a vast body of research and can be instructive. A recent paper reviewed 50 years of research into patients' adherence to medical recommendations and involved a meta-analysis of 569 studies.¹⁰ The average compliance rate across all studies was 75%, although adherence varied widely according to the measurement method used and the disease condition. Adherence was highest in HIV disease, arthritis, gastrointestinal disorders and cancer, and lowest in pulmonary disease, diabetes and sleep disorders. Eye disorders showed a near average level, at 73%. Other authors have shown levels of compliance among glaucoma patients of 50-75%.¹¹

Seen in this light, it would seem that contact lens wearers take adherence to the correct procedures at least as, if not more seriously, as some other general health regimes, and this is particularly the case with compliance to lens replacement among daily disposable lens wearers. Morgan³ found that contact lens wearers understood that they were more likely to be at an increased risk of having an eye infection than non-wearers and that not following their lens care instructions

could increase the risk still further. This suggests that patients would be receptive to attempts by practitioners to reinforce instructions, which, in turn, should result in better compliance. In Morgan's study, 23% of wearers claimed they did not receive information or advice about complications or risks associated with contact lens wear. The opportunity therefore exists for practitioners to be more proactive, and to provide clear, targeted communication on the subject of compliance.

Identifying those susceptible

Reasons for contact lens wearers failing to comply and ways of identifying those most susceptible have been well covered in the literature and were summarised in a recent review article.¹

Work by Claydon and Efron in the mid-1990s looked at factors affecting compliance in contact lens wear, as well as in general health care, and is of particular interest.¹²⁻¹⁴ These authors found that few socio-demographic factors correlated consistently with non-compliance and most were non-modifiable. A better approach was to explore the health beliefs of the patient, attempt to change them and encourage motivation.

Several studies have used the Human Belief Model (HBM) of Becker and Maiman,¹⁵ developed to explain and predict compliance behaviour in health care, and applied it to contact lens wearers.¹⁶⁻¹⁸ This model describes attitudes in relation to four 'dimensions': susceptibility to contracting a medical condition; severity of the condition and its consequences; benefits of following medical advice; and barriers that influence a decision to follow advice. This model is summarised in *Figure 1*.

Figure 1: To enhance compliance, provide advice to patients, addressing all four dimensions of the Human Belief Model

Susceptibility	Eye problems can occur with contact lens wear, but compliance to professional recommendations minimises any risks. Highlight specific risk factors relevant to individual.
Severity	Communicate that vision loss is possible, but very rare.
Benefits	Following advice maximises comfort, vision and health. "Good Habits = Good Health"
Barriers	Recommend convenient routines - daily disposable - most convenient, removes many barriers.

An awareness of the four dimensions that resonate with patients can help to make any recommendations and communication on the subject of compliance more effective. A practitioner can highlight the relative risks of developing a problem through non-compliant actions, along with the potential consequences. Making a regime as straightforward to follow as possible is key in order to minimise any barriers in the patient's mind. As we will see later, this is one area where daily disposables have an advantage.

Getting the message across

Communication is a two-way process and starts as soon as the prospective contact lens wearer enters your practice. Communicating effectively will have a significant impact on compliance and this can be conveyed both verbally and non-verbally. More than 65% of communication is said to be non-verbal, which forms a key part in the patient-practitioner relationship and influences whether trust is established.¹ A simple measure such as washing and drying your hands in front of the patient at the start of each consultation can have as much effect as any verbal or written instructions.

Hygiene standards may be apparent from the patient's personal appearance alone but other factors will need to be elicited by careful questioning. Occupation and hobbies all give clues as to likely levels of patient compliance with lens wear and care instructions. Look out for work or leisure pursuits that might involve extended wearing hours or overnight use, and for situations where single-use lenses are an advantage but where hygiene may be compromised, such as swimming and sports.

Give verbal and written instructions at the initial fitting and make sure that all practice staff convey the same message. Most, but not all studies, have shown that verbal and written information is more effective in encouraging compliance than verbal instruction alone.¹⁹ Keep it simple: in particular, daily disposable wearers who have opted for a simple wear and care regime are likely to value simple, direct instructions. Providing patients with jargon-free, concisely written and clearly presented information, including clear diagrams, facilitates a partnership approach and improves patient satisfaction.²⁰ In the medical field, cartoon illustrations have proved to be an effective strategy for conveying information and may improve patient compliance with instructions²¹ (*Figure 2*). Use of cartoon images can be found in some contact lens literature; an example is shown in *Figure 3*. Using a more complex enhancement strategy, including video, booklets, posters, checklist and a health care contract, has been shown in one study to produce no significant improvement in compliance compared with a standard level of instruction.²²

The College of Optometrists' guidelines recommend that contact lens aftercare will include an assessment of the patient's compliance with the care regimen and general contact lens-related hygiene. Each aftercare visit provides an opportunity to check on current habits, reinforce previous instructions and to educate in revised practices where necessary. Morgan³ found that, during aftercare, 62% of wearers claimed that their practitioners asked how they took care of their lenses; this of course leaves a substantial proportion who did not.

Figure 2: Impact of written instructions for wound care with and without cartoons

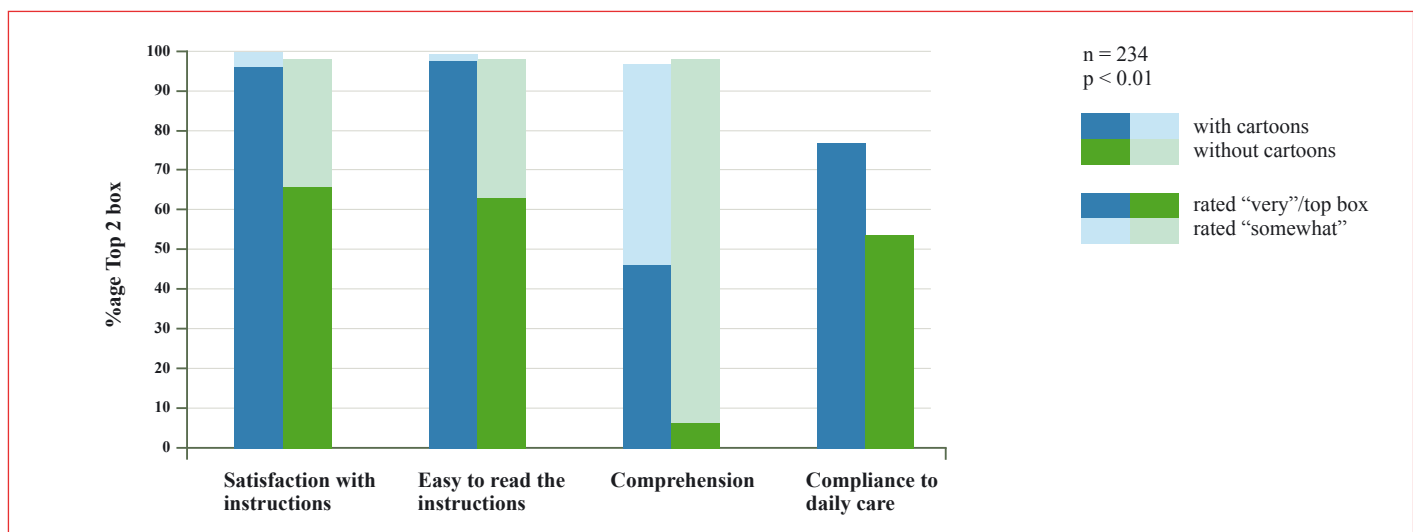
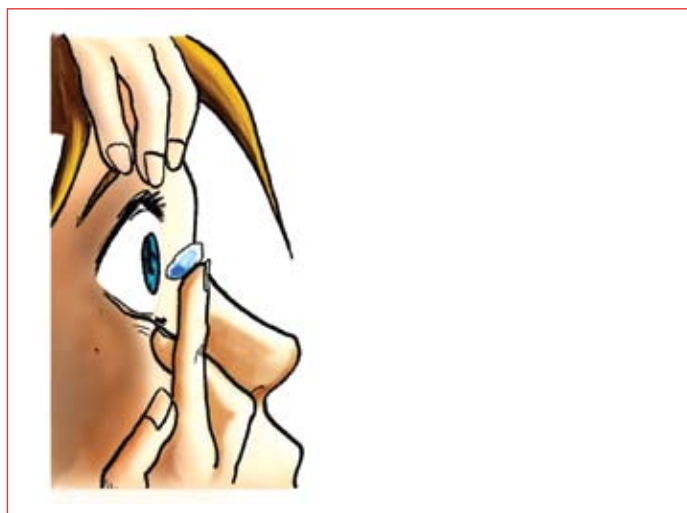


Figure 3: Cartoon image found in patient literature (Image courtesy of Suzanne Hunt www.monochromerainbow.com)



Use careful questioning with open questions to elicit non-compliant behaviours. Have the patient demonstrate their technique and, if necessary, physically show them how to wash their hands. The US Centers for Disease Control recommends that hands are washed by rubbing them vigorously for 20 seconds using non-perfumed soap and clean running water, then rinsed well with warm water and dried with a clean, lint-free towel.²³ Remind patients that they should always wash their hands prior to touching their eyes, as well as before lens application and removal

Use a memorable analogy for reinforcing lens replacement. Try simple reinforcement messages, such as ‘The lens should only ever come into contact with your clean finger or your eye.’ To avoid ‘scolding’ remember to have more do’s than don’ts in the message. Reinforcing good practices is as important as correcting poor habits. ‘Good Habits = Good Health’ is a simple phrase to convey the rationale for compliance. Text messaging schemes are available for consumers; ACCUMINDER™ from Johnson & Johnson Vision Care (*Figure 4*) is one example of this gaining increasing usage in the UK market – especially with the younger generation.

Supply and pricing considerations can also be used to aid compliance in daily disposable lens wearers. Some authors have suggested that tracking order patterns provides a useful tool in identifying patients who are non-compliant with their wearing and replacement schedule.²⁴ Offering a care plan that includes aftercare is as desirable for daily disposable users as it is for other lens types.

Figure 4: Patients can register for text message or email reminders www.acuvue.co.uk/acuminder




Daily disposable studies

In the UK, nearly half of all new soft lens fittings and one in three refits are now with daily disposables; single-use lenses have also gained wide acceptance for non-spherical prescriptions.^{25,26} It is worth bearing in mind that high levels of satisfaction with daily disposable lenses, and the low overall incidence of complications, are among the reasons why this has become the most commonly prescribed soft lens modality. Daily disposables are the modality with the lowest overall rate of contact lens-related complications and research indicates they are the most trouble-free way of wearing contact lenses.^{27,28}

Practitioners may be tempted to assume that prescribing a modality in which the lens is worn once and thrown away daily is the safest possible option and research would tend to support this view. It is understood that patients are more likely to be compliant when there are fewer steps in the process, and, as we have already shown, wearers of daily disposable contact lenses are the most compliant.

In the UK, daily disposable users have previously been shown to have the lowest incidence of non-severe keratitis of all soft lens types and only daily wear silicone hydrogels carried a lower risk of severe keratitis among soft lens users.²⁹

The recent studies by both Stapleton and Dart^{4,5} did not show a lower risk of microbial keratitis compared to other soft daily wear lenses. However, a couple of interesting points were highlighted. Firstly, from the Dart study,⁵ of those daily disposable users presenting with MK, 52% admitted to at least



occasional overnight wear. This highlights the importance of complying with the wearing regime, since a significant decrease in compliance was seen in the MK group compared to the control group. Secondly, in general, the daily disposable modality seems to be associated with the lowest risk of severe microbial keratitis.⁴ Other authors have observed that eliminating the storage case may reduce the likelihood of lens contamination by Gram-negative bacteria, which is associated with more severe disease.³⁰

That said, these findings suggest that there is no room for complacency when prescribing daily disposables. It would be unwise to assume that infection has been eliminated with this modality with current lenses. Practitioners should therefore take every opportunity to enhance patient compliance and minimise risk with daily disposables, as with all types of contact lenses.

Daily disposable features

Single-use lenses, used properly, have a number of inherent properties which aid patient compliance.

The daily disposable modality is simple and convenient and, because no case or solutions are used, avoids potential problems with case contamination, lens-solution interactions and solutions that are ineffective or past their expiry date. Remembering from Morgan³ the key features that should be concentrated on at aftercare visits to enhance compliance, ie case care, rubbing and rinsing lenses, overnight wear and use of the correct solution, it is immediately possible to see the advantages of daily disposables, where all but one of these issues is automatically eliminated (*Table 1*). Without the need for a case, cleaning regime or solutions, avoiding overnight wear is the only remaining instruction among Morgan's recommendations that needs to be given special attention at aftercare.

The disposable concept and low individual lens cost suggests these wearers may be more likely to remove and discard a damaged lens than re-usable lens wearers. They may also be more likely to remove a lens if their eyes do not feel good, look good and see well. Having their spectacles close to hand is important to enable this behaviour. As many as 40% of daily disposable users wear the lenses on a part-time basis (defined as no more than three days a week).²⁶ Intermittent use, alternating with spectacles, is more common with the daily disposable population as a whole, and wearers may therefore be more likely to possess an up-to-date spectacle prescription. Indeed many manufacturers specifically advise in their daily disposable patient literature that if a wearer runs out of lenses, spectacles should be

worn. Patient enrolment systems that allow automatic shipments to the practice, postal supplies direct to home and effective reminder systems all help to avoid running out of lenses.

Another compliance issue that is often neglected is lens care while travelling or on holiday, which has been identified as a risk factor for infection among contact lens wearers. Restrictions on liquids in carry-on luggage when flying mean that re-usable lens wearers may be tempted to decant solutions into smaller containers. Daily disposables have inherent advantages for travelling, especially on long-haul flights and in situations where hygiene is difficult to maintain.

As outlined above, daily disposable lenses have many advantages over re-usable lenses from the clinical and practical point of view. However, the very aspects that serve to help with compliance, for example the lack of case and cleaning solution, equally mean that the wearer does not have access to these tools. This is not a concern providing the wearer is compliant and does not reuse their lenses. Again, the importance of practitioner communication is paramount.

Some authors have suggested a tendency to prescribe daily disposables for patients who have had difficulty tolerating or carrying out hygiene procedures for re-usable lenses, or for activities that may predispose to infection, such as swimming and other sports resulting in eye contamination with soil and water.⁵ Concern has also been raised that, with daily disposables, convenience may be overemphasised by some practitioners at the expense of compliance, and insufficient advice given.³¹ It is important to understand the reasons why daily disposables have been prescribed to a patient, and to reinforce the importance of compliance in order to address these two areas.

Re-using daily disposables will expose wearers to risks of infection and wearers should always be made aware of this. Accentuating the positive aspects of single-use lenses, by highlighting the comfort, convenience and health benefits, will further encourage patients to comply with single use.

Having reviewed and reinforced the value of single use, attention should also be paid to instructions for general hygiene. These basic behaviours are, of course, just as important for wearers of daily disposable lenses as they are with other lens types. *Table 2* summarises some of the key tips that can be provided to enhance compliant behaviour in daily disposable wearers.

Table 2: Top 10 Tips for promoting compliance in daily disposable wearers

1.	Keep the message simple, since these wearers value simplicity
2.	Stress the benefits of using the lenses for <i>single use, daily wear only</i> (comfort, health and convenience) and reinforce the risks of incorrect lens use or overnight wear
3.	Give verbal and written instructions on lens wear and care, tailored to daily disposables
4.	Question the patient carefully at each aftercare visit and reinforce instructions
5.	Don't assume that if wearers do discard their lenses daily they are fully compliant
6.	Be aware that infections can and do occur with daily disposables
7.	Focus discussion on key modifiable behaviours most likely to reduce risk in this group
8.	Demonstrate and have them demonstrate correct hand washing
9.	Make sure your supply and pricing policies encourage compliance
10.	Ensure spectacle prescription is current and dispensed

Conclusion

Encouraging compliance is a key issue for eye care professionals and the contact lens industry if patients are to wear their lenses successfully. Recent studies have provided new information on non-compliant behaviours and related them to risk factors for ocular infection among contact lens wearers. Single-use lenses, used properly, have a number of inherent properties which aid patient compliance. Daily disposable wearers show high levels of compliance to lens replacement but there are many aspects of lens wear and care that should be adhered to even when lenses are discarded daily. Practitioners should take every opportunity to encourage patient compliance and avoid complacency with daily disposables, as with all types of contact lenses.

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