Repairing Contact Lens Care

Teaching patients why proper lens wear and care are essential will encourage them to choose adherence.

By Brian Chou, OD, FAAO

...patients get the impression that contact lenses are non-prescriptive and that lens care is irrelevant.

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In years past, patients did whatever their physicians instructed, without question. Patients who didn't comply were deviants breaking the rules; people unable to follow directions. Indeed, "compliance" implies a passive, one-way relationship wherein a practitioner makes a demand for a patient to follow. In contrast, "adherence" suggests an active interaction between patients and doctors wherein a patient voluntarily accepts his practitioner's prescribed treatment.

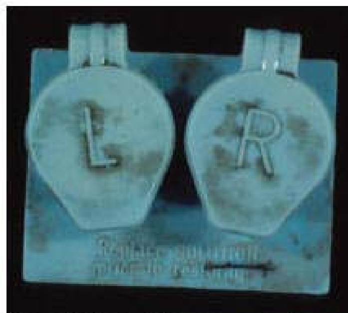
The concept of adherence is more applicable today. The reality is that practitioners are no longer the stalwart and exclusive sources of healthcare information that they were in the past. Today information comes from multiple sources, including direct-to-consumer advertising, the Internet, the lay media and even friends and family. Some call it patient empowerment. Yet which sources do patients believe when the information is contradictory or incomplete?

So Many Choices

Suppose you prescribe Mrs. Smith Brand X soft contact lenses. You instruct her to remove the lenses daily and to discard them monthly while using a specific multipurpose solution. After all, you know this regimen is best for her. In the compliance model, you wouldn't need to explain your prescribing rationale.

However, in the adherence model, you must have the real-life awareness that Mrs. Smith may question it. Maybe she'll go off course after seeing a TV advertisement for Brand Y contact lenses. Maybe it'll happen after she sees the labeling on the Brand X box that promotes the lenses as FDA approved for extended wear up to one month. Or maybe it'll occur when her best friend tells her that she can wear her contact lenses twice as long before replacing them. Maybe it'll happen when she's in the drugstore aisle and gets overwhelmed after seeing the large number of displayed multipurpose solutions (Figure 1). Patient adherence requires practitioners to proactively educate patients about the benefits and costs of the prescribed treatment for the enhancement of therapeutic outcome.

The recent events related to *Fusarium* keratitis have led some of us, including myself at one point, to reflexively blame patient noncompliance as a significant causative factor. But patient compliance hasn't suddenly gotten worse. Noncompliance has existed for a long time. As early as 200 B.C., Hippocrates advised physicians to consider noncompliance when the usual successful treatment didn't produce the expected result (Carr, 1990).



An often neglected aspect of contact lens hygiene lens case replacement.

Looking Through Rose-Tinted Lenses

Practitioners may actually be poor judges of patient compliance/adherence. In one evaluation of 138 patients who had pulmonary disease, a significant disparity existed between physician evaluations of patient compliance and corresponding patient accounts (Goldberg et al, 1998). Another study compared 320 paired cases of patient-reported and physician-estimated compliance to a specific type of HIV therapy (Murri et al, 2004). Physicians failed to correctly estimate patient-reported compliance to the therapy in 111 cases, or in more than one-third of patients.

The results of these two studies suggest that physicians have difficulty accurately appraising compliance in their patients. These results should also prompt us to consider how our patients accept our recommendations on contact lenses and lens care. Maybe it comes as no surprise that Castellano (2004) reported that roughly one-third of patients follow our directions exactly, one-third follow some of our instructions and the remaining one-third don't follow any of our instructions.

Looking at the contact lens literature, Claydon and Efron described in a 1994 review article that between 40 percent and 91 percent of contact lens patients are noncompliant. Collins and Carney (1986) found that noncompliance with lens care correlated to an increased incidence of corneal staining and lens surface deposits. Corneal staining is important, even if asymptomatic, because it represents a breach in the barrier integrity that can permit microbial invasion into the cornea.

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Changing Tactics

Has our industry adequately communicated that contact lenses are prescriptive devices that require professional supervision and appropriate lens care? All of us in the industry share some responsibility in supporting this message — from contact lens and solution manufacturers to practitioners and staff and alternative distributors. The partnership between manufacturers and prescribing practitioners is perhaps the cornerstone in presenting a unified patient message.

Yet contact lens manufacturers have sometimes created consumer perceptions that are at odds with practitioner efforts. Direct-to-consumer advertising including free trial lens coupons and sweepstakes promotions exemplifies how certain manufacturers drive new demand. But if done without disclosing risks, these strategies may undermine practitioners' efforts to get patients to adhere to proper contact lens wear and care regimens. Free product coupons, promotional tie-ins with free MP3 music downloads and travel sweepstakes are more typical for retail goods sold in department stores than for medical devices. After all, when was the last time

anyone could win an exotic vacation for getting an artificial heart valve or replacement knee joint? The result of these promotions is that some patients get the impression that contact lenses are non-prescriptive and that lens care is irrelevant.

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The quandary practitioners now face is how to encourage patients to adhere to sound contact lens wear and care regimens under circumstances like these. Of course, practitioners can't directly control the marketing strategies of medical device manufacturers; but they can tell their manufacturer representatives what will better serve the interests of patients and will help improve patient adherence.
Meanwhile, practitioners and their staff members remain at the front line for modifying patient behavior through their direct interaction. What works to increase compliance? Clinical psychologist Alan Carr has pointed out several key areas based on research in a 1990 article:

- Don't keep your patients waiting. Patients seen promptly are more apt to follow your directions.
- Converse with your patients in a friendly and informal style. Doing so encourages patients to share useful information.
- Present the treatment regimen and rationale in easy-to-understand, memorable language. Use short sentences and state the most important aspect of treatment first.
- Evaluate your patient's understanding and expectations about the treatment. Compliance is correlated with patients' beliefs about their vulnerability to illness, the seriousness of illness and the efficacy of appropriate treatment.
- Find out how much information your patient wants to know. Some want a cursory explanation while others want to know it all. Tailor your discussion to meet each patient's expectation.
- Help patients appreciate the negative consequences of non-compliance and the benefits of compliance.
- Enlist the help of a patient's family or friends in following your advice.
- Review compliance at each follow-up consultation.

Armed with strategies for enhancing patient adherence, the challenge remains to encourage our patients to develop proper habits for lens replacement, application, removal, cleaning and disinfection.

Tackle Infrequent Lens Replacement

Regardless of the intended lens replacement schedule, it's no secret that too many patients make their lenses last too long. At the expense of eye health, some patients wear lenses until they're torn, fouled with deposits or otherwise too uncomfortable to wear.

Take for example a patient who is a full-time contact lens wearer and makes a 12-month supply of lenses last for two years. In such cases, our responsibility is to educate patients about why they should more regularly replace their lenses. This is no different than a primary care physician's obligation to act when a hypertension patient tries to make 12 months of blood pressure medicine last twice as long.

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Clean Hands and Clean Cases

In any healthcare setting, good hygiene in handling contact lenses requires hand washing. Hand washing before lens removal is important, but it's even more so before lens application. Lens handling is the most likely source of contact lens contamination (Mowrey-McKee, 2002).

A 2002 review article by Montville indicated that hand washing reduces microorganisms by about 2 to 4 logs (100 to 10,000 times). Even with hand washing, an estimated 1,000 to 1 million organisms get on each lens. Mowrey-McKee and co-workers (Mowrey-McKee 1992, Hart 1993) looked specifically at contact lens contamination from handling after hand washing. Their results indicated that lens removal contaminated nearly organism-free lenses from the eye with an average of 653 colony forming units per lens. Nearly 95 percent of lenses showed bacterial contamination and 11 percent showed contamination with fungi including both yeasts and molds. Of note was the fungal presence in this study, which was performed in Rochester, New York. A higher rate of fungal contamination may have occurred had the researchers performed this study in the tropical Far East or in southern Florida.
We've all witnessed patients in our offices removing and applying contact lenses without hand washing. Rather than pretending we didn't observe these behaviors, we should take the opportunity to educate patients about the potential consequences of poor hygiene and about the benefits of hand washing.

Finally, an often neglected aspect of contact lens hygiene is the lens case. Most clinicians have observed cases so filthy that words can't sufficiently describe them (Figure 2). In a *Fusarium* case-controlled study, Chang (2006) found no correlation between the fungal infections and frequency of lens case replacement. Regardless, it's prudent for patients to replace lens cases at least every three months. Between those periods, proper lens case cleaning is necessary. In the past, a common recommendation was rinsing the case with hot tap water and letting it air dry. It now appears that rinsing the case with disinfecting solution and then air drying is a better course.

The Rub on Cleaning Contact Lenses

No-rub multipurpose solutions entered the market in 2000. These solutions are intended to minimize lens deposit formation without a rubbing step in lens cleaning while also removing microorganisms. No-rub solutions have demonstrated that they reduce the levels of the primary proteins on lenses (Hong 2005) and prevent the formation of visible deposits.
Patients frequently don't recognize that no-rub solutions require a rinse step to achieve effectiveness. Houlsby (1984) found that rubbing alone with solution removed about 98 percent of lens microorganisms while rinsing alone removed nearly 99 percent of microorganisms. These results suggested that the rubbing step may not be necessary as long as rinsing is performed. However, Houlsby's study was limited to hydrogel lenses of the early 1980s. Silicone hydrogel lenses may have changed the dynamics of these observations because silicone hydrogels appear to deposit lipid at a greater rate than do hydrogels (Jones, 2003).

In the case-controlled study of *Fusarium* (Chang, 2006), 68 percent of control patients failed to rub their lenses at least sometimes while 54 percent never rubbed their lenses. The lack of lens rubbing was not a risk factor for fungal infection identified in the study. Still, gently rubbing lenses is a prudent step unless future evidence suggests otherwise.

Topping Off on Disinfection

Both patients and practitioners confuse the disinfection/soaking step with cleaning. Disinfection specifically relates to reducing the number of microorganisms on the contact lens. It has nothing to do with lens deposit removal. For a multipurpose solution to earn labeling as a disinfecting solution, the current FDA standard requires the product to reduce 99.9 percent of colony forming units of bacteria and 90 percent of colony forming units of fungi. For a lens care product to earn no-rub labeling, it must reduce the inoculums of each challenge organism, both bacteria and fungi, by 99.999 percent using the labeled regimen.

What can go wrong with lens disinfection? First and foremost is reusing solutions or "topping off." This practice by patients is rampant based on reports of product consumption by solution manufacturers. Chang (2006) found in the case-controlled study of the *Fusarium* outbreak that patients who topped off were on average 3.2 times (between 1.2 times and 9.4 times) more likely to be in the group who developed *Fusarium* infections compared to controls. Another researcher has suggested that topping off is like reusing today's dirty dish water for tomorrow's dishes. Reusing solution is concerning because of the potential of the solution to lose disinfection efficacy. Rosenthal (2002, 2006) has demonstrated that some solutions lose their disinfection capacity after soaking certain types of lenses because the lens matrix absorbs some of the active disinfecting compounds.

The absorption of active biocides from disinfecting solutions into the lenses points to a second issue: The application of lenses containing the absorbed biocide may result in the release of high concentrations of biocide on the eye, resulting in corneal staining. Papas at BCLA (2006) reported that patients exhibiting toxic corneal staining were 4.02 times more likely to experience corneal infiltrates. Andrasko (2006) has shown that certain combinations of lens materials and multipurpose solutions are more prone to causing corneal staining. Andrasko's ongoing work is updated on the website www.StainingGrid.com. His findings suggest that practitioners should guide their patients to use specific lens care products depending on the prescribed lens material.

A Paradigm Shift

Instead of viewing resistance to change as stemming from only our patients, we must accept that some of the resistance comes from the way we communicate with patients. The old concept of compliance, where advice is doled out even when not requested, isn't adequate to motivate patients to change their daily habits. Instead, practitioners might consider a negotiation-based framework that harnesses patients' intrinsic motivation to make their own decisions (Butler, 1996). This approach requires us to accept patient decisions, even if those decisions run counter to current medical wisdom. In this manner, we can make progress in getting patients to heed our recommendations about lens replacement, maintaining good hygiene and proper use of lens care products. CLS

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To obtain references for this article, please visit http://www.clspectrum.com/references.asp and click on document #135.

Contact Lens Do's and Don'ts for Patients

DO Always wash your hands before applying or removing your contact lenses.

DO After taking the lenses out of their case, rinse the case with disinfecting solution and let it air dry.

DON'T Don't ever reuse the solution in the case. When soaking lenses, dump out old solution from the case and use fresh solution. Expect to use 8 to 12 10-fluid-ounce bottles per year.

DON'T Don't switch brands or use generic alternatives without first consulting your eyecare practitioner — always use the lens care products your practitioner recommends.

DO Although most multipurpose solutions are "no rub," it's safest to gently rub the lenses — especially the newer silicone hydrogel contact lenses.

DO Replace your lens case at least every three months, even if it still looks clean.

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Introducing LensAlert! contact lens and case replacement timers.

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