TECHNICAL REPORT

Technical Report: Guidelines for Handling of Multipatient Contact Lenses in the Clinical Setting

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SIGNIFICANCE: Standardized guidelines that are clinically practical are needed to assist the prescriber in minimizing the risk of conveying infection through multiuse diagnostic contact lens use and reuse.

Contact lens prescribers face the specter of transferring potential pathogens from one patient to another when reusing diagnostic (trial) contact lenses on multiple patients because infectious organisms have been recovered from worn contact lenses, although there is no evidence of transmission through this mechanism. These pathogens can be introduced into the system from one patient to another, or they may be introduced by clinician lens handling, storage, or both. These pathogens can cause acute or chronic systemic or ocular infection that can lead to significant morbidity (temporary or permanent) that includes vision loss.

Infection from a contact lens can potentially occur by single or multiple microbial agents, such as bacterial, fungal, viral, parasitic, or amoebic, or other transmissible pathogens.1–5 Each microbe has different avenues and barriers to a lens, and their respective survivability can depend on the lens material (soft hydrogel lenses, gas-permeable plastics, and variations in polymers from different manufacturers), as well as the disinfection solution, the lens case, and modifiable practice habits such as hand hygiene. In light of these risk factors, it is best to use single-use disposable products and empirical fitting whenever possible.

It is understood, however, that single-use lenses or empirical fitting is not always feasible, secondary to cost, accessibility, and complicated ocular conditions. Disinfection standards, to date, address the risk of a single user of the contact lens in a personal home environment. However, hygienic management of multipatient use diagnostic lenses differs from hygienic management of contact lenses for personal use and from surface disinfection used in hospitals and clinics.

These guidelines have been developed in cooperation with the American Optometric Association Contact Lens and Cornea Section and the American Academy of Optometry Section on Cornea, Contact Lenses and Refractive Technologies based on the recommendations within the 2018 standard from the International Organization for Standardization (ISO) 19979:2018(E) (referred to throughout as the 2018 ISO Standard)5 to prevent vision and eye health compromise among patients requiring fittings with reusable diagnostic contact lenses, from potentially infectious agents on various trial lens materials. For this article, cleaning will refer to the removal of deposits, debris, and some organisms from the surface of lenses. Disinfection will refer to the killing of most but not all microbial forms (e.g., bacterial endospores and fungal spores) on the surface of (and sometimes within) the trial lenses, which is different from sterilization, which eliminates all viable organisms. Manufacturers may provide their own disinfection and storage guidelines for their diagnostic lens sets, which should be followed if they differ from these recommendations.

CONTACT LENS DEFINITIONS ADAPTED FROM THE 2018 ISO STANDARDS

Trial Contact Lens/Diagnostic Contact Lens

These are contact lenses used only by a practitioner or fitter for the purpose of selecting the appropriate contact lens parameters for the intended wearer.
Multipatient Use Trial Contact Lens

Trial contact lenses are permitted to be used on more than one person.

TYPES OF LENSES WILL FALL INTO THREE CATEGORIES FOR IN-OFFICE DISINFECTION PURPOSES

- Soft contact lenses (hydrogel): to include silicone hydrogels, HEMA hydrogels
- Gas-permeable contact lenses: to include corneal and scleral lenses
- Hybrid contact lenses (composite): gas-permeable center attached to an outer “skirt” made of soft contact lens material

GENERAL CLINICAL PRACTICE HYGIENE

1. Contact lenses must be disposed immediately after use in individuals with the following infections:
   - Hepatitis
   - HIV
   - Prion disease
   - Herpes ocular infection
   - Adenovirus
   - Acanthamoeba keratitis

2. Contact lenses are routinely used to assess resultant visual acuity after corneal scarring secondary to ocular infections. All trial contact lenses used in patients who are carriers (or identified as potential carriers) of infectious diseases (e.g., Creutzfeldt-Jakob disease, herpes simplex virus, hepatitis, HIV, or adenovirus) must be disposed of immediately after use, as supported by the ISO Standards and other optometric practice guidelines. Such organisms either have potential prolonged survival outside the host, ocular reservoirs with theoretical risk of transmission, latency, or encystment or remain detectable in tears despite an otherwise quiet host. For bacterial and fungal keratitis, if the ocular infection is active, the lens must be disposed. Otherwise, when fitting over inactive corneal scars without signs of infection or inflammation after bacterial and fungal keratitis, the disinfection procedures described herein should be followed.

3. When disposing lenses in the aforementioned scenarios, use single-use gloves while handling and dispose of containers touching contaminated lenses. Treat the lenses as biohazardous waste and dispose of accordingly.

4. Office staff hygiene can be a factor in transmission of disease. The following is recommended for hand hygiene:
   - When cleaning your hands with soap and water:
     - Wet your hands first with water, apply the amount of product recommended by the manufacturer to your hands, and rub your hands together vigorously for at least 20 seconds, covering all surfaces of the hands and fingers.
     - The U.S. Food and Drug Administration states that over-the-counter antibacterial soaps are not better at preventing illness than washing with plain soap and water and has issued a rule to address data gaps for certain active ingredients in health care antiseptics. However, the Centers for Disease Control and Prevention states that health care workers should continue to use health care antiseptic products currently recommended by professional and national guidelines including the Centers for Disease Control and Prevention and the Healthcare Infection Control Practices Committee infection control guidelines and consistent with facility policy.
   - Rinse your hands with water and use disposable towels to dry. Use towel to turn off the faucet.
   - Avoid using hot water to prevent drying of skin.

5. Additional Centers for Disease Control and Prevention infection control guidelines for health care surfaces and equipment can be found at: https://www.cdc.gov/infectioncontrol/guidelines/disinfection/index.html. In addition, one should follow the equipment manufacturer's instructions for cleaning and disinfection.

6. Office staff should adhere to discard and expiration dates of all solutions used for disinfection.

DIAGNOSTIC LENS CLEANING AND DISINFECTION

1. Immediately after use, all lenses should be rubbed with a daily surfactant cleaner according to the instructions of the manufacturer. Daily cleaners are intended for cleaning—not disinfecting—contact lenses. The cleaner removes particulate matter and removes deposits and debris from the contact lens ensuring more effective disinfection. Practitioners should use the daily cleaner and carefully rub the contact lens as instructed and must use additional products, such as multipurpose or saline solution, for rinsing the daily cleaner off (Fig. 1).

2. After cleaning, the trial lens should be visually inspected for any damage or defects. If damaged, the lens should be discarded. Otherwise, proceed to disinfection.

3. Disinfection of gas-permeable or PMMA lenses:
   - Use a commercially available hydrogen peroxide contact lens disinfecting solution currently approved for contact lenses.
   - The 2018 ISO Standard recommends a minimum of a 3-hour soak in nonneutralized ophthalmic grade 3% hydrogen peroxide.
   - Note that this means using commercially available hydrogen peroxide contact lens disinfecting solutions in an off-label manner by not incorporating the neutralizing disk or tablet during the soaking step.
# Handling Multipatient Contact Lenses

**Gas permeable**

1. Place 3% hydrogen peroxide with GP lens in a non-neutralizing case.

2. Disinfect lens for 3+ hours.


**Hybrid and Soft**

1. Place 3% hydrogen peroxide with soft or hybrid lens in non-neutralizing case for 3+ hours.

2. Transfer soft or hybrid lens to a neutralizing case. Fill with fresh 3% hydrogen peroxide. Add neutralizing disc or tablet as recommended by manufacturer.

3. Neutralize lens for 6+ hours, or as directed by manufacturer.

4. Rinse soft or hybrid lens with MPS. Store in a disinfected case with MPS.

- Clean and rinse lenses immediately after use.
- Multipurpose solutions are acceptable for rinsing.
- ISO recommends this process every 28 days for soft or hybrid diagnostic lenses if they have been opened and not re-used and subsequently re-disinfected in that time period.

These methods have been approved by the American Academy of Optometry Section on Cornea, Contact Lenses and Refractive Technologies and The American Optometric Association, Contact Lens & Cornea Section adapted from the Standard of the International Organization for Standardization (ISO); ISO 19979:2018(E).

Created by Angelica Polizzi, OD

**FIGURE 1.** In-office disinfection of multipatient use diagnostic contact lenses.
c. Lenses should be thoroughly rinsed with sterile saline or multipurpose solution and stored dry.

d. Tap, bottled, and well water should be avoided at all times because of potential *Acanthamoeba* contamination found in most municipal drinking water supplies.

e. Gas-permeable lenses should be recleaned and rinsed before insertion (after dry storage).

4. Soft and hybrid contact lenses

a. Use a commercially available hydrogen peroxide contact lens disinfecting solution currently approved for contact lenses.

b. The 2018 ISO Standard recommends a minimum of a 3-hour soak in nonneutralized ophthalmic grade 3% hydrogen peroxide.

i. Note that this means using commercially available hydrogen peroxide contact lens disinfecting solutions in an off-label manner by not incorporating the neutralizing disk or tablet during the soaking step.


c. After the 3-hour soak time, the solution should be neutralized according to the manufacturer’s recommended guidelines.

i. Add neutralization tablet for time as suggested by manufacturer or

ii. Discard used peroxide solution and neutralize following the manufacturer’s recommendations (e.g., place in a manufacturer-provided container with fresh hydrogen peroxide solution and neutralizing disk for suggested time)


d. After neutralization, the lens should be rinsed with saline or multipurpose solution and stored as follows.

e. When transferring lens, use sterile cotton swab or contact lens tweezers.

f. Multipurpose solutions can be used to store diagnostic contact lenses in sealed containers.

i. Label the disinfected diagnostic lens with the disinfection date.

ii. 2018 ISO Standards suggest repeating the disinfection every 28 days if the lens has not been used.

5. Moist heat disinfection/autoclaving

a. This is an option for hydrogel lenses, but never for hybrids.

b. The 2018 ISO Standards recommend the following:

i. Place lens into 0.9% sodium chloride solution in a borosilicate glass vial with crimped seal.

ii. Disinfect with a target temperature of 134°C for a minimum of 3 minutes or 121°C for a minimum of 15 minutes.


c. Caution must be taken to ensure that the lens is clean before disinfection to prevent any deposits, and so on, becoming more firmly attached to the lens surface during heating.

6. If not provided by the manufacturer, practitioners should seek guidance from the manufacturer on the criteria for discarding the trial lens, for example, the number of times the trial lens can be reused and/or the expiration date of the trial lens after first use.

a. Do not place used/soiled lens directly back into the storage container after removal from the eye. Place in disposable container until disinfection is complete.

b. Replace the lens container whenever possible. Microbial contamination and biofilm formation are known to increase over time.

c. The disposable plastic/rubber stopper in glass bottle should be disinfected with nonneutralized ophthalmic grade 3% hydrogen peroxide for, at minimum, 3 hours and rinsed with saline or multipurpose solution before reuse or replaced with a fresh stopper.

d. Each lens container should be disinfected with nonneutralized ophthalmic grade 3% hydrogen peroxide for, at minimum, 3 hours. Rinse thoroughly with multipurpose solution or saline.

i. This step may be coincident with the lens disinfection step.

ii. If coincident with lens disinfection, once the lens is removed, cap the container, and invert and shake vigorously to also disinfect beneath the cap.


e. Glass contact lens storage cases may be disinfected using moist heat disinfection at 134°C for 3 minutes or 121°C for 15 minutes.

f. Lens containers should be then labeled with the following information:

i. Lens identification number if there are multiple lenses of the same parameters

ii. Lens material and lot number, if available

iii. Lens parameters, including the following:

1. Lens design
2. Power
3. Diameter
4. Curvature or equivalent readings
5. Other parameters specific to lens design
iv. Last disinfection date

1. If stored wet, the lens and containers must be re-disinfected and storage solution replaced after every 28 days.

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**DOCUMENTATION**

1. The 2018 ISO Standards suggest maintaining a record of each disinfection; clinical practices should maintain a log within each fitting set documenting the following:

a. Reference number for each lens

b. Patient reference for each lens

i. Important if subsequent infection is diagnosed and was present during fitting

ii. Can be used to contact subsequent patients fit with the diagnostic lens to advise of potential risk

c. Date(s) of use

d. Date(s) of disinfection

e. Method of disinfection (e.g., peroxide and moist heat)

f. Person performing disinfection (supporting competent personnel with training record)
BOTTOM LINE

1. The ideal approach for trial contact lenses is to use the lens a single time, after which the lens is dispensed to the same individual or discarded. Where reuse is necessary, moist heat management is preferred over chemical management whenever applicable per the 2018 ISO Standards.

2. Contact lens practitioners should take every precaution to limit multipatient contact lens transmission of disease by educating themselves and their staff on best practices for disease control. This includes the techniques of hand washing, gloving, disinfection of instruments, contact lenses, storage cases, and management of in-office contact lens solutions.

3. If an option is based on patient’s individual needs, empirical fitting without the use of a trial lens is suggested.

4. When disinfection of diagnostic lenses is required, Fig. 1 is a quick reference guide useful for the contact lens practice.

REFERENCES


