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Morgan Lens Ocular Irrigation Protocol

Purpose: To outline a standardized training protocol for **eye irrigation** using the Morgan Lens in urgent care/emergency settings, with a focus on the clinical evidence supporting simultaneous irrigation of **both eyes** in chemical splashes and non-embedded foreign body injuries. Prompt, thorough irrigation of **both eyes** is crucial because many serious eye exposures affect ***both*** eyes (even if only one eye is overtly symptomatic), and failing to treat the "less affected" eye often leads to overlooked injury and long-term damage. This protocol ensures staff understand *why* and *how* to perform bilateral irrigation to prevent complications and preserve vision.

General Information & Rationale

Emergency ocular injuries – especially **chemical burns**, caustic splashes, and **airborne foreign bodies** – frequently involve **both eyes**. Patients may focus on the more painful eye, not realizing the other eye was also exposed. In fact, about **47% of chemical eye injuries are bilateral**[i]. Additionally, severe pain or nerve damage in one eye (common with alkali burns) can *mask pain* in the other eye[ii], giving a false sense that only one eye is affected. **Clinical guidelines advise us to assume both eyes are exposed to any significant chemical injury and to begin irrigation in both eyes immediately**.

> **Evidence Snapshot:** *"Ocular injuries are often bilateral, but the pain in one eye may mask the pain in the other... Unless the second eye is completely pain-free and no pathology is discovered, immediate irrigation should be started in both eyes."*
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> This recommendation from the Morgan Lens manufacturer echoes expert consensus in emergency ophthalmology texts, which note that even though most chemical burns are unilateral, **"bilateral involvement is present in ~47% of cases"**, so the provider should "consider that both eyes have been exposed and begin bilateral irrigation".

Why Bilateral Irrigation? Treating **both eyes** ensures that no occult injury is missed. By irrigating both eyes, clinicians:

Protect the "quiet" eye: Bilateral irrigation is essential even if one eye appears uninjured. This approach prevents hidden chemical or particulate matter from causing delayed corneal injury, as mild exposures may still result in ulceration if not promptly irrigated.

Prevent Secondary Damage: Immediate irrigation of both eyes minimizes the risk of subsequent complications, such as corneal scarring and persistent irritation, in the eye that initially seems unaffected. Unilateral irrigation risks unrecognized injury progression in the contralateral eye.

Follow "better safe than sorry" principle: The minimal additional effort required to treat both eyes is outweighed by the potential for irreversible vision loss in an untreated eye. The Morgan Lens system enables simultaneous bilateral irrigation with a single IV setup, facilitating efficient, hands-free care and minimizing staff burden.

Device Specific Precautions: The Morgan Lens is for professional use, a prescription-only, sterile medical device intended for single use by trained healthcare professionals. Do not use it if packaging is compromised. Reusing or resterilizing the device poses infection and device integrity risks. Proper disposal and regulatory reporting are mandatory for any adverse events. Serious incidents must be reported to the manufacturer and relevant authorities.

In summary, **bilateral eye irrigation is the standard of care** for chemical splashes and any situation where one cannot be 100% certain that only one eye is involved. This protocol incorporates that standard throughout indications, procedures, precautions, and training points must be followed.

Indications (When to Use Morgan Lens Irrigation)

- Use the Morgan Lens for continuous eye irrigation in the ER Department and Urgent Care whenever intensive flushing is needed to prevent injury, including:
- **Chemical Burns or Caustic Splashes (Acid or Alkali):** Immediate Morgan Lens irrigation is indicated for any chemical exposure to the eye, including cleaning agents, industrial chemicals, battery acid, bleach, and pepper spray. Even if the patient reports only one eye is affected, initiate bilateral irrigation unless the contralateral eye is unequivocally unaffected. Chemical injuries constitute vision-threatening emergencies; prompt irrigation of both eyes is critical to minimize tissue damage.
- **Non-Embedded Foreign Bodies:** Surface debris such as sand, metal shavings, glass fragments, or wood that have not penetrated the globe should be irrigated thoroughly. Morgan Lens use is appropriate when simple rinsing or swabbing fails to remove all particles. For instance, after extracting a visible foreign body from one eye, bilateral irrigation is recommended to eliminate micro-particles, as high-velocity debris or wind may affect both eyes.
- **Foreign Body Sensation with No Visible Object:** If a patient experiences gritty pain or tearing without a visible object on examination, assume possible micro-particles in the fornices. Irrigation with Morgan Lens is warranted—when one eye is involved (e.g., dust exposure), the other may also contain particles. Bilateral irrigation ensures comprehensive removal.

Severe Bilateral Irritative Exposures: In cases of chemical explosions, hot liquid splashes, or accidents where both eyes are clearly exposed, immediate Morgan Lens irrigation should be performed bilaterally. Rapid deployment is essential in these scenarios.

- **Significant Eye Irritation from Unknown Causes**: For patients presenting with intense eye pain or redness after an incident without a clear source (e.g., exposure to chemical mist), empirical irrigation is indicated. Any symptoms in the second eye (burning, blurred vision, mild pain) warrant bilateral irrigation.

Rationale: Morgan Lens use is indicated in any scenario requiring large-volume irrigation to prevent damage to ocular tissues. Since speed of irrigation is paramount to outcomes, the Morgan Lens allows irrigation to start and continue effectively. Importantly, when these indications are present, they often apply to both eyes, as noted. Emergency guidance is "initiate bi-lateral irrigation first and ask questions later" – meaning begin flushing both eyes even before completing the full history or exam if a chemical exposure is evident.

Contraindications

Few situations preclude Morgan Lens use, but it's critical to recognize them:

- **Penetrating Eye Trauma or Ruptured Globe:** If you suspect an open/globally ruptured eyeball (e.g., full-thickness laceration, penetrating metal fragments, obvious collapse of eye structure), **do not insert a Morgan Lens**. Any pressure or contact on the globe could worsen the leak or injury. In these cases, shield the eye (without pressure) and transfer the patient for emergency ophthalmologic surgery[iii]. (If one eye is penetrated but the other suffers a chemical splash, irrigate the chemical splash eye only, and avoid manipulating the injured eye.)
- **Protruding Foreign Body** — If an object is protruding from the eye, Morgan Lens' use is contraindicated.
- **Suspected or Confirmed Rupture of the Globe** — Avoid any device insertion in these cases.

Note: Having a contact lens in the eye is **not** a contraindication – you should still begin irrigation immediately; the contact lens will often flush out or can be removed once irrigation is completed. Similarly, corneal abrasions are not contraindications; in fact, Morgan Lens' irrigation can help by keeping the eye moist and clean while preventing eyelid friction on the cornea.

Equipment Needed

For rapid, effective bilateral eye irrigation, have these essentials ready:

- **PPE**—Gloves, gown, and face shield as needed for caustic exposures.
- **IV Pole or Hook**—For hanging fluid bags, using gravity for flow.
- **IV Fluids**—1–2 liters of Lactated Ringer's (preferred) or Normal Saline. Keep extra bags handy; irrigate until pH normalizes.
- **Topical Anesthetic Drops**—Proparacaine or Tetracaine, for patient comfort.
- **Morgan Lenses (2)**—One for each eye. Sterile, single-use. Always use one per eye.

- **Morgan Lens Delivery Set (Y-tubing)**—Connects both lenses to one fluid bag for simultaneous irrigation. If unavailable, use two separate administration sets, but the Morgan Lens Delivery set with the Y-tubing is preferred.

- **Medi-Ducts (2)**—One to the side of each eye to collect fluid and prevent mess.

- **Tape** —Secure tubing.

- **pH Test Strips**—Check ocular pH before, during, and after irrigation (when dealing with chemicals).

Having all these supplies in one place is ideal. Designate a kit or drawer with two Morgan Lenses, two Medi-Ducts, one Delivery Set, solution bags, etc., so that in an emergency you can grab everything quickly.

Procedure

*(Perform these steps for **each eye injury case** requiring Morgan Lens irrigation. Recommendation is to treat both eyes.)*

1. Preparation and Patient Communication

- Verify Morgan Lens packaging is intact and sterile. The lens is single-use—dispose after irrigation per biohazard protocol. Only trained staff should handle and apply the device.
- Triage: Start irrigation immediately for chemical eye injuries. Do not delay; begin flushing unless contraindications exist. For foreign bodies, assess quickly—if irritation persists or debris cannot be removed easily, proceed to irrigation.
- Patient Communication: Explain: "We will irrigate both eyes with the Morgan Lens to remove chemicals, other foreign bodies and relieve pain. We will instill topical anesthetic drops first." Reassure the patient that The Morgan Lens floats on the solution; patient may close eyes once inserted.
- Anesthesia (if using): Instill 1–2 drops of topical anesthetic in each affected eye. If both eyes are exposed, treat both. Wait 10–20 seconds for effect before lens insertion.
- Topical anesthetic allergy: Morgan Lens insertion does not require numbing drops. In patients with a known severe allergy to topical anesthetics (e.g., proparacaine, tetracaine), avoid these agents. Allergic reactions are rare, and most patients tolerate standard drops.
- Positioning: Position the patient lying down (supine) or reclining at 45° with head supported. Use the Medi-Duct ocular fluid management system to absorb fluid outflow.

2. Equipment Setup

- Hand Hygiene and PPE: Ensure thorough hand hygiene and don gloves prior to procedure. Eye protection (goggles) is recommended when handling caustic substances to prevent accidental exposure.
- Assemble Administration Set and Morgan Lenses: Connect the Morgan Lens Delivery Set to solution of choice, spike the bag, and prime the tubing until fluid is visible from both branches of tubing. Attach one Morgan Lens to each branch of tubing.

- Check Flow: Start a minimal flow prior to insertion. For bilateral application: Unclamp the system to initiate a drip from both lenses, ensuring that the lenses are adequately wet for smoother insertion.
- Prepare Collection Materials: Prepare Medi-Duct adhesives by removing tape backing for immediate use and tape to the side of the patient's eye. Position a collection basin or trash receptacle at each side of the patient for solution runoff. Pre-tear tape strips for securing the Morgan Lens tubing to the patient's forehead.

3. Morgan Lens Insertion Process

4. Monitoring During Irrigation

- **Patient Comfort & Safety:** Use lactated Ringer's for irrigation—it's closer to eye pH and more comfortable than normal saline. Monitor pain; if discomfort increases, pause flow and add a drop of anesthetic at the inner corner without removing the lens. Repeat as needed every 10–15 minutes.
- **Systemic Support:** For severe pain, especially with alkali burns, give systemic analgesics per protocol.?? Topical anesthesia and irrigation usually reduce pain quickly.
- **Other Care:** Once inserted, use of the Morgan Lens keeps your hands free. Use this time to manage other injuries or prep meds, like antibiotics for post-irrigation.
- **Fluid Bag Changes:** Be prepared to swap out solution of choice quickly, so irrigation is continuous. When one liter is nearly empty, have the next ready spike with current administration set.
- **Eye Check:** After an initial period of irrigation, check the Ph of the eye and sensation of remaining foreign bodies. Complete a vision acuity test if necessary.

5. Irrigation Duration and Termination

- **Lens Removal:** Slow, but do not stop, solution flow. Ask patient to look up, gently pull-down lower lid, and slide lens out and away. Repeat for the other eye. Stop the flow of solution and dispose of lenses per biohazard protocols.

- **Stop Criteria:** Cease irrigation when pH is stable and neutral (7.0–7.3) for 10 minutes, or when irritant or debris is cleared and symptoms improve. If pH is not neutral, continue flushing until neutral. When in doubt, irrigate longer—dilution is the solution.

- **Post-Irrigation Exam:** Check corneal clarity (fluorescein if needed), clear fornices, assess visual acuity, and recheck pH after a few minutes. Resume irrigation until pH is neutral.

Additional Guidelines from Morgan Lens IFU Chart:

Morgan Lens Uses	Solution	Mode with Morgan Lens	Rate	Frequency
Acid burns or other ocular injury due to solvents, gasoline, detergents, etc.	Lactated Ringer's* Solution Recommended due to pH: LR 6.0 to 7.5 NS 4.5 to 7.0	Morgan Lens Delivery Set or I.V. set-up	500 ml rapid/free flow. Reassess and continue at slower rate.	Once. Repeat as necessary. Continuous until pH of cul-de-sac is returned to normal (approximately 7.0 to 7.3). Repeat as necessary.
Alkali burns		Morgan Lens Delivery Set or I.V. set-up	2000 ml rapid/free flow. Reassess. Continue at 50 ml/hour or 15 drops/minute.	
Non-embedded foreign bodies		Morgan Lens Delivery Set or I.V. set-up	500 ml rapid/free flow. Reassess and continue at slower rate.	Once. Repeat as necessary.
Foreign body sensation with no visible foreign body	20 cc sterile solution	20 cc syringe	Slowly without force.	Once. Repeat once if necessary.
Routine pre-operative	10 cc of preferred ocular antiseptic	10 cc syringe	Slowly without force.	Once.
Eyelid surgery (protecting the cornea during eyelid surgery)	Lactated Ringer's* Solution	Morgan Lens Delivery Set or I.V. set-up	4 drops/minute.	During entire procedure.
Severe infection	Lactated Ringer's* Solution with suitable antibiotic and steroid**	Morgan Lens Delivery Set or I.V. set-up	50 ml/hour or 15 drops/minute.	Continuous for 70 hours, then 10-hour intervals until marked improvement.

*MorTan recommends lactated Ringer's because its pH level of 6.0 to 7.5 is much closer to tears (approximately 7.1) than Normal Saline (4.5 to 7.0). Also, the lactate ion in lactated Ringer's exhibits a buffering capacity, returning the pH of either an acid or a base to neutral much more rapidly than a solution (such as saline) without any buffering capacity. **Use with antibiotics and steroids only when indicated.

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6. Documentation

- Record irrigation procedure: note initiation time, use of Morgan Lens, and whether irrigation was bilateral or unilateral. Example: *"Morgan Lens used within 5 minutes; bilateral eye irrigation with lactated Ringer's for 60 minutes."*
- Specify topical anesthetic: drug, concentration, drops per eye.
- State solution type and volume: e.g., "2 L lactated Ringer's (1 L/eye via administration set or Y-tubing)."
- Document ocular pH before/after: e.g., "Initial pH ~7 (OD), ~1 (OS); post-irrigation pH 7.4 (OU)."
- Explain bilateral treatment if both eyes irrigated: e.g., "Both eyes treated due to chemical splatter risk."
- Note disposition: Set follow-up plan, transfer/discharge, and provision of written precautions.
- Include incident reporting for work-related injuries or chemical products as needed.
- Coding for proper billing of insurance.

Finally, ensure the **equipment is disposed/cleaned and restocked**: throw away used Morgan lenses, administration set and Medi-Ducts, clean any soiled linens, and prepare the drawer or kit for the next use (replace the used products with new ones from stock, etc.). This guarantees that the Emergency Department or Urgent Care Clinic is ready for the next eye emergency.

Conclusion

Using this protocol to train medical staff not only master the steps of eye irrigation with the Morgan Lens but also grasp the importance of bilateral irrigation in many scenarios. **Clinical evidence clearly shows that treating both eyes is essential** in chemical, particulate and heat injuries. Often times, patients and providers can miss the involvement of the second eye. With this approach, medical staff will quickly start irrigating both eyes as needed, which can greatly enhance patient outcomes. Immediate, thorough irrigation—with **two lenses for two eyes**—has been proven to reduce ocular surface damage and promote healing after chemical burns. This method avoids the risk of leaving a "quiet" second eye untreated, which could later develop severe issues. In short, treating both eyes when unsure is a straightforward step that preserves vision: **flush both eyes** if there's any doubt.

Equipping staff with comprehensive knowledge and a structured procedure—including indications, contraindications, proper setup, and documentation—enables emergency departments and urgent care centers to manage eye emergencies with confidence, matching the standards of an emergency department. The Morgan Lens, properly applied, is widely used (in 90% of U.S. ED's) and provides effective irrigation while allowing providers to attend to other tasks. Stressing bilateral irrigation maximizes its benefits, safeguarding *all* the patient's vision.