Ophthalmology
On-Call
Survival Guide
Introduction

No doubt about it, starting a residency is very difficult. As a new first-year resident, the recurrent theme seems to be "I wish I had known this sooner" or "I wish someone had told me that." This guide is designed to do just that. It is to be a quick stop for information. We intend for it to be as concise and practical as possible. References are provided when appropriate. Obviously, it is not complete by any stretch of imagination, and you will definitely need to consult the abundant reference materials available in our great C.S. O'Brien Library. This is designed to be a foundation on which we hope you will build. We review the manual on a yearly basis in order to make it as up-to-date as possible. As you go through the year please, think about additions or deletions that may be appropriate and suggest these changes for future editions.

Two key things to remember when you’re starting call:

1) Don’t blind anyone – if you are ever unsure what to do ("Should I go in or not?") err on the side caution. Just see the patient.

2) You’re never alone – there’s always back-up available. Every senior resident has at one time been a first-year.

Welcome to Iowa! As you will soon find out, this is a great department with a profound and far-reaching legacy of ground-breaking research and excellent patient care. You are now a part of that family – and we’re happy to have you!

Iowa City, July 2016
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UIHC Layout

The Buildings of the Hospital are in alphabetical order (by last name) from North to South.

Boyd Tower (BT) - aka General Hospital     Elevators A, B, C
Roy Carver (RC)     Elevators D, E
John Colloton (JC)     Elevators F, G, H
John Pappajohn (JP)     Elevators I, J
Pomerantz Family Pavilion (PFP)     Elevators K, L, M

The wards are named by floor number, then building, then often as West or East. When you get off the elevator and start walking down one of the wards, the first nurses' station you come to will be the "West" nurses' station, and if you keep going you will come to the "East" nurses' station.

The key to knowing where you are is the elevators. They are in alphabetical order, starting with Elevator A in Boyd Tower down to Elevator M in Pomerantz Family Pavilion.

<table>
<thead>
<tr>
<th>Floor</th>
<th>Elevator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burn Unit</td>
<td>8 JC</td>
</tr>
<tr>
<td>Call Room – Ophtho</td>
<td>7 JC</td>
</tr>
<tr>
<td>CT Scanner</td>
<td>3 JC</td>
</tr>
<tr>
<td>CVICU</td>
<td>4 JC</td>
</tr>
<tr>
<td>East Room</td>
<td>8 JC</td>
</tr>
<tr>
<td>ER</td>
<td>1 RC</td>
</tr>
<tr>
<td>Main OR</td>
<td>5 JC/JP</td>
</tr>
<tr>
<td>Med Psych</td>
<td>3 BT</td>
</tr>
<tr>
<td>Microbiology</td>
<td>6 BT</td>
</tr>
<tr>
<td>MICU</td>
<td>5 RC</td>
</tr>
<tr>
<td>MRI/Reading Room</td>
<td>Lower Level</td>
</tr>
<tr>
<td>Neuro/Neuro-surg</td>
<td>6JCW</td>
</tr>
<tr>
<td>NICU</td>
<td>6 JP</td>
</tr>
<tr>
<td>Ocular Path</td>
<td>2 MRC</td>
</tr>
<tr>
<td>Ophtho Inpatient</td>
<td>3 RC</td>
</tr>
<tr>
<td>Peds Eye Inpatient</td>
<td>2 or 3 JCW</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>2 PFP</td>
</tr>
<tr>
<td>Pharmacy,</td>
<td>1 RC</td>
</tr>
<tr>
<td>PICU</td>
<td>7 JP</td>
</tr>
<tr>
<td>Radiology Reading</td>
<td>3 JC</td>
</tr>
<tr>
<td>SICU</td>
<td>5 JP</td>
</tr>
<tr>
<td>Specimen Control</td>
<td>6 RC</td>
</tr>
<tr>
<td>Main Cafeteria</td>
<td>1 Gen</td>
</tr>
</tbody>
</table>

On-call room: 7404 JCP
On-Call tips: When seeing a patient

- Dilate everyone (unless medically contra-indicated, ie neuro monitoring)
- Offer to see every patient who calls. Even if you don't think the situation is emergent, it's still wise to let patient decide not to come in right away.
- Never hesitate to call for help.
- Although there are many things we'd rather do than be stuck on-call, it an amazing opportunity to learn.
- Above all, help your fellow residents out whenever you can. Remember, we are in this together.

I. Telephone calls from patients

A. Name and MRN should be provided by the call center

B. Often easiest to pull the patient up in the computer to skim their last note before taking the call, also it is best to document while they are talking to you
   1. In general best to document all phone calls, necessary for all patient who are not presenting to clinic
   2. In the case you are in the middle of another patient encounter it is ok to ask the operator to tell the patient you are with another patient and that you will call them back shortly, the operator can then page you the call back number

C. Identify
   1. Chief complaint
   2. Pertinent ocular symptoms
      a. Visual change
      b. Pain
      c. Redness
      d. Onset and duration
      e. Discharge

D. General Rule: If in doubt, bring the patient in.
   1. Good idea to offer to see all patients
   2. "It is difficult to assess your problem without examining you. I would be happy to see you as soon as you can get here."
   3. Obtain a call back number – ask for cell phone if possible
      a. Can discuss with senior or fellow if necessary and call back
      b. Can contact patient in transit or if you think they should have arrived but are lost in the hospital
   4. Set a time for arrival/appointment. If urgent tell them to come immediately and not to eat or drink if symptoms suggest a possible retinal detachment/globe injury/need for emergent surgery.
   5. Established patients may come directly to the eye clinic; patients new to UIHC go to the ED first.
      a. Tell the patient that the eye clinic will be locked and that they will need to use the phone at the door to call the operator and ask for the eye doctor on call.
      b. Easiest to direct them to ramp 4 then second floor sky walk where there is a phone upon entering
II. Telephone calls from outside physicians (ED physicians, ophthalmologists or optometrists)

A. Where to see the patient
1. Unless they are an established eye clinic patient it is best to see the patient in the ED, especially if there are additional injuries or concerns beyond the eyes
2. Always have an MRN created even if there is a chance patient will not transfer, this allows for documentation RE conversation with outside provider. In the case that the patient is coming this note allows ED/other care teams to know you are aware of the patient upon their arrival
3. Transfer patient to UIHC through the ER.
   a. If it is another ED ask call center (often stay on the line) for assistance of ATC (admission and transfer center) in facilitating ED to ED communication and patient transfer. They can decide if best by ambulance vs private car, noted an time of arrival etc
   b. if it is an outside eye care provider have them advise patient to present to the ED and then you can call the ER charge (6-2233 ask for charge nurse) and inform them that the patient is coming, ask them to page you when the patient arrives

B. Obtain referral information
1. Physician name and phone number
2. Referring physician should be kept informed (dictated letter +/- phone call)
3. Request medical records (ie imaging in fractures)

III. Seeing patients on call in the clinic (“Eye After Hours”)

A. In order to document on these patients in EPIC, an encounter must be created by calling the ER at 356-2233. You will need to tell the ER the patient’s name, MRN, faculty on call/fellow to staff, and type of encounter – “eye clinic.”
B. Make sure patient is stable – take immediately to ER if unstable
C. If situation is urgent and you need to dilate—check Va, Ta, pupils for RAPD, SLE for iris neovascularization, narrow angles first and then dilate before completing the history.
D. See the patient and form an assessment and plan before calling the senior resident
   1. Do your best – tough at first!!
   2. Don't be afraid to call. If any questions, check with your back-up.
   3. Early in the year, always run patients by the senior resident – later you will be able to manage more on your own. All patients going to the OR must being admitted and need to be seen by the senior resident.
E. If things seem emergent or there has been a dramatic change in visual acuity – call the senior resident right away before dilation. They may want to come in to verify an RAPD early in the year.

**most often the patients below (F/G) will present to ED where it is much easier to facilitate imaging, admission, Td, etc…if they are in clinic first it is reasonable to call 6-2233 and arrange for transfer (walk the patient down there) and completion of exam/work-up in the emergency room**
F. If a patient appears surgical (i.e. open globe, canalicular laceration, lid margin laceration)
   1. Call back-up early
   2. Last meal?? - keep NPO
   3. Tetanus
   4. History and physical
   5. Consent form
   6. Call anesthesia for pre-op evaluation (131-3911)
   7. Call OR for available time (3-6400)
   8. Call bed placement (4-5000)

G. CT/MRI/X-ray: For patients being seen in clinic
   1. Page the radiology resident on-call to ensure the proper protocol is being ordered
   2. Put the orders in EPIC.
   3. If giving contrast check BUN/Creatinine
   4. Transport the patient to radiology

H. Documentation (done under telephone encounter)
   1. Enter a clinic note just as you would in general clinic using the ophthalmology exam and clinic note template.
   2. Clinic notes will need to be co-signed. This will generally be directed to the faculty on-call unless you have spoken to a fellow who is aware of this patient (see staffing below)

IV. Seeing patients on the floor or in the ER
   *Hint – To view the ER grease board, log in as ED instead of Ophthalmology LIP, but always document as an Ophthalmology LIP.

   A. Think about what you may need for your exam
   B. Stock the call bag for your journey – **You should re-stock the call bag after each call and recharge instruments that need it** (IOL calc room). Place used instruments in the appropriate area in the nurses’ station.
      1. Essentials: acuity card, indirect, Finhoff, tonopen (+covers), drops (fluorescein, proparacaine, tropicamide, phenylephrine), near card (w/+3.00 and +1.75 lenses), portable slit lamp
      2. other supplies as indicated by consult – ie demar retractors in trauma patients.
   C. Essential parts of your exam:
      1. Check for RAPD
      2. Visual acuity in each eye – eye chart or near with appropriate add (loose lenses in call bag)
      3. Motility and CVF
      4. View of optic nerve and posterior pole – ASK if the patient can be dilated!
5. Ocular exam – specific to trauma
   a. sub-conj heme –360 SCH and you cannot see sclera be cautious of occult open globe
   b. hyphema/hypopyon
   c. iridodialysis, traumatic mydriasis
   d. pigmented tissue visible anywhere
   e. periorbital ecchymosis/edema (need for canthotomy/cantholysis!)
   f. infraorbital paresthesia
   g. orbital rim step-offs
   h. lacerations
   i. subcutaneous emphysema
   j. telecanthus or rounding of medial canthus (medial wall fracture)
   k. facial asymmetry
   l. forced ductions if limited motility
   m. if suspicious of an open globe, do not check IOP

6. Find out what ENT, G-Surg, Neuro Surg, Ortho, etc. plan to do with a multiple trauma patient to coordinate services and plan OR time if necessary.

7. Review CT scans – call page radiology to review (or go visit in ED reading room)

8. If the patient looks surgical and other services are moving fast, let the senior know right away. Otherwise, do the above prior to calling the back-up.

D. Documentation/Orders

1. Patients should have an official consult entered into EPIC, this can be linked to the note once it is started

2. Notes should be started under the “notes” tab and “consult” should be entered in the drop down asking for type

3. Choose “Eye Kaleidoscope Note” from the text list

4. Inpatient consults need to be co-signed using the same guidelines for clinic patients. See the staffing section below for more information. It is a rule of thumb to discuss or email the senior resident about all inpatient consults since faculty will need to be made aware of the consult. (Anytime you need to talk to faculty, the senior should be aware of the patient first.)

5. ED consults are often co-signed to the ED attending unless the patient is to be seen by a fellow or faculty (ie going to the OR for a globe or lid lac repaired with plastics fellow)

6. Generally the ER/inpatient resident will do all of visit and discharge orders—you just need to let them know your recommendations
   a. In ED if you do want to place and order (ie corneal culture or OR order sets) they are done through current visit rounding orders
   b. In ED if you want to write for meds upon discharge (ie fortified eye drops) this is done through discharge order reconciliation
V. Miscellaneous

A. Diurnal pressure checks
   1. Glaucoma tech will notify you of diurnal curve patients
   2. You are responsible for 7PM, 10PM, and 7AM IOP checks
   3. Communicate with your patient at the 7 PM check
      a. Where to meet – usually call from front door
      b. "I'm on call and may be tied up, but will try to be as punctual as possible"
      c. if you anticipate an excessive wait, call your back up

B. S/P vitrectomy patients
   1. Retina fellow may call for IOP check although usually job of resident on retina service
   2. Never take lightly a retina patient complaining of head or eye pain! (May indicate endophthalmitis)

C. Retinal detachments, retinal holes, etc.
   1. Call retina fellow pager directly for evaluation of definite RD referrals after working it up. If unclear of what you’re seeing, call your senior first prior to fellow. Remember: the B-scan is your friend!

On-Call tips: Staffing and Follow up

A. Staffing

Staffing can be a difficult and frustrating part of call. You will find some faculty prefers to staff most inpatient consults while most prefer to simply sign off on your notes. In general our more junior faculty want to be more hands-on with on call issues and our more senior faculty prefer to not. If there are any questions about an individual faculty preference, ask your senior.

Officially, all inpatient consults are supposed to be staffed by a fellow or attending within 24 hours. Unofficially, there are three types of consult patients.

1. Complicated – Complicated patients should be discussed or seen by the senior resident. It is our policy that faculty only be contacted by the senior resident. In these patients, the senior residents will usually contact the faculty that night and discuss staffing. Sometimes, staffing can occur the next day in the faculty’s clinic. It is permissible for the first year resident to contact a fellow directly regarding the staffing of complicated patients if the first year resident has become proficient in the examination of that particular type of patient. Otherwise, they should be discussed or seen by the senior resident first.
   *includes all positive non accidental trauma w/u and any patient requiring the OR

2. Uncomplicated – Uncomplicated patients can often be discussed with the senior resident over the phone. If the senior resident feels staffing can wait for 24 hours, an e-mail can be sent to the on call faculty asking if they would like to staff these patients or if they would prefer to just sign off on the note. On some services, it is standard practice to e-mail the fellow (such as the case of an uncomplicated orbital fracture) in order to ask them about staffing.

3. Really Uncomplicated – On rare occasion, you will be asked to see a post-op corneal abrasion or something like a subconjunctival hemorrhage in a patient recently intubated on Coumadin. In these cases, it is often unnecessary for these patients to be staffed and also unfair for the patient to be billed for these consults.
If this is the case, it is permissible to ask the consulting service not to order an official consult and to document a short note into EPIC.

B. Follow-up

After receiving permission from a fellow or attending to schedule a follow up in their clinic place a “Follow Up Eye” order with attending name and date/time frame for return. The bad thing is that they may not get this order until later in the morning so I would avoid this option if a patient needs to be scheduled for an appointment the same day – instead a phone call or trip to the scheduling desk is best.

Inpatient follow-up can be easily documented by creating a new progress note. This does not have to be co-signed. You are responsible for follow-up on inpatients in these cases:

- The inpatient did not require subspecialty care but have eye issues that need follow-up – (ie corneal abrasion)

- The patient was unable to be dilated at the time of the initial consultation. In this case you need to contact the primary service to see when they can be dilated, then perform the DFE and document your findings as a progress note in EPIC.

- The patient was seen by a subspecialty service by they requested you follow-up on issues.

No-man's land (consults you are called with between 7:30AM and 8AM)

This is an issue that is a source of frustration for us all, as we all have clinical duties to report to, and the issue of whom your third year is and who the attending on call is sometimes become hazy when consultations are begun around 8AM. There is no official policy around these consults. Suggestions are as follows:

1. You should evaluate the patient if you think that this can be reasonably accomplished prior to the beginning of clinic at 8:45 AM. Try to be efficient and get this done so it doesn’t get left for your colleagues. If there is no way you will be able to see the patient and finish your evaluation the consult should get passed off to the day consult service for inpatients, or to the general clinic resident if the patient is in the ED or can come to clinic.

2. The day inpatient consult service will only see patients after 1PM. If there is any question of an inpatient with a possible true ophthalmic emergency that you are called with in the AM, you should definitely see the patient regardless of your pending clinical duties (advise your clinic attending of the situation though!), or ask your third year what to do if you have obligations you cannot miss.
**On-Call tips: Parking**

On weeknights, try to get your car from Finkbine or Arena lot early. It is best to head straight out as soon as you can after clinic (5:00 pm) if you do not have conference or patients already coming. The last shuttle is 12:15 am. If your car is still at Finkbine or Arena lot then, you will have to walk there or call Hospital Security for a personal ride (6-2658). There is a van that can be caught at Main Entrance (elevator D) that makes trips to all parking lots throughout the evening and late night.

You can park in Parking Ramp IV (connected to Pomerantz) from 4:30 pm to 7:30 am weekdays and all day on weekends for free if you display your Finkbine card. Just write your name and card number (e.g. 1077) on your ramp ticket. If you don't have a Finkbine placard, but have parked in one of the ramps while on call, you can write the following on the back of your parking slip: the words ‘Call Back’, Your Name, Your signature. This is called the “Call Back program”. If you have any problems with the staff in the parking ramp questioning this, you can direct them to the following number: 5-8312 (parking dispatch, which is open 24-7). If you do this, you will not be charged. But if you are unlucky enough to have an early morning call patient that runs into the next clinic day, you will have to move your car or pay the regular rate after 8:00 am (~$17/day).

Additionally, you can park across the street from the hospital (next to Kinnick Stadium – Lot 43) from 4:30pm to 7:30am on weekdays and all day on weekends (except Football game days) for free (without having a Finkbine pass).

If you have a quick in and out after business hours you can try to park under the glass awning (valet area) out front, but residents have occasionally been ticketed for parking there if they stayed long enough. Also, it is best to tell the patients who are coming in to park in the ramp (they will be charged). They can park under the awning out front at their own risk.
Corneal Drawing

Less used now that we are with EPIC, but good to know!
A. Color code used in clinical corneal drawings (see color guide in cornea exam rooms)

B. Basic Outline: Left, frontal view:
   1. Draw a circle about 30 mm in diameter to represent the corneal limbus (black).
   2. Add pupil as a landmark (brown).
   3. Indicate location of cross-section by a line through frontal view (black). Right, slit view:
   4. Draw a freehand cross-section outline to show variations in corneal thickness (black)

C. Pattern of corneal pathology.
   Left, frontal view:
   5. Use sclerotic scatter and broad tangential illumination to outline all opacities (blue).
   Right, slit view:
   6. Add a line to indicate epithelium (black), leaving defects where ulcers are apparent.

D. Details of corneal pathology.
   Left, frontal view:
   7. Refine opacities into scar (black), degeneration (black), infiltrate (orange), and edema (blue).
   8. Add labels if helpful.
   Right, slit view:
   9. Draw opacities in epithelium, stroma, and Descemet's membrane at appropriate level.
   10. Add labels if helpful.

E. Other corneal findings.
   Left, frontal view:
   11. Add vessels (red), pigment (brown), and posterior deposits (orange, brown).
   Right, slit view:
   12. Add vessels (red), pigment (brown), and posterior deposits (orange, brown)

F. Anterior chamber and lens.
   Left, frontal view:
   13. Add abnormalities of anterior chamber (hypopyon, orange), iris (anterior and posterior synechiae, brown), and lens (posterior subcapsular cataract, green).
      *Omit those that clutter the drawing.*
   Right, slit view:
   14. Show the relation between abnormalities of anterior chamber, iris, and lens.

G. Vital stain
   Left, frontal view: Take photographs before vital staining (if desired).
   15. Sketch in stain with fluorescein (green) or rose bengal (red). Make a separate sketch of needed.
   16. Measure lesions with continuously variable slit height or reticle from an identifiable limbal landmark.
   Right, slit view:
   17. Add staining with fluorescein (green) or rose bengal (red. HSV. Herpes Simplex Virus.
### Symptoms as a Clue to Cause of a Red Eye

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Possible Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Itching</td>
<td>Allergic conjunctivitis</td>
</tr>
<tr>
<td>Scratchy Sensation</td>
<td>Dry eyes, foreign body in the eye, blepharitis</td>
</tr>
<tr>
<td>Burning</td>
<td>Lid, conjunctival or corneal disorders</td>
</tr>
<tr>
<td>Localized lump or</td>
<td>Hordeolum, chalazion</td>
</tr>
<tr>
<td>tenderness</td>
<td></td>
</tr>
<tr>
<td>Ocular Pain</td>
<td>Iritis, keratopathy, glaucoma, scleritis, infection, orbital cellulitis, corneal</td>
</tr>
<tr>
<td></td>
<td>abrasions, myositis, optic neuritis</td>
</tr>
<tr>
<td>Photophobia</td>
<td>Iritis, keratopathy, glaucoma, corneal abrasions</td>
</tr>
<tr>
<td>Mucoid discharge</td>
<td>Allergic conjunctivitis, chlamydial infection</td>
</tr>
<tr>
<td>Watery discharge</td>
<td>Viral conjunctivitis, chemical irritants</td>
</tr>
<tr>
<td>Purulent discharge</td>
<td>Bacterial conjunctivitis, corneal ulcer, orbital cellulitis</td>
</tr>
</tbody>
</table>

Superficial Keratitis - Differential Diagnosis Based on Distribution

- Staphylococcus
- Exposure
- Entropion
- Ectropion

- EKC
- SPK
- IC
- Overwear of contact lens

- Trachoma, IC
- SLK
- Vernal
- Molluscum

- K Sicca
- Neurotrophic exposure
- Ultraviolet

- Acute conjunctivitis Medicamentosa

- Spray keratitis
- Trichiasis
- FB
**Corneal Abrasion/ Foreign Body**

**History:** Mechanism of injury/ Tetanus status

**Exam:** Va/ IOP/ Slit lamp/ Evert eyelids/ Inspect fornices/ measure dimension of lesion/ DFE

**Ancillary Studies:** If there is a potential of intraocular foreign body, think about Echo or CT scan (1.5 mm fine cuts-0.006 mm3 metallic FB, 1.5 mm3 glass, may miss organic/wood)

**Signs and Symptoms:** Decreased Va; Photophobia; Cell & Flare; Corneal edema/ infiltration

**Management:** Topical anesthetic will make life easy for everybody. Use lid speculum if necessary.

**Abrasions:**

- **Dirty** (i.e. CL induced or from a tree branch (organic matter), etc.) No patching!
  - If there is infiltrate, treat as corneal ulcer
    - If there is no infiltrate, moxifloxacin or gatifloxacin QID at minimum, if bad Q1 hour
    - Consider cycloplegic (will aid in pain control)
    - Monitor daily until there is complete resolution.
  - **Consider steroid if lesion is in visual axis only after the infection is adequately treated (rarely starting steroid on call!!)

- **Clean**
  - Be very cautious with using bandage contact lens, unless you want to be accountable don’t risk it
  - Antibiotic coverage (usually as above Qday minimum) vs erythromycin ointment TID
  - Consider hypertonic NaCl drops or ointment for persistent or recurrent erosions

**Foreign Body:**

- **Irrigation:** May want to try this first.

- **Bent Needle:** Under low to medium magnification, stabilize your hand and hold the needle parallel to corneal surface as bevel faces the practitioner.

- **Rust ring:** Complete removal of a rust ring is not necessary and doing so may damage additional tissue.
  - As cells repopulate, the rust ring will move anteriorly and resolve.

- **Post procedure Care:**
  - Antibiotic (fluoroquinolone qid to 6x/day)
  - +/- cycloplegia
  - No patching
  - Follow-up in 1-2 days (most epithelial defects heal in 24-48 hours)

**Patients Instructions:** Signs and Symptoms of infection; discussion of safety goggles
**Corneal Ulcer**

**History:** Trauma, previous corneal abnormalities, CL wear (type of lens, solutions, wear time including sleeping) hot tub/lake exposure, previous corneal ulcer, nasal/oral/genital ulcerations, systemic diseases.

**Exam:**
- Check corneal sensation (decreased sensation can suggest herpetic keratitis).
- Measure the size and extent of the ulcer (stromal loss with an overlying epithelial defect)

**Management:** Infection is assumed to be bacterial until proven otherwise.

**Criteria to note in order to evaluate the response to therapy:**
1. Margin of infiltrate
2. Density
3. Hypopyon
4. Discharge
5. Symptoms: pain, etc.
6. Epithelial defect

**Indication for Steroid:**
*rule of thumb – add after 48 hrs of appropriate tx for gm pos, 72 hrs for gm neg-again RARE to be doing this step on call*
1. To reduce inflammation after adequate coverage
2. Reduction of scar formation especially at or near visual axis
3. Tectonic changes: marginal thinning, etc.

**Treatment:**
1. Cycloplegic
2. Topical antibiotic
   - **Low risk of visual loss** <1mm, non-staining peripheral infiltrate, minimal AC rxn and discharge
     - Non CL: Fluoroquinolone QID -6x/day
     - CL: Fluoroquinolone Q2 hours-QID
   - **Borderline risk** 1-1.5 mm diameter peripheral infiltrate, or any smaller infiltrate with epi defect, mild AC rxn, and moderate discharge
     - Fluoroquinolone q1hr around the clock
   - **Vision threatening**
     - Large, >1.5mm diameter ulcer, or any infiltrate with moderate to severe AC rxn, purulent discharge, or involving the visual axis
       - Fortified **tobramycin** or gentamicin (15 mg/ml) q1hr alternating with fortified cefazolin (50 mg/ml) or **vancomycin** (25 mg/ml) q1hr (*Bold used most commonly*)
       - Or fluoroquinolone gtt q 5min x 3 doses, then q15min for 2-6 hrs, then q30min around the clock
       - Atypical mycobacterial: amikacin (10 mg/ml) gtt q2hr for 1 week then qid for 2 months
3. In follow up treatment is adjusted according to the culture/ sensitivity results. Abx gradually tapered as ulcer improves per cornea service (vs if no improvement re-culture vs confocal etc)
If patient has a positive fungal corneal culture:

*It is common to get call from micro-lab over the weekend RE culture results

1. Make sure patient is on topical anti-fungal
   a. topical voriconazole 1% q2h while awake x 1 week, then qid
   b. amphotericin 0.15% as 2nd line (qid if donor rim culture positive, q1h if corneal culture is positive)

2. Make sure patient is on oral antifungal:
   a. voriconazole 200 mg bid
   b. fluconazole 200 mg bid as 2nd line

3. For EK (DSAEK/DMEK) patient: Follow-up with Cornea in 1 week for intracameral voriconazole

4. Email attending and fellow to inform them of the culture result

Atypical treatment regimens

**Fungal:**

Natamycin (50mg/ml) gtt q1-2hr WA, q2hr at night
Amphotericin B (1.5mg/ml) gtt q1hr (good for Candida)
Itraconazole po 400mg loading dose then 200 mg qd
Miconazole or clotrimazole (1-10mg/ml) gtt q1hr (for Aspergillus)

**Acanthamoeba:**

Cholorohexidine (CHX) 0.02% gtt q 1hr
Polyhexamethyl biguanide (PHMB) 0.02% gtt q 1hr
Itraconazole 400mg po x 1, then 200 mg po qd

**Herpes Simplex Virus:**

Acyclovir 400 mg PO 5x/day or Valtrex 500 mg PO TID for 21 days
Less preferred: Trifluorotymidine (Viroptic) 1% 9 times/day or Vidarabine (Vira-A) ung 5 times/day (can be very toxic to the epithelium)

**Herpes Zoster Virus:** acyclovir 800 mg PO 5x/day; famciclovir 500 mg tid; or valcyclovir 1000 mg PO tid for 7 to 10 days. If severe acyclovir 5-10 mg/kg IV q8h for 5-10 days

How to Culture a Corneal Ulcer

**When to culture:**

- Infiltrate >1-2mm with an epithelial defect
- Central or paracentral ulcers
- Significant tissue loss
- Presence of hypopyon
- Unusual organisms suspected by history or examination
- Lack of response to empiric therapy
- Postoperative eye

**What you’ll need & where you’ll find it:**

- Please refer to EyeRounds.org “How to a Corneal Culture” video tutorial by Dr. Watts.
  http://eyerounds.org/video/Cornea-Culture.htm
• In Cornea Clinic, the first workroom (by front desk) has a small fridge in which you’ll find:
  o Blood agar (for aerobic bacteria)
  o Chocolate agar (for Hemophilus and N. Gonorrhea)
  o Thioglycolate broth – short tube of broth (for anaerobic bacteria)
  o Tryptone Soy Broth (TSB) – tall tube of broth (for aerobic bacteria)
  o Potato dextrose – white slant tube (fungus)
  o Lowenstein-Jensen (aka. 7H11) – green slant tube (mycobacterium)
  o HSV tubes (one little eppendorf tube (empty tube with blue top) for tear strips
  o Glass slides in slide folder
  o Specimen bag – nice way to carry the supplies to the ED
• From the supply cart, collect:
  o Jeweler’s forceps for HSV tear strip collection
• In any of the cornea exam rooms, you’ll find:
  o Topical anesthetic – should be in call gab
  o Calcium alginate swabs
  o Tear strips

Set Up:
1. Gather all the supplies listed above
2. Print patient labels (this is done through EPIC and can be printed after hours at the computer in the Nurses’ Station or cornea clinic).
   ** to print labels: click on the “Epic” button in the top corner of the screen, choose “Patient Care”, and then “Patient Labels”.
   ** alternatively if done in the ED this is all done by the nurses there making it a much easier process
3. Tape a label onto the agar plates, tubes, glass slide folder and specimen bag

Procedure
(see http://eyerounds.org/video/Cornea-Culture.htm tutorial by Dr. Chris Watts for more details)
*Easiest to lay tubes out in the order listed below and then recruit a helper (nurse/med student/family member)

• Apply topical anesthesia
• For each sample (other than HSV) saturate swab with TSB prior to scraping
  o Each scraping should be used to inoculate only one medium
  o None of these swabs are broken off in the media. Just swirl them around their respective tubes or streak on media.
• First collect the samples for HSV
  o Hold tear strip with Jewelers and obtain a sample of patient’s tear film. Try not to touch the eyelid/conj/cornea. Does not have to soak the strip -> a little bit will do. These should be placed in the empty eppendorf tube (without media)
  o Use cotton swab to sample ulcer, stir around in pink media, do not break swab in media.
• Next, inoculate the blood and chocolate agar plates
  o Streak the surface to produce a row of separate inoculation marks ("C’s")
  o Do not penetrate the agar
• Then, smear two slides for gram stain
• Inoculate the 2 slant tubes
• Finally, inoculate the 2 broth cultures
  o Transfer the sample from the swab into the broth by pushing the swab to the bottom of the tube

If Concerned about Acanthamoeba
*if this concerned should have senior or fellow there
• Confocal prior to culture (debate if this needs to be done on-call)
• In addition to above mentioned culture, perform epithelial scraping and place the scraping in small tube with Saccomano fixative
  o Saccomano fixative is a green liquid above the sink in the confocal room
  o Small tubes are above the sink too.
  o These get sent to PATHOLOGY, not micro. After hours – leave in specimen pick-up.

Off to the Lab
*in ED they do everything except place the SmartSet order
• Complete EPIC orders (in SmartSet box type: “Corneal Ulcer”) and print out labels (stickers) of the order requisite. The requisite sticker should be placed with the specimens in a biohazard bag. These labels can only be printed from the cornea workroom, nurse’s station, or ER.
  o To print labels from EPIC after they have been ordered, click ‘SnapShot’ button on the left menu
  o At the top of ‘SnapShot’, search for the report called ‘Specimen Collection’ window (wrench this into your toolbar so it is easy to find next time, by clicking on the wrench next to search window)
  o Click the blue “print labels” link, by each order that appears in this window. Make sure the correct label printer is connected
  o After the stickers have been printed, click blue “collect specimen” by each order
• For HSV culture and PCR. Complete EPIC orders. A separate lab printout (outside lab) will print on paper. The culture and PCR will go in separate bags. They will eventually be sent to the hygienic lab through our micro lab.
• After hours you need to bring the specimen to microbiology 6BT at elevator A. It is a good idea to walk this to the lab. Do not tube specimens, as they tend to break in transit.
Chemical Injury

Initial Therapy:
- Irrigation x 15-30 minutes using Morgan lens or until pH is normal.
  - Hint: compare pH paper result with control (your own tears), may require several liters
  - Outcome related to duration of contact between the chemical (Alkali > acidic) and eye.
- May need to sweep fornices to clean debris
- Debridement of necrotic corneal/conj epithelium to allow proper re-epithelialization
  - Do not do this on your own – another case when your senior should be present

Exam - Check for epi defect, IOP, VA, perilimbal ischemia (lack of conjunctival vessels)
**Amount of therapy dictated by degree of limbal ischemia – a judgment call**

Medical Therapy - Wagoner’s alkaline chemical injury protocol:
Acute phase:

TOPICAL RX
- Corticosteroids Q1-4H
- Medroxyprogesterone Q2H (compounded by pharmacy)
- Ascorbic acid Q2-4H (compounded by pharmacy)
- Sodium citrate Q2-4H (compounded by pharmacy)
- Prophylactic antibiotics
- Cycloplegia
- IOP control
- Ointment for lubrication (Refresh PM, erythromycin)

SYSTEMIC RX
- Doxycycline 100mg BID
- Sodium ascorbate 2 grams BID

BANDAGE CONTACT LENS for large epithelial defect if patient admitted and/or likely to follow-up in clinic.
**Trauma**

**OPEN GLOBE**
- First, confirm the globe is open—often reported to be an open globe on the outside but is not!
- Do not check IOP if there is concern for an open globe
- Call senior after confirmation of open globe or if there is any question
- Things to be done while waiting for senior
  - 400mg IV moxifloxacin or equivalent (ceftazolin)
  - IV zofran if there is any nausea (want to prevent valsalva)
  - Fox shield – no pressure on globe (in room 9)
  - Ask about last meal (make NPO), last tetanus shot (have ED update if needed)
  - Fill out consent, H&P, mark patient
  - Can call main OR if senior requests: 3-6400 (schedule as class B priority)
  - Page anesthesia (3911) – all cases will be general anesthesia
  - Have ED facilitate call to bed board for admission
  - Admission orders (smart set – EYE:ADMIT TO OPHTALMOLOGY INPATIENT)
  - OR procedure orders (if requested by senior) - eye trauma order set, general anesthesia, no retrobulbar

**EYELID LACERATIONS**

**Step 0: Come Prepared**
1. Suture (5-0 fast absorbing gut for most skin closure, 5-0 and 7-0 Vicryl for margin-involving lid lac, 4-0 Vicryl on a P-3 needle for deep closure outside the lid where septum is not present, rarely 6-0 Prolene for eyelid skin closure, 5-0 Prolene for brow and forehead skin closure)
2. General surgery plastics tray from nurse's station (this contains your locking needle driver, Paufique forceps, suture scissors, etc. and MUST be returned to our nurse's station when you're finished)
3. 2% lidocaine with 1:100,000 epinephrine (can combine with 0.5% bupivacaine in a 1:1 mixture for longer anesthesia) – should be in call bag, if not get from nurses station
4. 3 or 5 cc syringe depending on how much local you will need
5. 20G needle to draw up the lido, 27G or 30G to inject it (I prefer the 27G 1 1/4 needle, but these are hard to find in the minor rooms)
6. Punctal dilator, Bowman probes (size 00 or 0) and 23G curved lacrimal cannula on a 3 cc syringe filled with fluorescein-infused sterile saline if you fear canalicular involvement (all in our nurse's station)
7. Topical 0.5% proparacaine (numb the eye in case betadine gets in it)
8. Betadine swabs
9. Sterile saline to irrigate and clean the wound (available in the ETC)
10. Sterile gloves – for you and your senior (also available in the ETC)
11. Sterile plastic adhesive drapes (the eye drapes in the minor room have a circular opening that can be centered on your operative site)
12. Sterile gauze and Qtips (conveniently packaged together in our nurse's station)
13. Sterile pads or towels to expand your sterile field
14. Erythromycin ophthalmic ointment (order from the ED for “now” and nurses will provide it)

**Step 1: ALWAYS clear the globe**
Step 2: History
- Patient age
- Mechanism of Injury:
  - What was the object that inflicted the injury?
    - Dog bites: recommend dog be put down (the second bite is always worse than the first) and give antibiotics covering mixed flora (e.g. Streptococcal spp., Anaerobes, Pasteurella, and Gram Negative Rods)
      - Ampicillin/Sulbactam (Unasyn®): 1.5-3gm IV q6h [adults], 150-300mg/kg/d IV divided q6h [pediatrics]
      - Amoxicillin/Clavulanate (Augmentin®): 875mg/125mg PO bid [adults], 25mg/kg/d PO divided bid [pediatrics]
      - Meropenem: 500mg IV q8h [adults] with dose adjustment for CrCl < 51mL/min, 10mg/kg (max dose: 500mg) IV q8h [pediatrics]
      - Moxifloxacin: 400mg IV or PO qd [adults], contraindicated in pediatric
      - Clindamycin (misses GNR and Pasteurella): 600-900mg IV q8h or 300-450mg PO q6h [adults], 20-40mg/kg/d IV or 8-16mg/kg/d divided in 3 or 4 equal doses [pediatrics]
  - Is there a potential for retained foreign body (metal vs organic material)?
    - Time lapse since injury occurred
    - Last oral intake
    - Last Tetanus shot

Step 3: Exam
- Take a Picture
- Look for RED FLAGS that warrant Senior Resident/Fellow involvement:
  - visible orbital fat - signifies septal violation concerning for damage to deeper structures
    - consider CT imaging
  - laceration of the eyelid margin - requires meticulous closure to avoid long-term sequela from lid margin notching
  - damage to the lacrimal system - shearing forces commonly damage the medial canthal structures
    - suspect with any laceration medial to puncta
    - confirm with probe or irrigation
    - call senior and then likely plastics fellow who will determine repair in ED vs OR, usually repair in the OR within 24-48 hours
  - *NOTE: If you feel uncomfortable, error on the side of caution - call your senior resident

Step 4: Repair
- Obtain Consent
- Anesthetize (1 or 2% lidocaine with 1:100,000 epi in 3 or 5 cc syringe with 27 gauge needle)
- Explore
- Irrigate with copious amounts of sterile saline
- Anti-Sepsis: prep with 5% Betadine
- Prepare a sterile surgical field utilizing Mayo stand with sterile drop cloths (can then open and arrange instruments and suture), sterile gloves, mask, and sterile drape
• Close the wound
  o General Principles
    ▪ Tissue is almost never missing
    ▪ Strive for tension-free closure to avoid lagophthalmos/exposure keratopathy
    ▪ Unless completely unavoidable, avoid making vertically-oriented suture passes as closing a horizontally-oriented wound with vertically-oriented suture passes can cause vertical cicatriztion resulting in ectropion/lagophthalmos/exposure keratopathy
    ▪ Cicatricial changes always pull the lower lid down—attempt to elevate the lower lid as much as possible during repair.
    ▪ NEVER suture the orbital septum
  o Suture selection:
    ▪ In general simple skin closure with 5-0 fast absorbing
      • close deep with 4-0 or 5-0 vicryl
      • close full thickness, lid margin tarsal plate with 5-0 vicryl vertical, mattress sutures x 2 at lid margin
    ▪ consider patient expectations regarding scarring (avoid 5-0 Fast Gut when cosmetics are important)
    ▪ patient reliability for follow-up (avoid non-absorbable sutures in patients unlikely to return for removal)
      • if sure patient will follow up, can consider 7-0 vicryl or 6-0 prolene
    ▪ amount of tension (braided sutures are superior for wound closure on tension)
    ▪ complexity of laceration/necessity of both deep and cutaneous closures (use 5-0 or 6-0 Vicryl for deep closures)
  o Suturing techniques
    ▪ simple, interrupted closure is sufficient and preferable in most cases
    ▪ divide the wound in half with first suture pass, then continue to halve the remaining unclosed wound segments
    ▪ for extensive lacerations, a running closure is more expedient
    ▪ can use a combination of interrupted and running closures, with interrupted sutures placed at points of tension and locations where the laceration changes direction
<table>
<thead>
<tr>
<th>Suture</th>
<th>Absorbability</th>
<th>Filament Type</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-0 Fast Gut</td>
<td>absorbable (1 week)</td>
<td>mono</td>
<td>infection less likely</td>
<td>more difficult to handle</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>highly inflammatory</td>
</tr>
<tr>
<td>7-0 Vicryl</td>
<td>absorbable (4-6 weeks)</td>
<td>braided</td>
<td>easy to handle, least inflammatory of absorbable sutures</td>
<td>infection and suture granuloma more likely</td>
</tr>
<tr>
<td>7-0 Nylon</td>
<td>non-absorbable</td>
<td>mono</td>
<td>least inflammatory, best aesthetic outcomes, infection less likely</td>
<td>requires follow-up for removal</td>
</tr>
</tbody>
</table>

- Apply Erythromycin ophthalmic ointment to the wound
  - If patient has an Erythromycin allergy, can use Bacitracin ointment or Polysporin® (Bacitracin + Polymyxin B) ointment

**Step 5: Post-closure cares/follow-up**
- Apply Erythromycin (vs Bacitracin vs Polysporin®) ophthalmic ointment to the wound TID
- Discuss with fellow and arrange follow-up in Oculoplastics Clinic within 10 days
- Remove sutures (if Vicryl or Prolene were used) 6-10 days post-operatively

**Step 6: Wound Management/Scar Maintenance**
- Avoid direct sunlight exposure for 1 year
- *Once wound is healed*... MASSAGE, MASSAGE, MASSAGE
- 20 strokes TID
- Topical Vitamin E or Mederma
Hyphema

Definition: Layered blood in the anterior chamber vs microhyphema = suspended RBCs only.

History: Mechanism & time of the injury, use of antiplatelet or anticoagulant therapy, Sickle cell (always suspect if African American)

Exam: r/o open-globe, VA, IOP, Slit lamp (note character, extent, color of hyphema, measure dimensions), check for NVI, DFE
*Avoid gonioscopy during the first week.

Ancillary Studies:
- Sickle cell work up in African American
- If you have no view to the back, a gentle B-scan is appropriate, but be very gentle!

Goals
1. Prevent secondary hemorrhage (greatest risk in first 5 days)
2. Control elevated IOP (occur in about 1/3 of patients)

Outpatient treatment
1. To be seen daily in the next four days (others will see next day, then day 4)
2. Limited activity with head elevation as much as possible.
3. Atropine or cyclopentolate BID (for cycloplegia and prevention of pupillary block/synechiae)
4. Prednisolone acetate 1% QID at minimum
5. Control IOP as needed

Indications for Hospitalization – call senior if concern for this
1. Presence of or high risk for secondary hemorrhage
   a. Presenting Va of 20/200 or worse
   b. Initial hyphema greater than 1/3 A/C
   c. Use of antiplatelet or anticoagulant
   d. Positive sickle cell trait or anemia
   e. Delayed medical attention greater than 24 hours
2. Noncompliant patient, parents, or both
3. Hyphemas more than 50%
4. Penetrating ocular trauma
5. Suspected child abuse – gets pediatrics involved
**Indications for Surgery:**

**Most hyphemas, including total hyphemas, should be treated medically for the first 4 days.**

1. Microscopic corneal blood staining (at any time)
2. IOP >50 mmHg despite maximum medical mgmt for >5 days, or >35 mmHg for 7 days (to prevent optic atrophy)
3. Total hyphema or >75% of AC present for 6 days with IOP >24 mmHg (to prevent corneal blood staining)
4. Hyphemas >50% retained longer than 8 days (to prevent peripheral anterior synechiae)
5. Sickle-cell trait or sickle-cell disease patients with hyphema of any size and IOP >35 mmHg > 24 hours

**Patient Instructions**

1. Watch for decrease vision (secondary hemorrhage) or pain (elevated IOP)
2. Avoid antiplatelet or anticoagulant
3. No strenuous physical activities for 2 weeks after injury. Patients should not resume normal activities before 4 weeks after injury.

**References:**

Hyphema

Traumatic

Penetrating

Manage penetrating injury and/or intracocular foreign bodies

Blunt

D/C Anti-coagulant/Antiplalet

If rebleed → gonio check for wound neovascularization

Low risk

Outpatient management

IOP > 30 mmHg

β-blocker

Add α-agonist and/or Carbonic anhydrase inhibitor**

Add Acetazolamide 500 mg po q12hrs

Mannitol 1-2 g/kg IV over 45 min q24 hrs

High risk

Hospitalize

Aminocaproic acid (Amicar)* (50 mg/kg/day; q4 hrs)

Rebleed

Check coagulation profile
Recheck Amicar dose
Retreat for additional 4 days

No rebleed

Day 3: half the dose
Day 4: D/C Amicar dose
Day 5: D/C home

Followed up 2-5 days after D/C to check for rebleed

3-4 weeks later: Gonio; DFE

Yearly

Non-traumatic

Post-surgical

Usually will clear quickly

Follow IOP

Spontaneous

Anticoagulants/Antiplalet
Coagulopathy
Juvenile Xanthogranuloma
Leukemia
Retinoblastoma
Child abuse

Low risk

Outpatient management

IOP > 30 mmHg

β-blocker

Add α-agonist and/or Carbonic anhydrase inhibitor**

Add Acetazolamide 500 mg po q12hrs

Mannitol 1-2 g/kg IV over 45 min q24 hrs

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Aminocaproic acid (Amicar)* (50 mg/kg/day; q4 hrs)

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Check coagulation profile
Recheck Amicar dose
Retreat for additional 4 days

No rebleed

Day 3: half the dose
Day 4: D/C Amicar dose
Day 5: D/C home

Followed up 2-5 days after D/C to check for rebleed

3-4 weeks later: Gonio; DFE

Yearly

*Read<ol> by interfering with plasmin activation</li></ol>

Side effects: orthostatic hypotension; GI disturbances (nausea, vomiting, diarrhea)

Contraindications: pregnancy; renal disease; coagulopathy; cardiovascular or cerebral vascular diseases

All patients need follow up IOP 24-96 hrs after D/C Amicar. Topical form is pending FDA approval. Less side effect with equal efficacy.

** In pt with sickle cell disease, β-blocker is the only Safe IOP controlling agents

CAG: dec AC pH. α-agonist: affect iria vasculature; ephrine: dec O2 in AC and inc inflammation; tautompr: inc inflammation; diuretic: volume contraction and acidosis; methazolamide 50 mg po qhr may be needed (controversial)
**Endophthalmitis**

*Important: MUST CALL PHARMACY FOR INTRAVITREAL ABX: 6-3040 (night/weekend) vs 4-6902 (clinic hours)*

Types:
1. **Exogenous**
   - Post-operative: Acute < 6 weeks, Delayed > 6 weeks (0.1% post uncomplicated CE/IOL)
   - Post-traumatic: Contiguous infections
2. **Endogenous** – need medicine or ID consult to aid in finding source

**History:** Intraocular surgery or injections, trauma, septicemia/systemic symptoms, IV drug abuse, microbial keratitis

**Exam:** Va/ IOP/ Slit lamp/ DFE/echo

**Signs and Symptoms:** Decreased Va, photophobia, chemosis/lid edema, hypopyon (non-shifting), corneal edema/infiltrate, vitreous cell, periphlebitis, inflammation greater than the usual clinical course

**Differential Diagnosis:** TASS, retained lens material, inflammatory conditions, aseptic endophthalmitis

**Factors determining outcome:**
1. **Time to diagnosis**
2. **Time to treatment** (hence, do an efficient exam and get the antibiotics to the vitreous ASAP)
   - If diagnosis known prior to patient arrival (ie outside provider) can have intra-vit abx ready
3. **Organisms**
   - Acute post-operative: staph epidermidis
   - Delayed post-operative: Propionibacterium acnes
   - Bleb associated: Haemophilus or Streptococcus
   - Post traumatic: bacillus

**Preparation:**
- Order set for microbiology (can use cornea order set)
  - Gram stain and culture plates/media (in cornea clinic fridge)
- Intra-vitreal antibiotics (call pharmacy ASAP, as noted above) and order as non-sterile casing
  - ask them to send the medications to tube station 510 (eye clinic by the nurses station)
  - Vancomycin: 1mg/ 0.1 ml intravitreal (overfill syringe to 0.5 ml); 25mg/1.0 ml subconj
  - Ceftazidime: 2mg/0.1ml intravitreal; 25 mg/0.5ml subconj
  - PCN allergic: Gentamycin 200 mcg/0.1ml
- For vit tap – use 25 gauge needle
- For vit inject – use 30 gauge needle

**Management**

*Endophthalmitis Vitrectomy Study (EVS):* study pertains to cataract surgery, careful in extrapolating to other patients

- **Patients:** Endophthalmitis within 6 wks after CE
- **Results:** HM or better: Tap and Inject
  - LP: immediate vitrectomy
  - IV antibiotics do not make any difference
Classification of the Anterior-Chamber Angle

**Spaeth System for Grading Angle Widths:**
A (Anterior): iris inserts anterior to Schwalbe’s line
B (Behind Schwalbe’s line): anterior to posterior limits of the TM
C (Sclera): posterior to the sclera spur
D (Deep): into the ciliary body
E (Extremely deep): into the ciliary body

**Angular Width:**
Estimated angle (expressed in degrees) formed between a line tangential to the trabecular meshwork and a line tangential to the iris surface about one third of the way from the periphery

**Iris configuration:**
F: flat
S: steep curvature
P: plateau

**Van Herick System**
**(good for estimate but you should do gonioscopy exam whenever possible)**

<table>
<thead>
<tr>
<th>Grade of angle</th>
<th>Depth of peripheral chamber</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>&gt; corneal thickness</td>
</tr>
<tr>
<td>3</td>
<td>¼ -½ corneal thickness</td>
</tr>
<tr>
<td>2</td>
<td>⅛ corneal thickness</td>
</tr>
<tr>
<td>1</td>
<td>&lt; ⅛ corneal thickness</td>
</tr>
<tr>
<td>slit</td>
<td>Dangerously narrow</td>
</tr>
</tbody>
</table>
Patient with ELEVATED INTRAOCULAR PRESSURE

A History, ocular examination

Gonioscopy

B Open angle

IOP elevation

Asymmetric

Symmetric

Consider:
Secondary open-angle glaucoma
Trauma
Pseudoexfoliation (p 72)
Pigment dispersion (p 72)
Steroid use
Neovascular glaucoma (p 248)
Iridocyclitis (p 350)
Phacolytic glaucoma

C Narrow angle ± PAS

Consider:
Secondary angle closure
Phacomorphic glaucoma
Iridocyclitis (p 350)
Neovascular glaucoma (p 248)
Choroidal effusion (pp 240, 326)
Tumor (p 326)

D LASER IRIDOTOMY

Repeat gonioscopy

E Visual field test

Dilated fundus examination

F Normal

IOP <30 mm Hg on repeated visits

No risk factors

Observation without treatment

Risk factors

Consider: Medical Therapy

G Glaucomatous nerve damage

IOP ≥30 mm Hg

Medical Therapy

H Monitors:
IOP
Visual fields
Optic nerves

**Laser Settings:**

**Argon LPI**  
Size: 50m  
Duration: 0.02-0.2 sec  
Power: 1 W  
Wavelength: Argon blue green  
Contact lens: Abraham, Wise  

**Pretreat:** Pilocarpine HCL 2% & Brimonidine Tartrate 0.2%, proparacaine  
**Post-treatment:** Check IOP one hour after procedure  
**Rx:** Prednisolone acetate (either 16d taper or QID x 4 days)  
**Follow-up:** If needed in other eye: 2 weeks, otherwise 1 mo f/u

**YAG LPI**  
Size: Fixed  
Duration: Fixed nanoseconds  
Power: 1-2mJ  
Wavelength: YAG  
Contact lens: Abraham, Wise, Lasag CGI

**YAG capsulotomy**  
**Pretreat:** dilate, Brimonidine Tartrate 0.2%, proparacaine  
**Post-treatment:** Brimonidine Tartrate 0.2%,  
Duration: Fixed  
**Follow-up:** 1 mo  
**Power:** 1.2-2mJ  
Wavelength: YAG  
Contact lens: Abraham YAG lens

**ALT**  
Size: 50m  
Duration: 0.1 sec  
Power: 200-1200mW  
Wavelength: Argon green or blue-green  
Contact lens: Goldmann 3-mirror

**SLT**  
Size: 400m  
Duration: set  
Energy: 0.5-1.2mJ  
**Follow-up:** 6 weeks  
Wavelength: 532nm Nd: YAG  
Contact lens: Goldmann 3-mirror or Latina

**Argon Laser Iridoplasty**  
Size: 200-500m  
Duration: 0.2-0.5 sec  
Power: 150-300mW  
Wavelength: Argon blue-green  
Contact lens: None, Goldmann 3-mirror
**Transpupillary Cyclophotocoagulation**
Size: 50-200m
Duration: 0.1-0.2sec
Power: 500-1000mW
Application: 3-5 per ciliary body process  Circumference treated: Up to 180 degree

**Endophotocoagulation**
Size: Fixed 20-gauge probe
Duration: 0.1-0.2sec
Power: 500-1000mW
Application: 3-5 per ciliary body process  Circumference treated: 180 degree-360 degree

**Noncontact Nd:YAG Transscleral Cyclophotocoagulation**
Size: Fixed 70m
Duration: 10-20msec
Power: 4-8 J
Applications: 32
Circumference Treated: 360 degrees

**Contact Nd:YAG Transscleral Cyclophotocoagulation**
Size: Fixed, quartz probe
Duration: 0.5-0.7msec
Power: 4-9 J
Applications: 32
Circumference Treated: 360 degrees or 270 degrees, sparing superonasal quadrant

**Contact Semiconductor Diode Laser Cyclophotocoagulation**
Size: Fixed, quartz probe
Duration: 2 sec
Power: 1750-2000 mW
Applications: 17-24
Circumference Treated: 270-360 degrees

**Laser Suture Lysis**
Size: 50m-100m  Duration:
0.02-0.05sec  Power: 250-500mW
Wavelength: Argon green, Krypton red
Contact lens: Hoskins, Ritch

**Diabetic Retinopathy**
**PRP:**
Size: 200microns Superquad, 350microns Rodenstock, 500microns Pancake/Goldmann
Duration: 20ms (titrate as needed)
Power: 200mW
Increase: +50mW increments
Wavelength: Argon green
CL: Rodenstock, Pancake, Goldmann, Superquad
Macular Edema
Focal Laser:
Size: 50-200m
Duration: 0.1sec
Power: 100mW
Increase: +50mW increments
Wavelength: Argon green
Contact lens: Goldmann, Yanuzzi, Pancake

Diffuse Macular Edema
Laser Grid Treatment:
Size: 100-200m Duration: 0.1sec
Power: 100mW
Increase: +50mW increments Wavelength: Argon green
Contact lens: Goldmann, Yanuzzi, Pancake

BRVO Macular Edema
Laser
Size: 100-200m Duration: 0.1sec Power: 100mW
Increase: +50mW increments Wavelength: Argon green
Contact lens: Goldmann, Yanuzzi, Pancake

BRVO Neovascularization
Laser
Size: 200-500m Duration: 0.1sec Power: 200mW
Increase: +50mW increments Wavelength: Argon green
Contact lens: Rodenstock

CNVM
Laser Photocoagulation
Size: 200-500m Duration: 0.2-0.5sec Power: 200mW
Increase: +50mW increments Wavelength: Argon green, Krypton red
Contact lens: Yanuzzi, Pancake

Retinal Angioma
Photocoagulation
Size: 200-500m
Duration: 0.2-0.5sec
Power: 180mW
Wavelength: Argon green, Dye yellow
Contact lens: Goldmann, Rodenstock
Retinal Telangiectasis
Photocoagulation
Size: 200-500m
Duration: 0.2-0.5 sec
Power: 150mW
Wavelength: Argon green, Dye yellow
Contact lens: Goldmann, Rodenstock

Juxtafoveal Retinal Telangiectasis
Size: 50-100m
Duration: 0.05-0.1 sec
Power: 150mW
Wavelength: Argon green
Contact lens: Goldmann

Choroidal Cavernous Hemangioma
Photocoagulation
Size: 300-1000m
Duration: 0.2-0.5 sec
Power: 150mW
Increase: +50mW increments
Wavelength: Argon green, Krypton red, Argon blue-green, Dye yellow
Contact lens: Rodenstock, Goldmann, Pancake

Retinal Break Treatment
Size: 200-400m
Duration: 0.1-0.2 sec
Power: 150mW
Increase: +10-20mW increments
Wavelength: Argon green, Krypton red
Contact lens: Goldmann, 4-mirror, Panfundus
Guide to Fundus Drawing

Chart contains three concentric circles. Inner circle represents equator, middle circle represents ora serrata, and outer circle represents region of ciliary processes. Band between middle and outer circles is pars plana of ciliary body. Small circle in center of chart represents disc.

Standard key to colors in fundus sketch -

- **Blue** – detached retina, macular, edema, retinal veins
- **Red** – attached retina, retinal arteries, hemorrhage in retina
- **Red Lined w/blue** – retinal breaks
- **Black** – retinal pigmentation, choroidal pigmentation when seen through attached retina
- **Brown** – choroidal pigmentation seen through detached retina
- **Green** – opacities in media, including vit hemorrhage, Weiss ring
- **Yellow** – chorioretinal exudation

On-call, you can use epic drawing tool or you can find fundus drawing paper at the retina front desk.

If you hand draw something on-call that you would like to include in the chart, put the patient’s sticker or identifying information on the paper and turn it into the nurses’ station to be scanned.
Retina Studies

Diabetic Retinopathy Study (DRS):
Questions: Does PRP decrease severe visual loss (SVL; 20/800 or > 6 lines loss) in patients who meet high risk criterion (HRC)?

Results: >50% reduction in the rate of SVL in patients with HRC

Non Proliferative Diabetic Retinopathy (NPDR):
A. Mild: at least one microaneurysm (Heme/Ma < std. photo 2A) not met B,C,D
B. Moderate: H/Ma std. photo 2A/ CWS/HE, VB and/or IRMA not met C,D
C. Severe: nH/Ma in all 4 quadrants or
   VB in 2 or more quadrants > std. photo 6B or
   IRMA > std. photo 8A in at least 1 quadrant
D. Very Severe: Any 2 or more of C above.

Proliferative Diabetic Retinopathy (PDR):
A. Early: new blood vessels on the disc or elsewhere and definition not met by HRC
B. High risk: Must have 3 out of the 4 criterion:
   1. New blood vessels
   2. NVD
   3. NVD > std photo 10A (1/3 - 1/2 DA) or NVE > 1/2 DA
   4. pre-retinal or vitreous hemorrhage.
   *if hemorrhage obscures visualization of the retina, then new vessels are assumed to cover that area not visualized.

Early Treatment Diabetic Retinopathy Study (ETDRS):
A. Defined Clinically Significant Macular Edema (CSME):
   1. retinal thickening within 500 mm (1/3 DD) of center or
   2. hard exudate (HE) within 500 mm of center if adjacent to thickened retina or
   3. retinal thickening at least 1 DA in size, at least part of which is within 1 DD of center
   *Va is not included in the definition of CSME and FFA is not required for diagnosis but will aid treatment. Macular laser treatment in CSME reduces risk of doubling of the visual angle over 3 year period. The goal is to prevent worsened not to improve vision in the future.

B. Confirmed DRS that optimal timing for initiating PRP is at stage of high risk PDR

C. Aspirin use (650 mg Qday) was neither helpful nor harmful in diabetic retinopathy.

Diabetic Retinopathy Vitrectomy Study (DRVS):
Results: Type I diabetes with severe vitreous hemorrhage benefits from early vitrectomy (1-6 months after onset of VH) as compare to late (1 year). No benefit for Type II or mixed.
Bilateral Optic Disc Edema

Use “papilledema” only when secondary to elevated ICP
See images of papilledema grading posted by Drs. Pham and Wall on Eyerounds.org

Grade 0 (Normal)
- radial arrangement of peripapillary nerve fiber layer without axon bundle tortuosity
- blurring of superior and inferior poles is disregarded
- rarely, a major vessel may be obscured (especially superior pole)

Grade 1 (early disc swelling)
- blurring of nasal border (obscured by swollen peripapillary nerve fiber layer)
- radial arrangement of nerve fiber layer is disrupted
- temporal margin is flat and distinct (especially within papillomacular bundle)
  - subtle grayish halo around disc with a temporal gap

Grade 2 (early disc swelling)
- elevation of nasal circumference
- blurring of temporal margin
- complete halo
- concentric or radiating retino-choroidal folds may be present

Grade 3 (moderate)
- elevation of temporal circumference
- increased diameter of nerve head
- circumpapillary halo has irregular outer fringe with finger-like extensions
- elevated borders totally obscure ≥1 segments of the major retinal vessels

Grade 4 (severe)
- elevation of entire nerve with
- obliteration of cup OR
- compression of cup into a slit OR
- total obscuration of a segment of the central retinal artery or vein

Grade 5 (severe - transitional stage towards progressive atrophy)
- anterior expansion dominates over lateral expansion
- nerve assumes a smooth, dome-shaped protrusion
- narrow and smoothly demarcated halo
- major retinal vessels climb steeply over dome surface
- segments of vessels may or may not be obscured by overlying swollen axons
Figure 7-1. Bilateral optic disc edema.

from Lee AG, Brazis PW. Clinical pathways in neuro-ophthalmology: an evidence-based approach. Thieme, 1998, Used with permission
Idiopathic Intracranial Hypertension

Diagnosis - Modified Dandy Criteria:
1. Symptoms/signs of raised intracranial pressure - headache, nausea, vomiting, transient visual obscurations, disc edema
2. No localizing signs with the exception of abducens (sixth/6th) nerve palsy
3. The patient is awake and alert
4. Normal imaging (ideally MRI and MRV) except for signs of raised ICP including partially empty sella, dilated optic nerve sheaths, posterior globe flattening, or transverse venous sinus stenosis/collapse
5. CSF opening pressure of >20 cmH2O and normal CSF studies
6. No other explanation for raised ICP

Review of Systems:
1. Symptoms: weight changes, headaches, nausea, vomiting, transient visual changes, diplopia, photopsias, visual field defects, pulse-synchronous tinnitus
2. Medications: steroids, vitamin A derivatives (including ATRA; used for leukemia chemotherapy), tetracycline antibiotics, lithium
3. Other history: sleep apnea, personal or family history of thrombophilia

Work Up:
1. MRI brain with contrast, MRV head with contrast (note: do not need MRA head)
2. If patient is in ED, an LP may be performed provided that the CSF opening pressure is measured with patient positioned in left lateral decubitus position.
   a. CSF studies: CSF cell count, CSF protein, CSF glucose, and CSF cultures (aerobic and anaerobic).
   b. For atypical presentation, contact neuro-oph fellow or faculty, to ask if further CSF studies (e.g., cytology, viral studies, etc) are needed
3. If patient is in ED and medically appropriate, consider holding off on LP and having it done under fluoroscopy by IR as outpatient (order for procedure and CSF studies will need to be placed on EPIC)

Treatment/Follow Up:
1. Contact senior, neuro-oph fellow, or neuro-oph faculty if fulminant presentation or significant vision loss at presentation (patient may need to be admitted for urgent intervention)
2. Discontinue any precipitating medications (e.g., tetracycline antibiotics)
3. Recommend weight loss if suspected idiopathic intracranial hypertension
4. Contact senior, neuro-oph fellow, or neuro-oph faculty to discuss starting acetazolamide versus at follow up and also to help facilitate the best time for follow-up in Neuro-Ophthalmology clinic
**Neuro-Oph Imaging Studies**

**Thyroid Eye Disease** - CT orbits without Contrast

**Stroke** - MRI brain w/contrast (ADC and DWI), MRA head/neck w/ contrast

**Papilledema** - MRI brain w/ contrast, MRV head w/contrast

**sign elevated ICP = dilation of ON sheath, compressed pituitary/empty sella, posterior globe flattening, disc enhancement**

**Optic Neuritis** - MRI brain with contrast + orbital cuts with fat suppression

**write in comments concern for demylination**

**need full brain to look for additional MS lesions (perpendicular periventricular white matter lesions inc signal=white)**

**Bilateral Optic Neuropathy and or chiasmal syndrome** - MRI orbits w/ contrast (sella protocol) and fat suppression, +/- MRA head w/ contrast to r/o aneurysm

**Acute Painful Horner's** - MRI brain/neck w/ fat saturation, MRA head/neck w/contrast

**Acute third (3rd) nerve palsy** - MRI brain w/contrast, MRA head with contrast VS CTA head w/ contrast

**Multiple cranial nerve (CN) palsies** -MRI brain w/ contrast

**Carotid-Cavernous Fistula** MRI brain with and w/o contrast, MRA brain time of flight, MRA head/neck with contrast
Anisocoria

Anisocoria that increases in dim light and diminishes in brighter light is either physiologic or caused by Horner’s syndrome, a loss of sympathetic innervation to the dilator muscle.


Anisocoria that increases in bright light is indicative of a weak iris sphincter or parasympathetic lesion on the side that does not dilate well.
Giant Cell Arteritis Flowchart

Figure 5-1. Giant cell arteritis.

Figure 10-1. Evaluation of diplopia.

from Lee AG, Brazis PW. Clinical pathways in neuro-ophthalmology: an evidence-based approach. Thieme, 1998. Permission to use this image is pending. Used with permission.
**Dilating a Child**

** prior to seeing the child can place and inpatient rounding order for them to be at the bedside

**Premies -- 2 months of age**

Cyclomydral (cyclopentolate/phenylephrine) 1 gtt x2, five min apart

**2 months – 1 year**

Cyclogyl 0.5% (cyclopentolate) 1 gtt x2, five min apart

+/- phenylephrine for dark irides

**Over 1 year**

Cyclogyl 1% (cyclopentolate) 1 gtt x2, five min apart

+/- phenylephrine for dark irides
Non-accidental Trauma Consult

Ophthalmology is often consulted to comment on the presence or absence of retinal hemorrhages in cases where child abuse is suspected. This can be highly sensitive and litigious. How to proceed:

*HINT: children age six months or younger, a bundled exam using numbing drops and the Alphonso lid speculum is often needed

**Example Note

Assessment:
Ophthalmology consulted to comment on the presence or absence of retinal hemorrhages. No retinal hemorrhages were seen on exam.

Plan:
Follow-up with Ophthalmology Service as needed.
***Using the Retcam

For call purposes, the retcam is generally used for photo-documentation of positive findings in pediatric consults, particularly non-accidental trauma.

The retcam is located in the peds procedure room or the orthoptist office. The key to the room (your Z key will not work) is located in a small pull-out drawer to the left of Angela’s desk. Make sure you have Genteal gel and proparacaine drops available. To turn on:

1. power button below central unit of the computer
2. actual computer button
3. light source to the camera Password is: Retcam12 (case sensitive)

Enter patient information, attending, select new session, ignore selecting eye, by convention start with OD first

Can save using either the foot pedal or with mouse

End session and review to ensure images are adequate and save

You will have to bring the RetCam to photography for them to transfer the images to OIS
Postoperative Troubleshooting

General
It is a good idea to see all post-op patients who call
Contact the attending surgeon if appropriate. Level of contact will vary between attending so when in doubt ask senior resident or try to contact personally

Cataract Extraction
Be mindful of the possibility for endophthalmitis, elevated IOP, or Toxic Anterior Segment Syndrome (TASS)

Penetrating Keratoplasty:

Primary Graft Failure: occurs immediately post-op and reflects faulty donor tissue. High dose topical steroid but may need re-grafting

Secondary Graft Failure:
Rarely occurs within 2 wks but may occur as late as 20 yrs post PK
1/3 of grafts experience rejection but 1/3 of patient with rejection never report symptoms

Symptoms: decreased vision, mild pain, redness, photophobia

Signs: epithelial rejection line, sub-epithelial infiltrates, iritis (especially when accompany by increase graft thickness), KP, endothelial rejection line (Khodadoust line), NV extending onto the graft

Treatment:
1. Topical steroid:
2. Endothelial rejection: PF q1hr while awake; dexamethasone 0.1% ointment qhs
3. Epithelial rejection: PF qid, or twice the current dose, whichever is more
4. Consider cycloplegic agents
5. Consider systemic steroid (PO or IV)
6. Control IOP if increased
7. Close f/u

Loose/ broken sutures:
Suture can be cut with a pre-bended needle (in Cornea clinic)
Grasp knotted end with forceps and pull firmly
Vigamox or Zymar qid x 4 days
PF qid x 4 days then resume previous dose

Retina:
Take all eye or head pain seriously
Think about increased IOP, this should be ruled out before prescribing pain med Examine patient and discuss with senior or retina fellow at minimum
Plastics:

DCR/stenting: Ask the patient to tape the loose stent to the nose. Return to next plastic clinic.

Conformers: if conformer falls out instruct patient to wash it up and attempt replacement on their own, otherwise arrange for follow up next day after informing plastics fellow.

Glaucoma:

<table>
<thead>
<tr>
<th>Presentations</th>
<th>Differential Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>High IOP/ flat Chamber</td>
<td>Aqueous Misdirection Pupillary Block Suprachoroidal Hemorrhage</td>
</tr>
<tr>
<td>High IOP/ normal Chamber</td>
<td>Tight suture</td>
</tr>
<tr>
<td></td>
<td>Acute angle closure</td>
</tr>
<tr>
<td>Low IOP/ flat Chamber</td>
<td>Wound/ Bleb leak Over filtration</td>
</tr>
</tbody>
</table>

Post-op IOP spikes

**Signs/symptoms:**

**Pain**—usually achy that radiates to brow or around eye or headache, nausea/vomiting, red eye, corneal edema (resolves quickly with decrease in IOP), "halos" around lights from edema

**Think etiology:**
Pupillary block (phakic or not?--if the patient is aphakic you could still potentially get block from the anterior vitreous face); related to surgery: hyphema, endophthalmitis, ciliary body swelling (retinal laser), silicone oil, ciliary body or choroidal effusion; steroid induced --usually not before 3 weeks of use

**Treatment:**

**Topicals:** Cosopt Brimonidine

**Systemic:**
Diamox 500 mg not sustained release for acute, can switch to sustained release once IOP is under control
Can do IV if available
Mannitol (20%) 1g/kg

**Procedures:**
LPI – indicated for pupillary block only
Anterior chamber paracentesis
“Burp” wound
**Things To Remember From Internship**

(be thankful that we can consult services that manages these issues)

**Pain**

**PO**
- Tylenol 500mg Q4-6 hours (limit 4g in a day)
- Tylenol with codeine Q4-6 hours up to 2 tabs
- Oxycodone/acetaminophen = Lortab = Vicodin doses: 5, 7.5, 10 comes with 500 mg Tylenol 1-2 tabs q4-6 hours
- Oxycodone 5-10mg Q4-6H (no Tylenol)
- Longer acting: MS Contin (long acting oral morphine)

**IV**
- Morphine 1-2mg Q2-4H, this is a small dose
- Dilaudid (Heavy D) 0.5 to 1mg Q2-4H -- be careful PCA (morphine then Dilaudid)

**Nausea**
- Ondansetron (Zofran) 4mg Q4-8H PO or IV Compazine
- Phenergan (IV can cause ischemia/necrosis)
- Reglan (bowel motility agent)
- Scopolamine patch
- Dexamethasone (prior to leaving OR)

**Sleep**
- Benadryl (watch out in the elderly) 25-50mg Q6H prn
- Ambien 5-10mg QHS
- Trazadone 25-50mg QHS

**Agitation**
- Zyprexa (Zydis) 2.5-5mg Q6H
- Quetiapine (Seroquel) 50mg
- Lorazepam (Ativan) 0.5-1mg IV
- Extreme agitation: Haldol 5mg/Ativan 2mg IM

**Constipation**
- Colace/Senna (100mg BID/2mg Qday)
- Milk of Magnesia
- Miralax or Metamucil Dulcolax supp
- Fleets enema
- Magnesium citrate
- Golytely

**Hyperglycemia**
- Novolog (good short acting) sliding scale (EPIC smartset under “ISS”)
- NPH (better basal insulin for acute setting than Lantus)

**Hypertension**
- home meds taken?
- IV for acute crisis
- B blockers -- labetalol, metoprolol
- Hydralazine -- 10mg IV push to start (seems to work better than metoprolol)

**Hypotension**
- IV fluids -- bolus NS (crystalloid) 500ml to 1L depending on cardiac and renal function
- May need to intubate to resuscitate
- ICU if needed
Driving with a Visual Impairment  (as of 7/14/2015)

Mark E. Wilkinson, O.D.
Director, Vision Rehabilitation Service

Almost daily, individuals with visual impairments confront eye care professionals with questions concerning operating a motor vehicle. These individuals fall into three categories:

- Teenagers with congenital or acquired visual impairment
- Adults with congenital or acquired visual impairment who have never driven
- Adults with acquired visual impairment who will become non-drivers because of decreased visual acuity

Visual Field/Visual Acuity Standards for Driving

Illinois

Visual Acuity:
- > 20/40 in one or both eyes No restrictions
- 20/41-20/70 in one or both eyes No driving when headlights are required
  20/71 - 20/100 in one or both eyes Bioptic telescope required unless living in a town with a population of 3000 or less
  - Must achieve 20/40 or better with no more than a 3x telescope
  - Requires a vision specialist statement indicating the individual has had the telescope a minimum of 60 days and has been trained to use the telescope when driving
  - Requires a behind the wheel test
  - Must be approved by a medical review board
  - No night driving allowed with a bioptic telescope
- < 20/100 in one or both eyes License denied

Visual Field: (uninterrupted is not specified)
- > 140 degrees binocular or monocular No restrictions
- 139 -105 degrees binocular with at least one eye having a monocular field of at least 70 degrees temporal and 35 degrees nasal Vehicle must have left and right outside mirrors
- < 105 degrees binocular or monocular License denied

Illinois uses a vision standard for driving. This standard states that it is the individual’s legal responsibility to notify the Illinois Secretary of State’s office within 10 days of becoming aware that they have reduced visual acuity or visual field limitations that may disqualify them from further driving.
Iowa

Visual Acuity:

- **> 20/40 in one or both eyes**
  - No restrictions

- **20/41-20/70 in one or both eyes**
  - No driving when headlights are required
  - Behind the wheel testing can be requested via discretionary review process to gain privilege to drive when headlights are required.

- **20/71 – 20/199 in one or both eyes**
  - Discretionary issuance
  - Requires a vision specialist statement indicating the individual is visually competent to drive
  - Requires a behind the wheel test
  - The behind the wheel testing is used to determine maximum speed, distance from home and whether ok to drive when headlights are required
  - If VA < 20/100, must also be approved by a medical review board
  - If VA is <20/100 in the left eye, will be required to have a left and right outside mirror

- **< 20/200 in one or both eyes**
  - License denied

Bioptic Telescopes: Not allowed to achieve the visual acuity standards noted above

Visual Field: (uninterrupted is not specified)

- **> 140 degrees binocular**
  - No restrictions

- **< 140 degrees but >110 degrees binocular or >100 degrees monocular**
  - Will be required to have a left and right outside mirror

- **<110 degrees binocular or <100 degrees monocular, but >75 degrees monocular or binocular**
  - Discretionary issuance
  - Requires a vision specialist statement indicating the individual is visually competent to drive
  - Requires a behind the wheel test

- **<75 degrees binocular or monocular**
  - Discretionary issuance
  - Requires a vision specialist statement indicating the individual is visually competent to drive
  - Requires a behind the wheel test
  - Must also be approved by a medical review board

- **<20 degrees binocular or monocular**
  - License denied
Iowa uses a vision standard for licensure. This standard states that the individual is legally qualified to drive, until their license comes up for renewal, regardless of whether their visual acuity or visual field becomes impaired during the interval between licensing renewal. Although individuals with acquired visual impairments are legally qualified to drive until their license is up for renewal, civil liability exposure exists if they continue to drive with the knowledge that they would no longer visually qualify to drive, if they attempted to renew their license. If the Iowa Department of Transportation becomes aware that a person has experienced a decrease in their visual acuity or visual field, the DOT will arrange for a re-evaluation to see if the person is capable of continuing to safely operate a motor vehicle.

**Iowa Dark Window Exemption**

Effective July 4, 2012

ADMINISTRATIVE RULE 761-450.7(3)

The dark window exemptions will no longer be granted from the minimum standard of transparency. A motor vehicle fitted with a front windshield, a front side window or a front side wing window with less than 70 percent but not less than 35 percent light transmittance before July 4, 2012, may continue to be maintained and operated after July 4, 2012, so long as the vehicle continues to be used for the transport of a passenger or operator and the dark window exemption which documented a medical need for such reduced transparency, was signed by the person’s physician before July 4, 2012. The exemption must be carried at all times in the vehicle to which it applies. At such time the vehicle is no longer used for the transport of the passenger or operator that is the subject of the exemption, the exemption expires and may not be used on any replacement vehicle purchased after July 3, 2012. The owner of the vehicle to which the exemption applied must return the vehicle to conformance with the minimum standard of transparency within 60 days of expiration of the exemption.

**Missouri**

Visual Acuity:

- >20/40 in one or both eyes No restrictions
- 20/41-20/160 in one or both eyes Discretionary issuance
- <20/160 in one or both eyes License denied

Bioptic Telescopes: Not allowed to achieve the visual acuity standards noted above

Visual Field: (uninterrupted is not specified)

- >55 degrees in each eye or 85 degrees monocular No restrictions
- 70-109 degrees binocular or monocular Discretionary issuance
- <70 degrees binocular or monocular License denied

Missouri uses a vision standard for licensure. This standard states that the individual is legally qualified to drive, until their license comes up for renewal, regardless of whether their visual acuity or visual field becomes impaired during the interval between licensing renewal. Although individuals with acquired visual impairments are legally qualified to drive until their license is up for renewal, civil liability exposure exists, if
they continue to drive with the knowledge that they would no longer visually qualify to drive, if they attempted to renew their license. If the Missouri Motor Vehicle Department becomes aware that a person has experienced a decrease in their visual acuity or visual field, the DOT will arrange for a re-evaluation to see if the person is capable of continuing to safely operate a motor vehicle.

**Minnesota**

Visual Acuity:
- > 20/40 in one or both eyes  No restrictions
- 20/41-20/70 in one or both eyes  Speed restrictions
  - May also have time of day and radius from home restrictions
- 20/71 - 20/99 in one or both eyes  Discretionary issuance
  - Requires a vision specialist statement indicating the individual is visually competent to drive
  - Requires a behind the wheel test
  - May have speed, time of day and radius from home restrictions
- < 20/100  License denied

Bioptic Telescopes: Not currently allowed to achieve the visual acuity standards noted above

Visual Field: (uninterrupted is not specified)
- > 105 degrees binocular or monocular  No restrictions
- < 105 degrees binocular or monocular  Discretionary issuance - vehicle may require left and right outside mirrors, in addition to speed, radius from home and time of day restrictions
- <100 degrees binocular or monocular  License denied

Minnesota uses a vision standard for driving. This standard states that it is the individual’s legal responsibility to notify the Minnesota Driver and Vehicle Services office when they becoming aware that they have reduced visual acuity or visual field limitations that may disqualify them from further driving.

**Nebraska**

Visual Acuity:
- > 20/40 in one or both eyes  No restrictions
- 20/41-20/60 in one or both eyes  No driving when headlights are required
- 20/60-20/70  If blind in fellow eye, license will be denied
- 20/70 in one or both eyes  No driving when headlights are required and speed limitations
- < 20/71 in one or both eyes  License denied
Bioptic Telescopes: Are allowed to achieve the visual acuity standards noted above

Visual Field: (uninterrupted is specified)

- **> 140 degrees binocular or monocular**  
  No restrictions

- **139-120 degrees binocular or monocular**  
  Vehicle must have left and right outside mirrors

- **100-119 degrees binocular or monocular**  
  No driving when headlights are required
  - Radius from home and speed limitations

- **< 100 degrees binocular or monocular**  
  License denied

Nebraska uses a vision standard for licensure. This standard states that the individual is legally qualified to drive, until their license comes up for renewal, regardless of whether their visual acuity or visual field becomes impaired during the interval between licensing renewal. Although individuals with acquired visual impairments are legally qualified to drive until their license is up for renewal, civil liability exposure exists, if they continue to drive with the knowledge that they would no longer visually qualify to drive, if they attempted to renew their license. If the Nebraska Department of Motor Vehicle becomes aware that a person has experienced a decrease in their visual acuity or visual field, the DOT will arrange for a re-evaluation to see if the person is capable of continuing to safely operate a motor vehicle.

**South Dakota**

Visual Acuity:

- **> 20/40 in one or both eyes**  
  No restrictions if fellow eye is at least 20/50
  - If fellow eye less than 20/60, left and right outside mirrors required

- **20/41-20/60 in one or both eyes**  
  Discretionary issuance
  - Requires a vision specialist statement indicating the individual is visually competent to drive
  - May result in speed, time of day and radius from home restrictions

- **< 20/60 in one or both eyes**  
  License denied

Bioptic Telescopes: Not allowed to achieve the visual acuity standards noted above

Visual Field: **Not considered**

South Dakota uses a vision standard for licensure. This standard states that the individual is legally qualified to drive, until their license comes up for renewal, regardless of whether their visual acuity or visual field becomes impaired during the interval between licensing renewal. Although individuals with acquired visual impairments are legally qualified to drive until their license is up for renewal, civil liability exposure exists, if they continue to drive with the knowledge that they would no longer visually qualify to drive, if they attempted to renew their license. If the South Dakota Department of Public Safety becomes aware that a
Wisconsin
Visual Acuity:
- > 20/40 in one or both eyes  No restrictions
- 20/41-20/100 in one or both eyes  Discretionary issuance
  - Requires a vision specialist statement of visual acuity
  - May require a behind the wheel test
  - May result in speed, time of day and radius from home restrictions
- < 20/100 in one or both eyes  License denied

Bioptic Telescopes: Not allowed to achieve the visual acuity standards noted above

Visual Field: (uninterrupted is not specified)
- > 140 degrees binocular  No restrictions
- 139-40 degrees binocular or monocular  Discretionary issuance
  - Requires a vision specialist statement of visual field
  - May require a behind the wheel test
  - May result in speed, time of day and radius from home restrictions
- < 40 degrees binocular or monocular  License denied

Wisconsin uses a vision standard for licensure. This standard states that the individual is legally qualified to drive, until their license comes up for renewal, regardless of whether their visual acuity or visual field becomes impaired during the interval between licensing renewal. Although individuals with acquired visual impairments are legally qualified to drive until their license is up for renewal, civil liability exposure exists, if they continue to drive with the knowledge that they would no longer visually qualify to drive, if they attempted to renew their license. If the Wisconsin Department of Transportation becomes aware that a person has experienced a decrease in their visual acuity or visual field, the DOT will arrange for a re-evaluation to see if the person is capable of continuing to safely operate a motor vehicle.

Additional Information
--The DOT makes accommodations for the functionally illiterate. An auditory, computer generated voice, test can be provided or the individual can bring someone with them to read the test.

--As part of the author's work up, we ask the following questions. Do you drive? If yes, what type of driving do you do? Do problems with your sight cause you to be fearful when you are driving? During the past 6 months,
have you made any driving errors? Is your driving ability affected by your vision?
--For individuals that are visually impaired who wish to be licensed or to have the privileges of his or her license expanded, a letter from a vision specialist is required and must state, "It is my professional opinion that (patient name) has the visual ability to operate a motor vehicle". The author would also recommend that the letter state "I am requesting that a hearing officer provide (patient name) with a behind the wheel evaluation to see if he/she can acquire/maintain the privilege of operating a motor vehicle".

--A letter can replace the Vision Specialist Form 430032 (Iowa) if all of the information from the departmental vision form is included. This information includes:
1. The patient's full name and address
2. Visual acuity OD, OS, and OU, both uncorrected, corrected, and with new prescription when appropriate.
3. The visual fields for the right and left eye measure nasally and temporally.
4. A statement concerning whether the eye specialist feels the individual is visually competent to drive
5. A statement concerning privileges, whether they be general, daylight only, or limited
6. If limited, the amount of limitations
7. Should vision be rechecked sooner than 2 years
8. The date of the examination, which needs to be within 30 days of the individual's attempt to be licensed or re-licensed.

--The Iowa DOT allows eye care practitioners (MD, DO and OD) to report to the department the identity of a person who has a physical or mental condition which may render that person incompetent to operate a motor vehicle safely. The physician is to make reasonable efforts to notify the person in writing of the nature and reason for the report to the DOT. The physician has no duty to make a report or to warn third parties. The reporting physician is immune from any liabilities, civil or criminal, which may otherwise be incurred or imposed as a result of the report.

--The author feels it is important for the practitioner to counsel those individuals, whose vision has decreased significantly from the time they were licensed, about their increased potential for personal liability if they are involved in an accident. For those individuals whose vision changes after they are licensed, the author would recommend that they be re-evaluated by the DOT to see if they are still capable of continue to safely operate a motor vehicle.
Generic Names, Brand names & Cap Colors

Glaucoma Drops:

Carbonic anhydrase inhibitors (CAIs): ORANGE CAP
  Brinzolamide (Azopt)
  Dorzolamide (Truspot)

Alpha adrenergic agonists: PURPLE CAP
  Brimonidine (Alphagan)

Prostaglandin analogues: TURQUOISE CAP
  Latanoprost (Xalatan)
  Travoprost (Travatan)
  Bimatoprost (Lumigan)

Beta-blockers: YELLOW CAP
  Timolol (Timoptic)

Combination Drugs:
  Timolol-Dorzolamide (Cosopt): Blue/white cap
  Timolol-Brimonidine (Combigan): Navy cap

Other drops:
  Antibiotics: TAN CAP
  Steroids: PINK OR WHITE CAP
  NSAIDS: GRAY CAP
  Mydriatics: RED CAP
  Miotics: GREEN CAP
**Abbreviations**

2xIOL secondary IOL  
2xOAG secondary open angle glaucoma  
4x 4 prism diopter test  
5FU 5-fluorouracil  

A  
A scan 1 dimensional U/S exam of length of eye  
A/V arteriole/venule ratio (normally 2:3)  
A1 Atropine 1%  
ABK aphakic bulous keratopathy  
ABMD anterior basement membrane dystrophy  
AC anterior chamber, accommodative convergence  
AC/A accommodative convergence to accommodation ratio  
ACE angiotensin converting enzyme  
ACH Acetylcholine  
ACIOL anterior chamber intraocular lens implant  
AD autosomal dominant  
AFB Acid Fast Bacilli AG Amsler grid  
AI accommodative insufficiency  
AIBSE acute idiopathic blind spot enlargement  
AIDS acquired immune deficiency syndrome  
AION anterior ischemic optic neuropathy  
AK astigmatic keratotomy, actinic keratosis  
ALK automated lamellar keratoplasty  
ALT argon laser trabeculoplasty  
AMD age-related macular degeneration  
AMP acid mucopolysaccharide  
AMPPE acute multifocal placoid pigment epitheliopathy  
AN1 autosomal dominant familial aniridia  
AN2 sporadic nonfamilial aniridia and Wilms' tumor (Miller's Syndrome, WAGR)  
AN3 autosomal recessive aniridia (Gillespie's Syndrome)  
ANA anti-nuclear antibodies  
ANCA antineutrophil cytoplasmic antibodies  
ANGAU acute nongranulomatous anterior uveitis  
Ap applanation tonometry (Goldmann – slit lamp)  
APD afferent pupillary defect (Marcus-Gunn)  
APUD amine precursor uptake and decarboxylation system  
AR autorefraction, autosomal recessive  
ARC abnormal retinal correspondence  
ARI aldose reductase inhibitor  
ARN acute retinal necrosis  
ARNS Atropine retinoscopy  
ARP Argyle Robertson Pupil  
AS ankylosing spondylitis  
ASB apostilb  
ASC anterior subcapsular cataract  
aistig astigmatism  
AT artificial tears  
ATR astigmatism against the rule  
AVM arterio-venous malformation  
AZT azidothymidine (Zidovudine)  
B  
B scan 2 dimensional U/S exam of eye  
BAT Brightness Acuity Tester  
BCC basal cell carcinoma  
BCG Bacille Calmette-Guerin  
BD base down  
BDR background diabetic retinopathy  
BDUMP syndrome Bilateral diffuse uveal melanocytic proliferation  
BI base in  
BKS Barraquer-Krumeich-Swinger procedure  
BLL brow, lids, lashes  
BM basement membrane  
BMT Benign mixed tumor  
BO base out  
BRAO branch retinal artery occlusion  
BRB blood-retinal barrier  
BRVO branch retinal vein occlusion  
BSS balanced salt solution  
BTX Botulinum toxin BU base up  
BUN blood urea nitrogen  
BVOS Branch Vein Occlusion Study
c-r chorioretinal c/d cup to disc ratio
C/F cell/flare
CA carcinoma
CAGE cut-down, annoyed, guilty, eye-opener
(ETOH screening)
CAI carbonic anhydrase inhibitor
CAR Cancer-Associated Retinopathy syndrome
CB ciliary body
CCF carotid cavernous sinus fistula
CE cataract extraction
CEA carcinoembryonic antigen
CF count fingers, cystic fibrosis
cGy centiGrey
CHARGE association of anomalies: colobomatous
microphthalmos, heart defects, choanal
atresia, retarded growth, genital
anomalies, and ear anomalies or
defearness
CHED congenital hereditary endothelial dystrophy
CHRPE congenital hypertrophy of the RPE
CHSD congenital hereditary stromal dystrophy
CI convergence insufficiency
CIN conjunctival intraepithelial neoplasia
cipro ciprofloxacin
CL contact lenses
clr clear
CME cystoid macular edema
CMV cytomegalovirus
CN cranial nerve
CNS central nervous system
CNV choroidal neovascularization (CVNM,
SRNVM)
CNVM choroidal neovascular membrane (CNV,
SRNVM)
CO corneal opacity (WHO: trachoma)
COAG chronic open angle glaucoma
COM center of macula
COMS Collaborative Ocular Melanoma Study
conj conjunctiva, conjunctivitis
CPA cerebellar-pontine angle
CPEO chronic progressive external
ophthalmoplegia
CPS central posterior synechiae
CRA central retinal artery
CRAO central retinal artery occlusion
CREST calcinosis, Raynaud’s phenomenon,
esophageal symptoms, scleroderma, and
telangiectasia
CRNS Cyclogel retinoscopy
CRV central retinal vein
CRVO central retinal vein occlusion
CS cortical spoking, cavernous sinus
CSA cyclosporine A
CSC central serous chorioretinopathy
CSF cerebrospinal fluid
CSME clinically significant macular edema
CSNB congenital stationary night blindness
CSR Central serous retinopathy
CT computed tomography (CAT scan)
CTL contact lens (es)
CVP central venous pressure
CWS cottonwool spot
cyl cylinder

D
D&C deep & clear
D&Q deep and quiet
D/N distance and at near
D250, D500 Diamox 250mg, Diamox 500mg
DALK deep anterior lamellar keratoplasty
DAST Drug Abuse Screening Test
dB decibel
DC dermatochalasis, discharge
DCCT Diabetes Control and Complications Trial
DCR dacyrocystorhinostomy
DD disc diameter
DDI Didanosine
DDT dye disappearance test
DES Dry Eye Syndrome, disc edges sharp
DLEK deep lamellar endothelial keratoplasty
DM diabetes mellitus, descemets membrane
DME diabetic macular edema
DR diabetic retinopathy
DRS Duane's Retraction Syndrome, Diabetic Retinopathy Study
DS diopter (s) sphere
DSEK descemets stripping endothelial keratoplasty
DUSN Diffuse unilateral subacute neuroretinitis
DVD dissociated vertical deviation
DVM delayed visual maturation
DVSG Diabetic Vitrectomy Study Group

E
E esophoria
E' E at near
E(T) intermittent esotropia
EBMD epithelial basement membrane dystrophy
EBV Epstein-Barr virus
ECA external carotid artery
ECCE extracapsular cataract extraction
ED epithelial defect
EDTA ethylenediaminetetraacetate
EKC epidemic keratoconjunctivitis
ELISA enzyme-linked immunosorbent assay
EM electron microscopy
EMP epimacular proliferation
EOG electrooculogram
EOMI extraocular muscles intact
Epi epikeratophakia
ERD electroretinogram
ERM epiretinal membrane
ERP Early Receptor Potential
ESR erythrocyte sedimentation rate
ET esotropia
ET' ET at near
ETDRS Early Treatment Diabetic Retinopathy Study
ETOH ethanol
EUA exam under anesthesia
EXCIMER excited dimer laser ext externals (same as BLL)

F
F rate of aqueous formation
F&F fix and follow

FA fluorescein angiogram
FAZ foveal avascular zone
FB foreign body
FEV see FEVR
FEVR familial exudative vitreoretinopathy
FHI Fuch's heterochromic iridocyclitis
FNAB fine needle aspiration biopsy
FP fundus photos
FPD fibrous proliferations on or within 1 disc diameter of disc margin
FPE fibrous proliferations elsewhere, not FPD
FSH flame-shaped hemorrhage
FTA--ABS fluorescent treponemal antibody absorption test
FTC full to confrontation
FTCF full to counting fingers
FTHM full to hand motion

G
GA geographic atrophy
GAG glycosaminoglycan
GC gonococcus
GCA Giant Cell Arteritis
GCL ganglion cell layer
GCN good, central and maintained
GCNM good, central, not maintained gent
gentamicin
GFE gas fluid exchange
GMS Gomori Methenamine Silver stain
gonio gonioscopy
GPC giant papillary conjunctivitis
Gy Grey

H
H/Ma hemorrhages or microaneurysms, or both
HA hand applanation (tonometry), homatropine, headache
HA2, HA5 homatropine 2%, homatropine 5%
HBID hereditary benign intraepithelial dyskeratosis
HE hard exudate
HEDS Herpetic Eye Disease Study HIV human immunodeficiency virus
HKM hyperopic keratomileusis
HM hand motion
HPF palpebral fissure width
HPV human papilloma virus
HRC high risk characteristics
HRNS Homatropine retinoscopy
HSV herpes simplex virus
HVF Humphrey Visual Field
HZO Herpes Zoster Ophthalmicus
HZV Herpes Zoster virus

I
IBD inflammatory bowel disease
ICA internal carotid artery
ICCE intracapsular cataract extraction
ICE iridocorneal endothelial syndrome
ICG indocyanine green
ICP intracranial pressure
ICSC Idiopathic Central Serous Chorioretinopathy (CSR)
IDDM insulin-dependent DM
IK interstitial keratitis
ILM internal limiting membrane
IN inferonasal
INL inner nuclear layer
INO internuclear ophthalmoplegia
IO inferior oblique
IOFB intraocular foreign body
IOL intraocular lens implant
ION ischemic optic neuropathy
IOP intraocular pressure
IPL inner plexiform layer
IR inferior rectus
IRMA intraretinal microvascular abnormality
IT inferotemporal
IVFA intravenous fluorescein angiography

J
J Jaeger point
JRA juvenile rheumatic arthritis
JXG juvenile xanthogranuloma

K
K cornea, keratometry
K, sicca keratoconjunctivitis sicca
KA keratoacanthoma
KC keratoconus
KCS keratoconjunctivitis sicca
KG keratoglobus
KP keratic precipitate
KS Kaposi's sarcoma

L
LASE laser adjustable synthetic epikeratoplasty
LASER light amplification by stimulated emission of radiation
LASIK laser in-situ keratomileusis
LE left eye
LGV lymphogranuloma venereum
LHT left hypertropia
LISN Leber's Idiopathic Stellate Neuroretinitis
LK lamellar keratoplasty
LLL left lower lid
LM light microscopy
LN lymph node
LP light perception
LR lateral rectus
LSD lysergic acid diethylamide
LTD largest tumor diameter
LTG low tension glaucoma
LTK laser thermal keratoplasty
LTP laser trabeculoplasty
LUL left upper lid
Lx lensectomy

M
M macula, Mydriacyl
MA macroaneurysm
MD macular degeneration
MDF Map-Dot-Fingerprint Dystrophy
ME macular edema
MELAS Mitochondrial Myopathy, Encephalopathy, Lactic Acidosis and Stroke like Episodes
MEN IIB Multiple Endocrine Neoplasia Syndrome IIB
MERRF myoclonic epilepsy with ragged red fibers
MEWDS multifocal evanescent white dot syndrome
MG myasthenia gravis
MHA-TP micro-hemagglutination--Treponema pallidum
MHC Major Histocompatibility Complex
mito mitochondria
MKM middle limiting membrane mlg malignant
MLM middle limiting membrane
MM malignant melanoma, multiple myeloma
MMC mitomycin C
MMG mixed mechanism glaucoma
Motcc motility with correction
Motsc motility without correction
MP membrane peel
MPS Macular Photocoagulation Study
MR manifest refraction, medial rectus MRD
margin-reflex distance
MRI magnetic resonance imaging
MS multiple sclerosis
MVL moderate visual loss
N neosynephrine
NAG narrow angle glaucoma
NCT noncontact tonometry
NEI National Eye Institute
neo neovascularization
NF neurofibromatosis (e.g. NF1, NF2)
NFL nerve fiber layer
NIDDM non-insulin-dependent DM
NLD nasolacrimal duct
NLP no light perception
NPDR nonproliferative diabetic retinopathy
NPH normal pressure hydrocephalus
NRC normal retinal correspondence
NS nuclear sclerosis
NTG normal tension glaucoma
NVA neovascularization of the angle
NVD neovascularization of the disc
NVE neovascularization elsewhere
NVG neovascular glaucoma
NVI neovascularization of the iris (rubeosis)
OA overaction (as in muscles IO, SO, MR, LR, SR,
IR), ophthalmic artery
OAT ornithine keto-acid aminotransferase
OCP ocular cicatricial pemphigoid
OD oculus dexter (right eye)
ODM ophthalmodynamometry
OHS Ocular Histoplasmosis Syndrome
OIS ocular ischemic syndrome
OKN optokinetic nystagmus
ON optic nerve, optic neuritis, optic neuropathy
ONH optic nerve head (disc)
ONL outer nuclear layer
ONSD optic nerve sheath decompression
OP oscillatory potentials
OPG ocular pneumoplethysmography
OPL outer plexiform layer
Ortho-K orthokeratology
OS oculus sinister (left eye)
OU oculus uterque (each eye individually)

P
P&I probe and irrigate
P1, P2, P4 Pilocarpine 1%, 2%, 4%
PAM primary acquired melanosis, potential acuity meter
PAN polyarteritis nodosa, preauricular node
PARK photorefractive astigmatic keratectomy
PAS peripheral anterior synechia
PAS periodic acid Schiff base stain
PBK pseudophakic bullous keratopathy
PC posterior capsule, posterior chamber
PCIOL posterior chamber intraocular lens implant
PCP pneumocystis carinii pneumonia, primary care provider
PD prism diopters, interpupillary distance
PDGF platelet-derived growth factor
PDR proliferative diabetic retinopathy
PDS pigmented dispersion syndrome
Pe episcleral venous pressure
PED pigment epithelial detachment
PEE punctate epithelial erosions
PERG pattern electroretinogram
PERRLA pupils equally round and reactive to light
and accommodation
PEX pseudoexfoliation
PF Pred Forte
PH pinhole
phaco phacoemulsification
PHPV persistent hyperplastic primary vitreous
PI peripheral iridotomy, peripheral iridectomy
pilo pilocarpine
PK penetrating keratoplasty (PKP)
PKP penetrating keratoplasty (PK)
pl plano
PMMA polymethylmethacrylate
POAG primary open angle glaucoma
POHS presumed ocular histoplasmosis syndrome
PORN progressive outer retinal necrosis “you will know it when you see it”
PP pars planitis
PPD posterior polymorphous dystrophy, purified protein derivative
PPL pars plana lensectomy
PPMD posterior polymorphous dystrophy (PPD)
PPV pars pla na vitrectomy (same as TPPV)
PPVP posterior precortical vitreous pocket
PRK photorefractive keratectomy
PRP panretinal photocoagulation
PS posterior synchia
PSC posterior subcapsular cataract
PSR proliferative sickle retinopathy
PSS progressive systemic sclerosis
PTK phototherapeutic keratectomy
PVD posterior vitreous detachment
PVR proliferative vitreoretinopathy
PXE pseudoxanthoma elasticum
PXF/PXS pseudoexfoliation syndrome
RES recurrent erosion syndrome
RF rheumatoid factor
rhabdo rhabdomyosarcoma
RHT right hypertropia
RK radial keratotomy
RLF retrolental fibroplasia (now ROP)
RLL right lower lid
RNS dilated retinoscopy
ROP retinopathy of prematurity (was RLF)
RP retinitis pigmentosa
RPE retinal pigment epithelium
RPED (see PED)
RRD rhegmatogenous RD
RT retinal thickening, retinal tear
RUL right upper lid
SAH subarachnoid hemorrhage
SB scleral buckle
SBEB scleral buckle with encircling band
SCC squamous cell carcinoma
SCH subconjunctival hemorrhage
SDH subdural hematoma
SE soft exudates (CWS), side effects
SEI subepithelial infiltrates
SK seborrhoid keratosis
SLACH soft lens-associated corneal hypoxia syndrome
SLE slit lamp exam or systemic lupus erythematosus
SLK superior limbic keratoconjunctivitis
SN superonasal
SO superior oblique, sympathetic ophthalmia
SPCAS short posterior ciliary arteries
SPEP serum protein electrophoresis
sph spherical correction
SPK superficial punctate keratitis
SR superior rectus
srf subretinal fluid
SRK Sanders-Retzlaff-Kraff formula
SRNVM subretinal neovascular membrane
SRT Sorbinil Retinopathy Study
SS scleral spur
ST superotemporal  SVL severe visual loss
SVP spontaneous venous pulsations

T
Tl longitudinal relaxation time: time required for the next bulk magnetization to realign itself along the original axis.
T1/2 Timoptic 0.5%
T2 transverse relaxation time: mean relaxation time based on the interaction of hydrogen nuclei within a given tissue.
TA temporal arteritis (GCA)
TAB temporal artery biopsy
TB tuberculosis
TCN tetracycline
TEM transmission electron microscopy
TF trachomatous inflammation-follicular TGF transforming growth factor
TI trachomatous inflammation, transillumination
TM trabecular meshwork
tobra tobramycin
Tp tonopen
TPPV trans pars plana vitrectomy
Trab trabeculectomy
TRD tractional RD
TRIC Trachoma Inclusion Conjunctivitis
TS tuberous sclerosis, Tay-Sach's disease, trachomatous scarring (WHO)
TT trachomatous trichiasis
TVO transient visual obscuration

U
UA underaction (as in muscles)
UGH Uveitis, Glaucoma, Hyphema syndrome
URI upper respiratory tract infection
UV ultraviolet light

V
VA visual acuity
VAcc visual acuity with correction
vanco vancomycin
VAsc visual acuity without correction
VB venous beading

VDRL Venereal Disease Research Laboratory
VECP visually evoked cortical potentials
VEP visual evoked potentials
VER visual evoked response
VF visual fields
VH vitreous hemorrhage
VKH Vogt-Koyanagi-Harada Syndrome/Disease
VPF vertical palpebral fissure height
VRNF von Recklinghausen's Neurofibromatosis (NF-1)
Vx vitrectomy
VZ varicella-zoster

W
w/u workup
W4D Worth-4-Dot test
WAGR Wilms' tumor, aniridia, genitourinary anomalies, and mental retardation
WESDR Wisconsin Epidemiologic Study of Diabetic Retinopathy
WHO World Health Organization
WNL within normal limits
WRx prescription of corrective lenses currently worn
WTR astig with the rule astigmatism

X Y Z
Xexophoria
X' X at near
X(T) intermittent exotropia
XLM external limiting membrane
XRT radiation therapy
XT exotropia XT' XT at near
YAG yttrium-aluminum-garnet laser
### Department Phone numbers:

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<td>RETINA</td>
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<td>Eye Bank Lab</td>
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<td>**after 5:00, call 356-1616</td>
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<td>Optician, contact lens</td>
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<td>Optician, spectacles</td>
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<td>OR – ASC</td>
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<td>OR – MAIN</td>
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<td>OR – Ophthalmic Procedure Suite</td>
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<tr>
<td></td>
<td>SCHEDULING CENTERS:</td>
<td></td>
</tr>
<tr>
<td>5269</td>
<td>CLINIC APPOINTMENTS</td>
<td>6-2852</td>
</tr>
<tr>
<td></td>
<td>PEDs OPH &amp; STRABISMUS</td>
<td>6-2859</td>
</tr>
<tr>
<td>4133/5009</td>
<td>SURGERY SCHEDULING</td>
<td>6-2882</td>
</tr>
<tr>
<td>4215</td>
<td>Social Worker (Ophthalmology)</td>
<td>6-7121</td>
</tr>
<tr>
<td></td>
<td>Vascular Research Lab</td>
<td>5-8267</td>
</tr>
<tr>
<td></td>
<td>VA Hospital – Iowa City</td>
<td>158-6355</td>
</tr>
<tr>
<td></td>
<td>VA Hospital – Des Moines</td>
<td>515-699-5815</td>
</tr>
<tr>
<td></td>
<td>Broadlawns – Des Moines</td>
<td>515-282-2200</td>
</tr>
<tr>
<td></td>
<td>VIP Services (PAT mobile)</td>
<td>6-8140</td>
</tr>
</tbody>
</table>
### Basic Phrases in Spanish

<table>
<thead>
<tr>
<th>English</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CASE HISTORY</strong></td>
<td></td>
</tr>
<tr>
<td>Good Morning</td>
<td>Buenos Dias</td>
</tr>
<tr>
<td>Good Afternoon</td>
<td>Buenos Tardes</td>
</tr>
<tr>
<td>My name is...</td>
<td>Mi nombre es...</td>
</tr>
<tr>
<td>I only speak a little Spanish. Please limit your answers to yes or no when possible.</td>
<td>Solamente hablo un poco de Espanol. Por favor limite sus respuestas a si o no cuando es possible.</td>
</tr>
<tr>
<td>How are you?</td>
<td>Como estas?</td>
</tr>
<tr>
<td>What is your name?</td>
<td>Como se llama?</td>
</tr>
<tr>
<td>Please write your address here...</td>
<td>Por favor escriba su direccion aqui.</td>
</tr>
<tr>
<td>How old are you?</td>
<td>Cuantos anos tiene usted?</td>
</tr>
<tr>
<td>Have you been here before?</td>
<td>Ha estado aqui antes?</td>
</tr>
<tr>
<td>How long ago?</td>
<td>Hace cuanto tiempo?</td>
</tr>
<tr>
<td>When was your last eye exam?</td>
<td>Cuando fue su ultimo examen de los ojos?</td>
</tr>
<tr>
<td>What is the reason for your visit?</td>
<td>Cual es la razon de su visita?</td>
</tr>
<tr>
<td>Do you use glasses or contacts?</td>
<td>Usa espejuelos o lentes de contacto?</td>
</tr>
<tr>
<td>Do you have glasses or contacts?</td>
<td>Tiene gafas o lentes de contacto?</td>
</tr>
<tr>
<td>Do you use them for seeing far away or for up close?</td>
<td>Los us para ver de lejos o de cerca?</td>
</tr>
<tr>
<td>Have you noticed any changes in your vision?</td>
<td>Ha notado cambios en la vista</td>
</tr>
<tr>
<td>Which eye? Both?</td>
<td>En cual ojo? Los dos?</td>
</tr>
<tr>
<td>Do you have problems seeing at a distance?</td>
<td>Tiene problemas para ver de los lejos?</td>
</tr>
<tr>
<td>Do you have problems seeing while reading?</td>
<td>Tiene problemas para ver para leer?</td>
</tr>
<tr>
<td>How long has it been since you noticed this problem?</td>
<td>Hace cuanto tiempo que nota este problema?</td>
</tr>
<tr>
<td>Show me at what distance you read.</td>
<td>Muestreame a que distancia usted puede leer?</td>
</tr>
<tr>
<td>Do you get headaches?</td>
<td>Tiene dolores de cabeza?</td>
</tr>
<tr>
<td>In the morning, afternoon, or evening?</td>
<td>Por la manana, tarde o la noche?</td>
</tr>
<tr>
<td>When you read?</td>
<td>Cuando lee?</td>
</tr>
<tr>
<td>At work, or at school?</td>
<td>En el trabajo o en la escuela?</td>
</tr>
<tr>
<td>Show me in what part of your head.</td>
<td>Muestreame en que parte de la cabeza.</td>
</tr>
<tr>
<td>Do you get pain in your eyes?</td>
<td>Tiene dolor en los ojos?</td>
</tr>
<tr>
<td>Always?</td>
<td>Siempre?</td>
</tr>
<tr>
<td>Sometimes?</td>
<td>A veces?</td>
</tr>
<tr>
<td>Since when did it begin?</td>
<td>Hace cuanto tiempo que empezo?</td>
</tr>
<tr>
<td>Has it become worse?</td>
<td>Se ha puesto peor?</td>
</tr>
<tr>
<td>During the morning?</td>
<td>Por la manana?</td>
</tr>
<tr>
<td>In the afternoon?</td>
<td>Por la tarde?</td>
</tr>
<tr>
<td>At night?</td>
<td>Por la noche?</td>
</tr>
<tr>
<td>Do your eyes ever burn?</td>
<td>Alguna vez le arden los ojos?</td>
</tr>
<tr>
<td>Do your eyes ever itch?</td>
<td>Alguna vez le pican los ojos?</td>
</tr>
<tr>
<td>Do your eyes ever tear?</td>
<td>Alguna vez le lloran los ojos?</td>
</tr>
<tr>
<td>Have you ever injured your eyes?</td>
<td>Alguna vez se ha lastimado los ojos?</td>
</tr>
<tr>
<td>In what eye?</td>
<td>En cual ojo?</td>
</tr>
<tr>
<td>Was it a blow to the eye?</td>
<td>Los dos?</td>
</tr>
<tr>
<td>A cut?</td>
<td>Fue un golpe al ojo?</td>
</tr>
<tr>
<td>Did something enter the eye?</td>
<td>Una cortadura</td>
</tr>
<tr>
<td>Have you ever had eye surgery?</td>
<td>O algo que le entro en el ojo?</td>
</tr>
<tr>
<td>When?</td>
<td>Ha sido operada de la vista?</td>
</tr>
<tr>
<td>For cataracts?</td>
<td>Cuando?</td>
</tr>
<tr>
<td>Myopia?</td>
<td>Para cataratas</td>
</tr>
<tr>
<td>For something that entered the eye?</td>
<td>Miopia?</td>
</tr>
<tr>
<td>Strabismus?</td>
<td>Por algo que le entro en el ojo?</td>
</tr>
<tr>
<td>Have you ever had any disease in the eye?</td>
<td>Ha tenido alguna enfermedad de los ojos?</td>
</tr>
<tr>
<td>Glaucoma?</td>
<td>Glaucoma?</td>
</tr>
<tr>
<td>Cataracts?</td>
<td>Cataratas?</td>
</tr>
<tr>
<td>Infection?</td>
<td>Infeccion?</td>
</tr>
<tr>
<td>Question</td>
<td>Translation</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>--------------------------------------</td>
</tr>
<tr>
<td>When was your last medical exam?</td>
<td>Cuando fue su último examen medico?</td>
</tr>
<tr>
<td>Are you taking any medications?</td>
<td>Esta tomando alguna medicina?</td>
</tr>
<tr>
<td>Please write the name here.</td>
<td>Por favor escriba el nombre aqui.</td>
</tr>
<tr>
<td>How long have you taken it?</td>
<td>Hace cuanto tiempo la toma?</td>
</tr>
<tr>
<td>What do you take it for?</td>
<td>Para que la toma?</td>
</tr>
<tr>
<td>Do you have any allergies to any medications?</td>
<td>Tiene alergias a alguna medicina?</td>
</tr>
<tr>
<td>Which one?</td>
<td>Cual?</td>
</tr>
<tr>
<td>Is there a possibility that you are pregnant?</td>
<td>Es posible que esta embarazada?</td>
</tr>
<tr>
<td>Do you take contraception?</td>
<td>Esta tomando anticonceptivos?</td>
</tr>
<tr>
<td>Do you have or ever have had:</td>
<td>Usted tiene o ha tenido:</td>
</tr>
<tr>
<td>Diabetes</td>
<td>Diabetes</td>
</tr>
<tr>
<td>Kidney problems</td>
<td>Problemas con los riñones</td>
</tr>
<tr>
<td>Thyroid problems</td>
<td>Problemas con la tiroides</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>Alta presion</td>
</tr>
<tr>
<td>Do you have sinus problems?</td>
<td>Tiene sinusitis?</td>
</tr>
<tr>
<td><strong>Visual Acuity</strong></td>
<td></td>
</tr>
<tr>
<td>Cover your left/right eye.</td>
<td>Cubra su ojo izquierdo/derecho.</td>
</tr>
<tr>
<td>Please read the smallest letters you can see.</td>
<td>Por favor lea las letras mas pequenas que pueda ver.</td>
</tr>
<tr>
<td>How many fingers?</td>
<td>Cuantos dedos?</td>
</tr>
<tr>
<td>Is the hand moving?</td>
<td>Se mueve la mano?</td>
</tr>
<tr>
<td>Do you see the light?</td>
<td>Ve la luz?</td>
</tr>
<tr>
<td>Where?</td>
<td>Donde?</td>
</tr>
<tr>
<td><strong>Color Plates</strong></td>
<td></td>
</tr>
<tr>
<td>Please tell me what you see.</td>
<td>Por favor diagame lo que vea.</td>
</tr>
<tr>
<td><strong>Stereo</strong></td>
<td></td>
</tr>
<tr>
<td>Global Stereopsis</td>
<td>Que ve en el lado derecho?</td>
</tr>
<tr>
<td>Local Stereopsis</td>
<td></td>
</tr>
<tr>
<td>Which circle is closer to you?</td>
<td>Cual circulo se ve mas cerca a usted?</td>
</tr>
<tr>
<td>In number one, two...</td>
<td>En el numero uno, dos, tres, cuatro, cinco, seis, siete, ocho, nueve, diez</td>
</tr>
<tr>
<td><strong>NPC</strong></td>
<td></td>
</tr>
<tr>
<td>Please fixate on this and tell if it doubles.</td>
<td>Por favor fije su vista en la letra y digame si se ve doble.</td>
</tr>
<tr>
<td>Now tell me when you see one.</td>
<td>Ahora digame cuando vea uno.</td>
</tr>
<tr>
<td><strong>Pupillary distance</strong></td>
<td></td>
</tr>
<tr>
<td>Please look at my open eye.</td>
<td>Por favor mire mi ojo que esta abierto.</td>
</tr>
<tr>
<td><strong>Near point of Accommodation</strong></td>
<td></td>
</tr>
<tr>
<td>Please look at these letters and tell me when they blur.</td>
<td>Por favor mire estas letras y digame cuando se pongan borrasas.</td>
</tr>
<tr>
<td><strong>Cover Test</strong></td>
<td></td>
</tr>
<tr>
<td>Look at the right light.</td>
<td>Mire la luz roja.</td>
</tr>
<tr>
<td>Please look at the letter.</td>
<td>Por favor mire la letra.</td>
</tr>
<tr>
<td><strong>Confrontation Fields</strong></td>
<td></td>
</tr>
<tr>
<td>Please cover your left/right eye and look at my nose.</td>
<td>Por favor cubra su ojo izquierda/derecho y mire mi nariz.</td>
</tr>
<tr>
<td>Tell me when you first see this.</td>
<td>Digame cuando primero vea esto.</td>
</tr>
<tr>
<td><strong>EOMs</strong></td>
<td></td>
</tr>
<tr>
<td>Please follow my light with your eyes without moving your head.</td>
<td>Por favor siga mi luz con los ojos sin mover la cabeza.</td>
</tr>
<tr>
<td><strong>Pupillary Reflexes</strong></td>
<td></td>
</tr>
<tr>
<td>Please look straight ahead and ignore my light.</td>
<td>Por favor mire hacia adelante e ignore mi luz.</td>
</tr>
<tr>
<td><strong>Keratomy</strong></td>
<td><strong>Retinoscopy</strong></td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Place your chin here.</td>
<td>Pongal la barbilla aqui.</td>
</tr>
<tr>
<td>Place your forehead here.</td>
<td>Pongal la frente aqui.</td>
</tr>
<tr>
<td>Look into the center on the instrument.</td>
<td>Mire al centro del instrumento.</td>
</tr>
<tr>
<td>Keep both eyes open.</td>
<td>Mantenga los dos ojos abiertos.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Subjective</strong></th>
<th><strong>Balance</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Read the smallest line of letters you can see.</td>
<td>Lea la linea le letra mas pequeñas que pueda ver.</td>
</tr>
</tbody>
</table>
| Which one is better, one or two? | Que un o dos?

<table>
<thead>
<tr>
<th><strong>Cross-cylinder fused</strong></th>
<th><strong>NRA/PRA</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Which group of lines are darker, the vertical or horizontal one?</td>
<td>Cual grupo de lineas esta mas oscuro, las verticales o las horizontales?</td>
</tr>
<tr>
<td>Keep this line of letters clear.</td>
<td>Mantenga esta linea de letras clara.</td>
</tr>
<tr>
<td>Say &quot;blurry&quot; when it first blurs.</td>
<td>Diga &quot;borroso&quot; cuando se ponga borroso.</td>
</tr>
<tr>
<td>Can you clear it completely?</td>
<td>Puede aclaraarlo completamente?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Lateral/Vertical Phorias</strong></th>
<th><strong>Lateral/Vertical Vergences</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you see this second line of letters?</td>
<td>Vez esta segunda linea de letras?</td>
</tr>
<tr>
<td>Is it to the right or to the left?</td>
<td>Esta a la derecha o izquierda?</td>
</tr>
<tr>
<td>Or is it directly underneath?</td>
<td>O esta directamente debajo?</td>
</tr>
<tr>
<td>Tell me when it is directly underneath.</td>
<td>Dígame cuando esta exactamente debajo.</td>
</tr>
<tr>
<td>Keep this line of letters clear.</td>
<td>Mantenga esta linea de letras clara.</td>
</tr>
<tr>
<td>Do you see the second line?</td>
<td>Vez esta segunda linea?</td>
</tr>
<tr>
<td>Is it on the top or bottom?</td>
<td>Esta arriba o abajo?</td>
</tr>
<tr>
<td>Or is it next to it?</td>
<td>O esta al lado?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Biomicroscopy</strong></th>
<th><strong>Internals</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>I am going to examine the front of the eye.</td>
<td>Voy a examinar el frente del ojo.</td>
</tr>
<tr>
<td>Close your eyes.</td>
<td>Cierre sus ojos.</td>
</tr>
<tr>
<td>Open your eyes more.</td>
<td>Abre los ojos mas.</td>
</tr>
<tr>
<td>I am going to examine the lids.</td>
<td>Voy a examinar los palpadors.</td>
</tr>
<tr>
<td>Look down.</td>
<td>Mira abajo.</td>
</tr>
<tr>
<td>Look up.</td>
<td>Mira arriba.</td>
</tr>
<tr>
<td>I would like to dilate your pupils in order to examine the inside of your eyes.</td>
<td>Me gustaria dilatar las pupilas para examinar dentro de los ojos.</td>
</tr>
<tr>
<td>You will not be able to see up close for a couple of hours, is that a problem?</td>
<td>No podra ver de cerca durante unas horas, esta bien?</td>
</tr>
<tr>
<td>I am going to put drops in your eyes.</td>
<td>Le voy a poner gotas en los ojos.</td>
</tr>
<tr>
<td>Look at the red light.</td>
<td>Mira la luz roja.</td>
</tr>
<tr>
<td>Look up and to the right.</td>
<td>Mira arriba y a la derecha.</td>
</tr>
<tr>
<td>Look up and to the left.</td>
<td>Mira arriba y a la izquierda.</td>
</tr>
<tr>
<td>Look down and to the right.</td>
<td>Mira abajo y a la derecha.</td>
</tr>
<tr>
<td>Look down and to the left.</td>
<td>Mira abajo y a la izquierda.</td>
</tr>
</tbody>
</table>
**FAQ**

"I had eye surgery the other day and my eye is watery."
- Some degree of irritation and watering is normal after eye surgery. Are you having an increase in redness? Are you having pain in the eye? Is your vision getting worse? If any of these are true, you should come in tonight so that I can take a look, since I can’t rule out an infection or high pressure in the eye over the phone.
- (NOTE: Have a very low threshold for bringing in a postoperative patient who calls with a concern)

"I've had glaucoma surgery and my eye is red. I think I have pink eye."
- Patients that have had trabeculectomy are at increased risk of infection inside the eye. If you've had a trabeculectomy, you should come in tonight to make sure your bleb and your eye aren't infected. It could be simple conjunctivitis, but you need to come in so we can make sure.

"I had retina surgery earlier this week and my eye has been hurting. It hurts right above my eyeball, and I feel sick to my stomach. Can you prescribe something for the nausea?"
- I'm concerned that the pressure in your eye may be elevated, which can happen after eye surgery, especially retina surgery. I want you to come in tonight to be seen.

"I had endothelial transplant (DMEK, DSAEK) and now I see a large floater on top portion of my vision."
- As the AC bubble reabsorbs the meniscus involves the visual axis. No need to worry as long as symptoms fit what you expect with the dynamics of a floating bubble.

"I had an intravitreal injection today and my eye is tearing, red, and painful."
- It is normal for the eye to be red after an injection. Tearing and pain after the injection is usually due to the toxicity of the iodine and numbing medication. This usually improves very quickly over the course of 12-24 hours with rest, Tylenol and artificial tears. If this does not improve (in 12-24h) or gets worse in any way, call back so we can see you.

"My bandage contact lens fell out. Do I need to come in?"
- You can attempt to carefully put it back in yourself or with help if you are comfortable doing so. If the eye feels uncomfortable, increase lubrication. If the eye is still uncomfortable or if the lens was placed for a corneal wound leak, we can arrange for you to be seen tomorrow to replace it or you can see a local eye care provider if you live a long distance away.

"My nasolacrimal duct stent is coming out. Do I need to come in?"
- You can carefully feed it back into the tear duct with your fingers if you feel comfortable doing so. Otherwise, tape the protruding end to your cheek and we will arrange to see you tomorrow to replace it.

"Outside provider: I have a patient with an orbital fracture, do they need to be seen?"
- At UIHC, we examine all orbital fractures acutely. Please transfer them to our ETC evaluation.
"I have AMD and am noticing new metamorphopsias."
- This may indicate changes in your macular degeneration. If there are significant changes (conversion to wet AMD), the primary treatment is an intraocular injection and we do not have the capability to do this overnight. We can arrange for an evaluation in the morning.

"I have a new floater in my vision."
- I think you should be seen to evaluate this. If you can count the number of new floaters on 1 hand, we can arrange to see you in the morning (per Dr. Russell's previous comments). If there are more floaters than you can count or if you are having associated flashes, we should see you tonight.
Notes