

Assessment and Diagnostic Guideline: Eyes

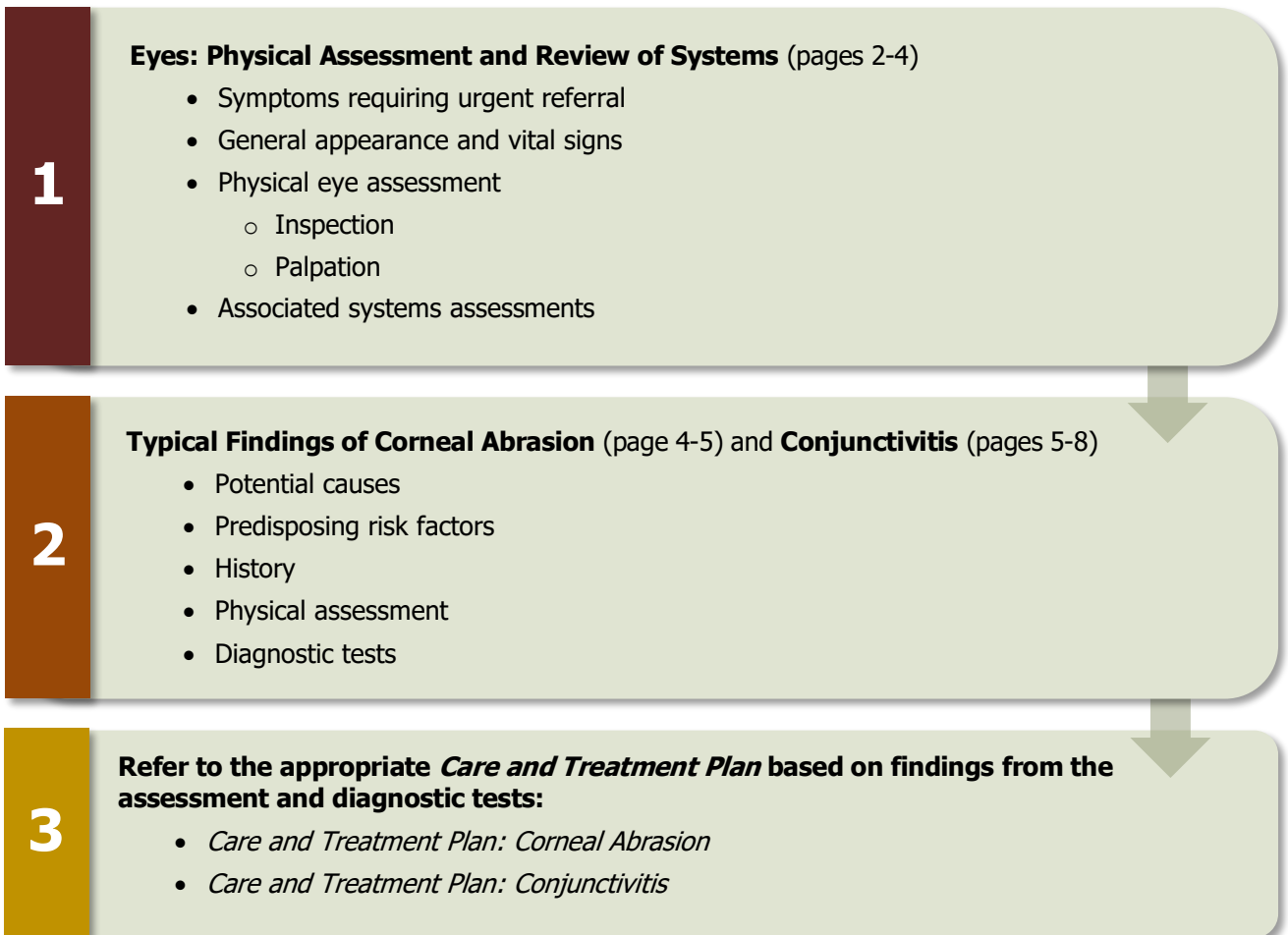
Registered Nurses who hold Certified Practice (RN(C)) designation in **Remote Nursing** and **RN First Call** are authorized to manage, diagnose, and/or treat the following ear, nose, and throat conditions:

- Conjunctivitis (adults and children who are **6 months of age and older**)
- Minor corneal abrasion (adults and children who are **two years of age and older**)

This Guideline provides guidance to RN(C)s when conducting assessments and diagnostic tests related to eye conditions that can be managed and/or treated under the Certified Practice framework. RN(C)s maintain an RN scope of practice which is expanded in particular circumstances wherein the RN(C) is able to diagnose and treat the specific conditions listed above.

RN(C)s must ensure they complete and document their assessments according to regulatory practice standards and their practice setting requirements. Upon arriving at a diagnosis, RN(C)s should consult the relevant *Care and Treatment Plans* to inform the management and treatment of the condition.

Visual Summary of Guideline



1) Eyes: Physical Assessment and Review of Systems

*Refer to the Assessment and Diagnostic Guideline: General as needed.

In addition to the general characteristics outlined in the *Assessment and Diagnostic Guideline: General*, for any client presenting symptoms affecting their eyes, review this list to ascertain additional signs and/or symptoms which may aid your clinical reasoning when considering conditions that can be treated by one of the DSTs.

Symptoms Requiring Urgent Referral

The first step is to differentiate major or serious causes of red eye from minor causes.

The following signs and symptoms require referral to a physician or nurse practitioner:

- Unilateral or bilateral eye pain
- Ocular pain
- Ocular injury of any kind
- Severe photophobia of unknown cause
- Persistent blurring of vision
- Recent onset of visual disturbances: light flashes, floaters (recent onset), halos, dimming, visual distortion, double vision, abnormal colour perception or loss of visual acuity
- Visual field loss
- Reduced ocular movement
- Exophthalmos (proptosis)
- Ciliary flush
- Scleral icterus
- Hyphema
- Irregular cornea (epithelial defect or opacity, irregular corneal reflection of light)
- Non-reactive pupil
- Treatment failure after three days
- Worsening symptoms
- Compromised host (e.g., immunosuppressed client)
- Signs of preseptal or orbital cellulitis
- Symptoms in conjunction with a communicable disease (e.g., chicken pox)
- Finger like (dendritic) projections noted on fluorescein stain (herpetic)

Vision Review of System Questions

- See the 'Review of Systems: Eyes' section in the *Assessment and Diagnostic Guideline: General* if not already done.

General Appearance and Vital Signs

- Apparent state of health
 - Acutely or chronically ill
- Match between appearance and stated age
 - Appearance of comfort or distress
 - Diaphoresis
 - Ability to speak in full sentences without stopping to take a breath
 - Skin colour

- Nutritional status
- Hydration status (older adults at risk)
- Hygiene
- Gait and mobility status
- Piercings and tattoos
- Vital signs
 - Temperature
 - Pulse
 - Respiration
 - SpO₂
 - Blood pressure (BP)

Additional Pediatric Considerations

- Appears stated age and within growth parameters
- Degree of consolability and cooperation
- Activity level
- Emotional reaction to caregiver and examiner
- Character of cry
- Bruising, contusions, abrasions (suggestive of trauma)

Physical Assessment of the Eye**Inspection**

Test visual acuity, visual field:

- Bony Orbit: edema, lesions, bruising
- Lids and lashes: ability to open and close, edema, erythema, crusting, eyelash position, tremors, foreign bodies, lesions; evert upper lids as required
- Lacrimal apparatus: tearing, size
- Conjunctiva and sclera: colour, pattern of injection, discharge, edema, haemorrhage, pterygium, foreign body
- Cornea: clarity, abrasions or lacerations, arcus senilis (lipid deposition around cornea), foreign body
- Pupil and iris: colour, size, shape, reactivity to light, accommodation
- Lens: transparency, opacities
- Fundi: red reflex, haemorrhage, optic disc, retinal vasculature
- Extraocular muscles: extra ocular eye movements (EOEM)

Additional Pediatric Considerations

- Visual acuity in children greater than 3 years of age
- Using a tumbling E or picture chart for children over 3 years of age or who cannot read the alphabet
- Most infants are farsighted, gradually gaining acuity as they develop, attaining approximately 20/50 by one year of age, and 20/20 by 6-8 years of age
- Test visual field in older children if concern about glaucoma
- Position and alignment of eyes (strabismus): use corneal light reflex test, cover-uncover test



Palpation

- Palpate the bony orbit, forehead, eyebrows, eyelids, lacrimal apparatus, and pre-auricular lymph nodes for tenderness, swelling or masses
- *Do not palpate globe if rupture injury is suspected or if the client has undergone recent eye surgery.*

Associated Systems

- An ENT examination, including the lymph nodes of the head and neck, should also be performed if there are symptoms of a systemic condition, such as viral URTI (upper respiratory tract infection) or a sexually transmitted infection (STI), (e.g., gonorrhea) is suspected.
 - Ear pain
 - Nasal discharge
 - Sore throat
 - Cough
 - Nausea or vomiting
 - Urethral, vaginal or rectal discharge
 - Pain or inflammation of the joints
- Pre-auricular adenopathy might indicate chlamydial, viral, or invasive bacterial infection of the eye (e.g., gonorrhea)

Abdomen

- Assess liver for tenderness and enlargement if eye symptoms are associated with symptoms of an STI.

Genitourinary System and Rectal Area

- Assess for urethral, cervical, or vaginal discharge if eye symptoms are associated with symptoms of an STI.

Musculoskeletal System and Extremities

- Examine the joints to assess for warmth, redness, pain or swelling if eye symptoms are associated with possible autoimmune causes/conditions.

2) Typical Findings

Corneal Abrasion

Potential Causes

Usually trauma or foreign body in the eye:

- Fingernails
- Animal paws
- Pieces of paper, cardboard, wood, or metal
- Makeup applicators
- Hand tools
- Branches or leaves
- Thermal burns and/or ultraviolet light burns from: welding, tanning bed use, snow blindness and direct viewing of the sun

History

- Trauma

- Sudden unilateral eye pain (sharp or worse with blinking)
- Mild blurred vision (due to tearing) may be present
- Mild photophobia
- Moderate to profuse tearing
- Foreign-body sensation
- Wearing contact lens

Physical Assessment

A topical anesthetic, e.g., tetracaine, may be used if the examination is uncomfortable for the patient.

- Vital signs normal
- Visual acuity may be slightly blurred in affected eye
- Diffuse conjunctival injection
- Central conjunctival injection or ciliary flush often denotes a more serious problem than slight but diffuse injection
- Pupils equal, round, and reactive to light and accommodation (PERRLA)
- Presence of a foreign body under the upper or lower eyelid must be ruled out; evert the lids and inspect carefully
- *Note:* a rust ring may form around foreign bodies that contain iron, typically those that are metallic

Additional Pediatric Considerations

- Weigh for medical calculations

Diagnostic Tests

Apply fluorescein stain to test for corneal integrity if there is a possibility that a corneal abrasion has occurred.

- Apply fluorescein stain. Corneal cells that are damaged or lost will stain green; cobalt blue light allows easier visualization of the abrasion.

Conjunctivitis

Potential Causes

- Conjunctivitis is usually viral or bacterial
- The allergic form is more common when accompanied by other allergic symptoms such as rhinitis
- Other causes include:
 - Wearing contact lenses
 - Foreign body, acid or alkali burn to eye
 - Preseptal or orbital cellulitis
 - Corneal injury
 - Uveitis and glaucoma all of which are referred to a physician or nurse practitioner

Bacterial Pathogens

- Haemophilus influenzae (non-typable)
- Streptococcus pneumoniae
- Neisseria gonorrhoeae
- Pseudomonas Aeruginosa
- Staphylococcus aureus

- Chlamydia

Additional Pediatric Considerations

- *Note:* In youth, gonococcal or chlamydial infection should be considered if the history is supportive of this diagnosis.

Viral Pathogens

Cause up to 80% of all cases of acute conjunctivitis.

- Adenovirus
- Coxsackie virus
- Enterovirus 70
- Herpes simplex virus
- Epstein-Barr virus, herpes zoster virus (less common)
- Measles and rubella viruses

Allergic Response

- Seasonal pollens
- Environmental exposure

Predisposing Risk Factors

- Contact with another person who has conjunctivitis, other atopic (allergic) conditions, exposure to allergens, or exposure to an STI.

Physical Assessment

Examination should be very brief in the case of a chemical injury to the eye as irrigation of the eye is priority and should begin immediately. A topical anesthetic, e.g., tetracaine, may be used if the examination is uncomfortable for the patient.

- Visual acuity
- Inspect both eyes for symmetry
- Inspect eyelids and orbits for crusting, edema, ulceration, nodules, discoloration, inversion of eyelashes, papillary reaction
- Inspect the conjunctiva for erythema, edema, discharge, foreign bodies, phlyctenules (white granules on corneal edge surrounded by erythema) or other abnormalities
- Note the pattern of injection, such as conjunctival hemorrhage or ciliary flush
- Pupils equal, round, reactive to light and accommodation (PERRLA)
- Examine the anterior segment of the globe with a small penlight
- Inspect ocular mobility by checking range of movement
- Use a fluorescein stain to assess for corneal abrasion or ulcers if history or physical findings suggest corneal abrasion. Corneal cells that are damaged or lost will stain green; cobalt blue light allows easier visualization of the abrasion.
- Palpate the bony orbit, eyebrows, lacrimal apparatus and pre-auricular lymph nodes for tenderness, swelling or masses
- Carefully document all evidence of external trauma

Additional Pediatric Considerations

- Weigh for medication calculations

Bacterial Infection – History

- Eye(s) red, often unilateral initially, may spread to both eyes
- Burning, gritty sensation or foreign body sensation in eyes
- Thick, purulent discharge with crusting
- Complicating bacterial infections, such as otitis media, may be evident
- Recent contact with others with similar symptoms
- Recent sexual activity and possible STI

Bacterial Infection – Common Findings

- Conjunctiva erythematous (unilateral or bilateral)
- Chemosis (swelling of conjunctiva) if severe
- Purulent discharge
- PERRLA
- Visual acuity normal
- Pre-auricular nodes palpable in *Neisseria gonorrhea*, Chlamydia, and MRSA

Viral Infection – History

- Acute onset of conjunctival injection commonly preceded by a viral upper respiratory tract infection
- May begin unilateral, but often bilateral within 24-48 hours
- No pain, mild to stabbing pain. possibly gritty sensation or mild itching
- Tearing or mucoid discharge
- Systemic symptoms may be present (e.g., sneezing, runny nose, sore throat, preauricular lymphadenopathy)
- Recent contact with others with similar symptoms

Viral Infection – Common Findings

- Conjunctiva erythematous (unilateral or bilateral)
- Chemosis and eyelid edema (swelling of conjunctiva due to non-specific irritation) if severe
- Watery or mucoid discharge
- PERRLA
- Visual acuity: normal
- Swollen eyelids
- Enlarged, tender preauricular nodes Lasts 1-4 days; infectious for 10-12 days from onset as long as the eyes are red
- Dendritic keratitis on fluorescein staining with herpes simplex virus

Note: Clinical factors cannot reliably differentiate viral from bacterial causes.

Allergic Response – History

- Seasonal, known, or environmental allergies, allergic rhinitis
- Eczema, asthma, urticaria
- Bilateral watery, red, itchy eyes, without purulent drainage

Allergic Response – Common Findings

- Sequential bilateral red eyes

- Watery discharge and inflammation around the eye and eyelids, which can produce dramatic conjunctival swelling (chemosis) and lid edema, to the extent that the eye is swollen shut
- A feeling of grittiness or stabbing pain
- May have rhinorrhea or other respiratory symptoms
- Crusting of the lashes overnight can sometimes be confused for a purulent discharge
- Enlarged, tender pre-auricular lymph nodes are often present/a useful feature to assist diagnosis
- PERRLA
- Visual acuity: normal

Note: Review Appendix for: Algorithm for diagnosing the cause of red eye.

Diagnostic Tests

The RN(C) may consider the following diagnostic tests in the examination of the eye to support clinical decision-making:

- Specimens should be obtained for culture and smear if inflammation is severe, in chronic or recurrent infections, with atypical conjunctival reactions, and with failure to respond to treatment.
- Swab drainage for Culture and Sensitivity (C&S) only if there is no resolution of symptoms after an empiric course of treatment.
- Swab for gonorrhea or chlamydia.

References

More recent editions of any of the items in the References List may have been published since this DST was published. If you have a newer version, please use it.

- Ahmed, F., Feldman, H. House, R. MDc, 2015 [Corneal Abrasions and Corneal Foreign Bodies](#). American Academy of Ophthalmology. (2012). [Corneal Abrasion](#)
- American Academy of Ophthalmology. (2014). [Policy statement: Guidelines for appropriate referral of persons with possible eye diseases or injury](#).
- American Academy of Ophthalmology. (2015). Comprehensive Adult Medical Eye Evaluation
- American Optometric Association. (2017). [Comprehensive eye and vision examination](#). *American Optometric Association*.
- Anti-Infective Review Panel. (2013). *Anti-infective guidelines for community-acquired infections*. Toronto, ON: MUMS Guideline Clearinghouse.
- Azari, A. A., & Barney, N. P. (2013). Conjunctivitis: A systematic review of diagnosis and treatment. *JAMA: Journal of the American Medical Association*, 310(16), 1721-1729.
- Ball, J. W., Dains, J. E., Flynn, J. A., Solomon, B. S., & Stewart, R. W. (Eds.). (2015). *Seidel's guide to physical examination* (8th ed.). St. Louis, MO: Elsevier.
- Bashour, M. (2014, March 5). *Corneal foreign body*. Retrieved from <http://emedicine.medscape.com/article/1195581-overview>
- Blondel-Hill, E., & Fryters, S. (2012). *Bugs and drugs: An antimicrobial infectious diseases reference*. Edmonton, AB: Alberta Health Services
- Boyd, K. (2017). [Cataract diagnosis](#). *American Academy of Ophthalmology*.
- Boyd, K. (2017). [Glaucoma](#). *American Academy of Ophthalmology*.
- Boyd, K. (2016). [What you should know about swimming and your eyes](#). *American Academy of Ophthalmology*. doi:10.1186/ar96
- Bremond-Gignac, F. Chiambaretta, S. Milazzo. *A European Perspective on Topical Ophthalmic Antibiotics: Current and Evolving Options*. *Ophthalmol Eye Dis*. 2011:29.
- Canadian Association of Optometrists. (2017). [What is a comprehensive eye exam?](#) *Canadian Association of Optometrists*.
- Canadian Pharmacists Association. (2014). *Therapeutic Choices* (7th ed.). Ottawa, ON: Author
- Canadian Pharmacists Association. (2014). *Therapeutic choices for minor ailments*. Ottawa, ON: Author.
- Canadian Pharmacists Association. (2010). E-CPS.
- Cash, J. C., & Glass, C. A. (Eds.). (2014). *Family practice guidelines* (3rd ed.). New York, NY: Springer.
- Chan, P. D., & Johnson, M. T. (2010). *Treatment guidelines for medicine and primary care*. Blue Jay, CA: Current Clinical Strategies Publishing.

- Chen, Y. A., & Tran, C. (Eds.). (2011). *The Toronto notes 2011: Comprehensive medical reference and review for the Medical Council of Canada Qualifying Exam Part 1 and the United States Medical Licensing Exam Step 2* (27th ed.). Toronto, ON: Toronto Notes for Medical Students.
- Cleary, G., Nischal, K. K., & Jones, C. a. (2006). Penetrating orbital trauma by stiletto causing complex cranial neuropathies. *Emergency medicine journal: EMJ*, 23(4), e28.
- Council of Canadian Academics. *Improving Medicines for Children in Canada*. Ottawa: 2014.
- Cronau, H., Kankanala, R. R., & Mauger, T. (2010). [Diagnosis and management of red eye in primary care](#). *American Family Physician*, 81(2), 137-144.
- Dains, J. E., Baumann, L. C., & Scheibel, P. (2012). *Advanced health assessment and clinical diagnosis in primary care* (4th ed.). St. Louis, MO: Elsevier Mosby.
- DynaMed. (2015, July 31). *Allergic conjunctivitis*.
- DynaMed. (2015, December 21). *Corneal Abrasion*
- DynaMed. (2015, June 9). *Infectious conjunctivitis*
- Estes, M. E. Z. (2014). *Health assessment and physical examination* (5th ed.). Clifton Park, NY: Cengage Learning.
- Epling, J. (2010). [Bacterial conjunctivitis](#). *American Family Physician*, 82(6), 665-666.
- Esau, R. (Ed.). (2012). *British Columbia's Children's Hospital pediatric drug dosage guidelines* (6th ed.). Vancouver, BC: Children's & Women's Health Centre of B.C.
- Everitt, H. A., & Little, P. S. (2006). [A randomized controlled trial of management strategies for acute infective conjunctivitis in general practice](#). *British Medical Journal*, 333(321). doi: 10.1136/bmj.38891.551088.7C.
- Eye Physicians & Surgeons of Ontario. (2017). [Vision Safety](#). *Canadian Ophthalmological Society*.
- Fraenkel A, Lee LR, Lee GA. [Managing corneal foreign bodies in office-based general practice](#) ` T. 2017;46(3):89-94.
- Friedlaender, M. H. (2011). Ocular allergy. *Current Opinion in Allergy and Clinical Immunology*, 11(5), 477-482.
- Gold, R.S. (2011). Treatment of bacterial conjunctivitis in children. *Pediatric Annals*, 40(2), 95-105.
- Golde, K. T., & Gardiner, M. F. (2011). Bacterial conjunctivitis in children: A current review of pathogens and treatment. *International Ophthalmology Clinics*, 51(4), 85-92.
- Infective conjunctivitis. (2011, September 5). *Independent Nurse*, 29-30.
- Jacobs, D. S. (2015). [Conjunctivitis](#). *UpToDate*.
- Jacobs, D. S. (2014). [Corneal abrasions and corneal foreign bodies: Clinical manifestations and diagnosis](#). *UpToDate*.
- Jacobs, D. S. (2015). [Corneal abrasions and corneal foreign bodies: Management](#). *UpToDate*.
- Jefferis, J., Perera, R., Everitt, H., van Weert, H., Rietveld, R., Glasziou, P., & Rose, P. (2011). [Acute infective conjunctivitis in primary care: Who needs antibiotics? An individual patient data meta-analysis](#). *British Journal of General Practice*, 61(590), e542-e548.

- Karpecki, P., Paterno, M., & Comstock, T. (2010). Limitations of current antibiotics for the treatment of bacterial conjunctivitis. *Optometry and Vision Science: Official publication of the American Academy of Optometry*, 87(11), 908-919.
- Klostranec, J. M., & Kolin, D. L. (2012). *The Toronto notes 2012: Comprehensive medical reference and review for the Medical Council of Canada Qualifying Exam Part 1 and the United States Medical Licensing Exam Step 2* (28th ed.). Toronto, ON: Toronto Notes for Medical Students.
- La Roche, R., Hamilton J. [Vision screening in infants, children and youth](#). *Paediatr Child Heal*. 2009;14(4):246-248. Retrieved from. La Rosa, M., Lionetti, E.,
- Lexicomp Online. Polymxcin, Sulfacetamide etc.. Retrieved from <http://online.lexi.com>
- New Zealand Medicines and Medical Devices Safety Authority. (2008). *Minims tetracaine hydrochloride*.
- Mitchell L, Grimmer P. [Complications & treatment of a red eye](#). *Bpj*. 2013;54(54):8-21.
- Mukherjee P, Sivakumar A. Tetanus prophylaxis in superficial corneal abrasions. *Emerg Med J*. 2003;20(1):62-64.
- O'Brien, T. P. (2013). Allergic conjunctivitis: An update on diagnosis and management. *Current Opinion in Allergy & Clinical Immunology*, 13(5), 543-549.
- O'Brien TP, Jeng BH, McDonald M, Raizman MB. Acute conjunctivitis: truth and misconceptions. *Curr Med Res Opin*. 2009;25(8):1953-1961. doi:10.1185/03007990903038269.
- Peyman GA, Rahimy MH, Fernandes ML. Effects of morphine on corneal sensitivity and epithelial wound healing: implications for topical ophthalmic analgesia. *Br J Ophthalmol*. 1994 Feb. 78(2):138-41
- Pichichero, M. (2011). Bacterial conjunctivitis in children: Antibacterial treatment options in an era of increasing drug resistance. *Clinical Pediatrics*, 50 (1), 7-13.
- Porter, R. S., & Kaplan, J. L. (Eds.). (2011). Approach to the ophthalmologic patient. In *The Merck Manual* (19th ed.). Whitehouse Station, NJ: Merck Sharpe & Dome Corporation.
- Porter, R. S., & Kaplan, J. L. (2011). Eye Disorders. In *The Merck Manual* (19th ed). Whitehouse Station, NJ: Merck Sharpe & Dohme Corp.
- Rosario, N., & Bielory, L. (2011). Epidemiology of allergic conjunctivitis. *Current Opinion in Allergy & Clinical Immunology*, 11(5), 471-476.
- Sawyer, S. S. (2012). *Pediatric physical examination and health assessment*. Sudbury, MA: Jones & Bartlett Learning
- Seth, D., & Khan, F. I. (2011). Causes and management of red eye in pediatric ophthalmology. *Current Allergy and Asthma Reports*, 11(3), 212-219.
- Scott, I. MD M. Viral conjunctivitis_ practice essentials, background, etiology medscape April 2017. 2017. <http://emedicine.medscape.com/article/1191370-overview>.
- Stephen, T. C., Skillen, D. L., Day, R. A., & Bickley L. S. (2010). *Canadian Bates' guide to health assessment for nurses*. Philadelphia, PA: Lippincott, Williams & Wilkins.
- Sheikh, A., Hurwitz, B., van Schayck, C. P., McLean, S., & Nurmatov, U. (2012). Antibiotics versus placebo for acute bacterial conjunctivitis (review). *Cochrane Database of Systematic Reviews*, (9).

Shin H, Price K, Albert L, Dodick J, Park L, Dominguez-bello G. Changes in the eye microbiota associated with contact lens wearing. 2016;7(2):1-6. doi:10.1128/mBio.00198-16.

Spering, K. A. (2011). Therapeutic strategies for bacterial conjunctivitis. *Clinical Advise Nurse Practitioners*, 14(8), 31-40.

Thanathanee, O., & O'Brien, T. (2011). Conjunctivitis: Systematic approach to diagnosis and therapy. *Current Infectious Disease Reports*, 13(2), 141-148. Visscher, K. L., Hutnik, C. M. L., & Thomas, M. (2009). [Evidence-based treatment of acute infective conjunctivitis: Breaking the cycle of antibiotic prescribing](#). *Canadian Family Physician*, 55(11), 1071-1075.

Verma, A. (2014, February 20). [Corneal abrasion](#).

Visscher, K. L., Hutnik, C. M. L., & Thomas, M. (2009). [Evidence-based treatment of acute infective conjunctivitis: Breaking the cycle of antibiotic prescribing](#). *Canadian Family Physician*, 55(11), 1071-1075.

Waldo, M. H. (Ed.). (2011). *Ophthalmic procedures in the office and clinic* (3rd ed.). San Francisco, CA: American Society of Ophthalmic Registered Nurses.

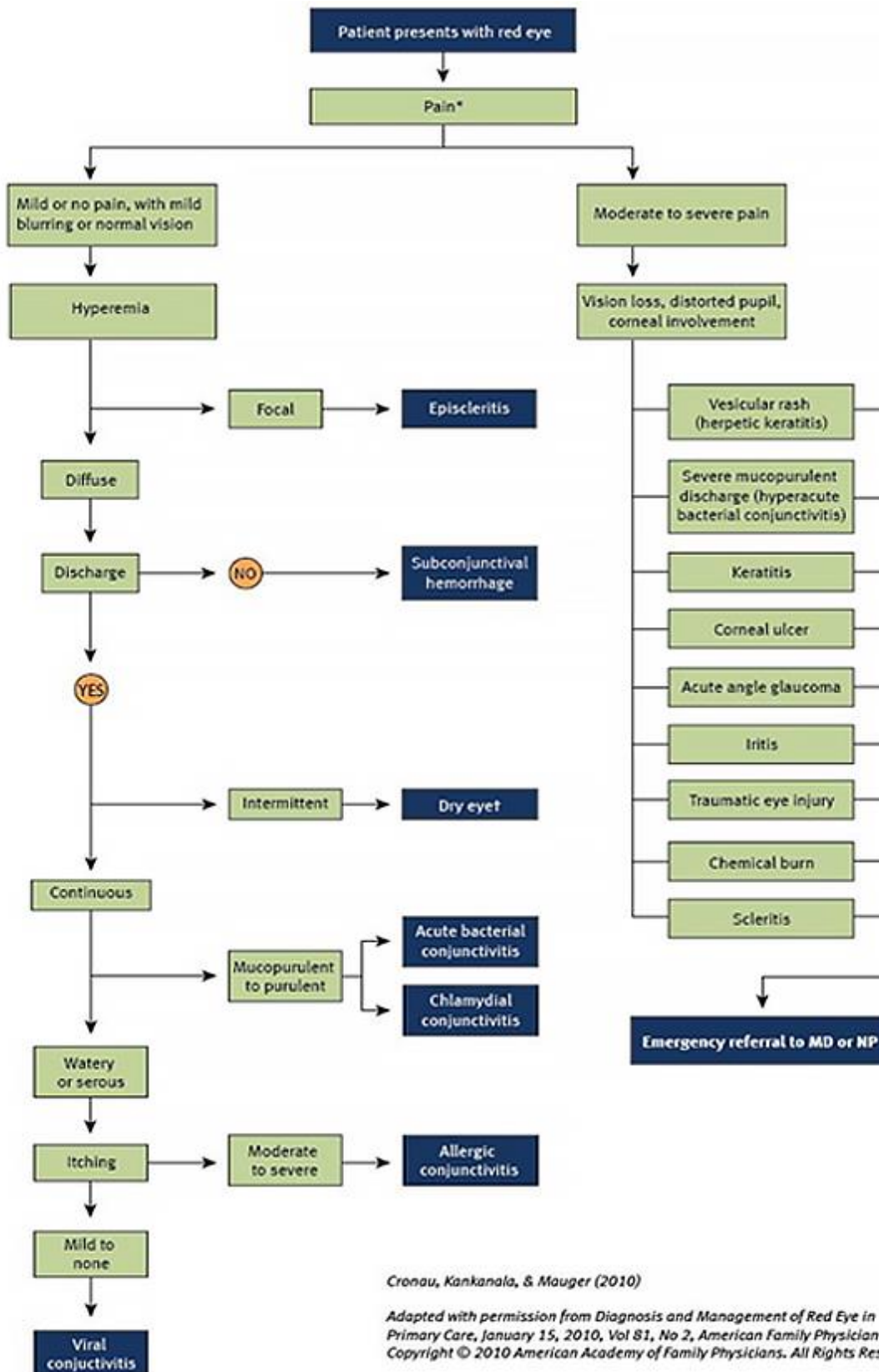
Wipperman, J. L., & Dorsch, J. N. (2013, January 15). [Evaluation and management of corneal abrasions](#). *American Family Physician*, 87(2), 114-120.

WHO. [Protection Against Exposure to Ultraviolet Radiation](#) | World Health Organization. *World Heal Organ*. 1994

Zoric, L. & Stojcic, M. (2013). The influence of ultraviolet radiation on eye. *Primary Health Care* 3: 133. doi:10.4172/2167-1079.1000133

Appendix A

Algorithm for Diagnosing the Cause of Red Eye



NOTE:
Blepharitis, hordeolum, and chalazion are associated with localized red, swollen, tender eyelid; other symptoms are rare.

* -- patients with corneal abrasion may present with severe pain, but treated by a primary care physician.

† -- Paradoxical tearing of the eye.