

DST-104 Corneal Abrasion (Minor): Pediatric

DEFINITION

A superficial corneal defect due to scraping or rubbing of the corneal epithelium.

Corneal abrasions occur in any situation that causes epithelial compromise.

Nurses with Remote Practice Certified Practice designation (RN(C)s) are able to treat children with corneal abrasions who are **2 years of age and older**.

POTENTIAL CAUSES

Usually trauma or foreign body in the eye

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

TYPICAL FINDINGS OF CORNEAL ABRASION

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 Contact lens wearing

Physical Assessment

- Vital signs normal
- Weigh for medication calculations
- 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 react briskly to light
- 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.

Diagnostic Tests

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

MANAGEMENT AND INTERVENTION

Goals of Treatment

- Preserve vision

- Prevent secondary bacterial infection
- Prevent development of corneal ulceration
- Pain management

Non-pharmacologic Intervention

- Copious irrigation with saline for any foreign body to promote removal
- Do not use contact lens until healed and antibiotic treatment is finished.
- Patching is contraindicated unless advised by a physician or nurse practitioner.

Pharmacologic Interventions

- Weight required for all drug calculations.
- Pediatric doses should not exceed recommended adult doses.
- Instill topical anesthetic eye drop:
- tetracaine 0.5% eye solution (Pontocaine) 2 drops stat dose only

Note: The client should not be discharged with topical anesthetics for pain control as they can be toxic to the epithelium and retard healing, increasing the risk of infections and scarring.

- Complaints of irritation and foreign-body sensation should resolve in 1 or 2 minutes
- Instill a generous amount of eye lubrication in the lower conjunctival sac.
- Analgesics for mild to moderate pain:
 - acetaminophen
 - ibuprofen

Note: Corneal abrasions should never be treated with topical steroids as they slow healing and increase the risk of superinfection.

Note: Tetanus prophylaxis is not recommended unless there is a penetrating injury into the eye, chemical burn, devitalized tissue, or trauma from contaminated material.

Pregnant Women (dosing as above)

- Eye lubricant and acetaminophen are safe in pregnancy.
- Tetracaine may be used after consulting a physician or nurse practitioner.
- DO NOT USE ibuprofen.

Breastfeeding Women (same dosing as above)

- Eye lubricant and acetaminophen may be used as listed above
- Tetracaine may be used after consulting a physician or nurse practitioner
- Ibuprofen may be used after consulting a physician or nurse practitioner.

POTENTIAL COMPLICATIONS

- Corneal ulceration
- Secondary bacterial infection
- Corneal scarring if abrasion recurs
- Uveitis
- Iritis

CLIENT/CAREGIVER EDUCATION AND DISCHARGE INFORMATION

- Advise on condition, timeline of treatment and expected course of disease process.
- Advise client that daily follow-up is important to ensure proper healing.
- Counsel client about appropriate use of medications (type, dose, frequency, side effects).
- Counsel client/guardian about when to return to work or school.
- Instruct client to return to clinic immediately if pain increases, if vision decreases before 24-hour follow-up, and if any signs of infection appear including swelling, discharge, or increased redness. Client should return if there are changes such as flashes of light, floaters, a dark veil or vision loss.
- Suggest that client wear protective glasses while working or participating in contact sports to help prevent similar incidents in future.
- If contact lens wearer, do not wear contact lens until healed.

MONITORING AND FOLLOW-UP

- Advise caregiver to follow-up if condition does not improve, deteriorates and for on-going monitoring as necessary. Follow-up at 24 hours to assess healing is imperative.
- Daily visual acuity test until recovered.
- If no symptoms or signs, client can be sent home with advice on preventing corneal abrasions.
- If client is still symptomatic but improving the eye should be re-treated as above with antibiotic ointment or drops and re-examined daily with fluorescein. The uptake of dye should be less than on the previous day. Re-examine daily until the abrasion has healed completely.

CONSULTATION AND/OR REFERRAL

Consult a physician or nurse practitioner if:

- child is under the age of 2 years.
- The abrasion is greater than 4 mm
- The abrasion is located in center of the cornea.
- a penetrating corneal ulcer is found on initial examination,
- pain is severe,
- pupils are not round,
- the abrasion is larger after 24 hours,
- a residual rust ring is evident, or
- there is significant worsening of vision.
- Referral to an optometrist, nurse practitioner or physician is required within 24 hours for large or central defects and in 48-72 hours if there is no response to therapy

REFERENCES

More recent editions of any of the items in the Reference 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](#) (Safee requested to provide full test article Aug. 3rd) American Academy of Ophthalmology. (2012). *Corneal Abrasion*.
- Bashour, M. (2014, March 5). [Corneal foreign body](#).
- Canadian Pharmacists Association. (2014). *Compendium of Therapeutic Choices* (7th ed.). 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.
- Cronau, H., Kankanala, R. R., & Mauger, T. (2010). [Diagnosis and management of red eye in primary care](#). *American Family Physician*, *81*(2), 137-144.
- DynaMed. (2015, December 21). *Corneal Abrasion*.
- Fraenkel A, Lee LR, Lee GA. [Managing corneal foreign bodies in office-based general practice](#) ` T. 2017;46(3):89-94.
- Jacobs, D. S. (2015). [Corneal abrasions and corneal foreign bodies: Management](#). *UptoDate*. Retrieved from
- Klostranec, J. M., & Kolin, D. L. (2012). The Toronto notes 2012: Comprehensive medical reference & review for Medical Council of Canada Qualifying Exam Part 1 and the United States Medical Licesnsing Exam Step 2 (28th ed.). Toronto, ON: Toronto Notes for Medical Students.
- 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.
- New Zealand Medicines and Medical Devices Safety Authority. (2008). [Minims tetracaine hydrochloride](#).
- 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.
- Porter, R. S., & Kaplan, J. L. (2011). Eye Disorders. In *The Merck Manual* (19th ed). Whitehouse Station, NJ: Merck Sharpe & Dohme Corp.
- Verma, A. (2014, February 20). [Corneal abrasion](#).
- Verma A. (2015, Decemer 15) [Corneal abrasion differential diagnoses](#).
- 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.