MISSION Children's Hospital | MISSION HEALTH PARTNERS

CO-MANAGEMENT GUIDE

Pediatric Neurology / Sports Medicine Concussion Specialist	Concussion

Background	A complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces caused by direct blow to head, face, neck or indirect blow to the body. Acute impairment results in temporary changes of neurologic function rather than structural injury. Traumatic brain injury leads to a spectrum of symptoms, with or without loss of consciousness, with resolution of symptoms following a sequential course.
Initial Evaluation	For concussion resources, refer to Mission Children's Toolbox: http://www.mission-health.org/documents_links.php Also: http://www.cdc.gov/headsup/pdf/providers/ace_v2-a.pdf (Acute Concussion Evaluation-Physician/Clinician Office Version) **Pertinent History:** Obtain pertinent information thorough history including signs and symptoms of injury, with or without loss of consciousness and any previous head or neck injuries. Include headache, nausea, vomiting, balance or visual problems, fatigue, sensitivity to light or sound or sleep disturbances. **Pertinent Physical Exam:** Vital signs. Complete a head and neck examination with funduscopic exam and extraocular movements. Neurological exam including gait and balance exam (Romberg test and tandem gait), deep tendon reflexes. Assess cognitive, emotional and sleep function.
Initial Management	Refer to Mission Children's Toolbox: "Concussion – Return to Learn, Play" **Asymptomatic or minimal symptoms:** personal and school modifications to include physical rest (no running, biking, lifting, etc) and cognitive rest (no school work, video games, etc). Continue to monitor signs and symptoms. Refer to the Gfeller Waller concussion packet: http://gfellerwallerlaw.unc.edu/GfellerWallerLaw/gwlaw.html **Headache**- Acetaminophen or NSAIDs short term use. Patients with prior h/o migraine headache may develop a migraine triggered by head injury. No NSAIDs for the first 24 hours. **Nausea**- Ondansetron for 1-2 days after concussion, if needed **Sleep Disturbance**- Ensure proper sleep hygiene for signs of daytime drowsiness, difficulty falling asleep and difficulty staying asleep. Melatonin (1-3 mg in older children and 1-5 mg in adolescents). Do not wake patients up from sleep if they are tired.
Pre-Visit Work Up	Medical record to include office visit H&P, lab results, medication list to include OTC and prescriptions medication if possible, prior to visit.

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When to Refer	**Emergency Room:** • Glasgow Coma score less than 15 • Deteriorating mental status • potential spinal injury • progressive, worsening symptoms or new neurologic signs • persistent vomiting	• evidence of skull fracture • post traumatic seizures • Coagulopathy • History of neurosurgery (eg Shunt) • multiple injuries
	Pediatric Neurologist/Sports Medicine Concussion Specialist: • Continuation of symptoms greater than 3-4 weeks • abnormal neurological exam • symptoms worsened by cognitive effort such as reading, video games or screen time or • increased missed school days • prolonged headache	• sleep disturbances not controlled with Melatonin • repeated vomiting • increasing confusion or irritability • patients with multiple concussions with more intense symptoms and/or greater cognitive dysfunction • uncertain diagnosis of concussion
Co-management Strategy (as appropriate)	**Specialist scope of care:** Additional testing, treatment until stabilized.	**Primary care scope of care:** Support patient per specialist plan.
Return to Primary Care Endpoint	Care to be transferred back to Primary Care provider once stabilized.	
Guidelines Referenced	Acute Concussion Evaluation (ACE), Physician/Clinician Office Version. Retrieved from http://www.cdc.gov/headsup/pdf/providers/ace_v2-2a.pdf Clinical report-sport related concussion in children and adolescents. Halstead, M.E. & Walter, K.D. (2010). American Academy of Pediatrics. Retrieved from http:/pediatrics.aappublications.org/content/126/3/597 Pediatric sports specific return to play guidelines following concussion. May, Keith H.,et al. (2014). Int J Sports Ther. Apr: 9(2): 242-255 Concussion in children and adolescents: management. Meehan, W.P & O'Brien, M.J. (2017). UpToDate. Retrieved from: http://www.uptodate.com/contents/concussion-in-children-and-adolescents-management Fenchel's clinical pediatric neurology. Pina-Garza, E. (2013). London:Elsevier Saunders. Concussion: evidence-based blueprint for success. Vaughan, A. (2014, July 16) Retrieved from MAHEC Pediatric Grand Rounds	