In the past decade, concussion rates in pediatrics have increased more than 4-fold. 25% of these concussions are sports-related. Without proper treatment, post-concussive syndrome can occur. Concussons are accumulative and have been associated with chronic encephalopathy. Limited information pertaining to concussion treatment in the pediatric population.

**METHODS**

- Conducted a systematic review of the literature following the Preferred Reporting Items for Systemic Review and Meta-Analysis (PRISMA) guidelines.
- In consultation with a research librarian, PubMed and SCOPUS were explored using the following search terms and derivatives:
  - Early intervention, concussion, traumatic brain injury, child, youth, pediatric, sports, sports medicine, football, soccer.

**RESULTS**

Four key papers are summarized below:


- Eye tracking assessment of concussed patient compared to healthy control.
- Cross-sectional, multisite study on child athletes (median age = 14.1 +/- 2.1 years).
- Right eye skew noted on exam within 10 days post-concussion.
- Noting physiological changes key to providing early intervention.
  - Objective methods needed to assist clinicians to identify.

**Vestibular Rehabilitation Is Associated With Visuovestibular Improvement in Pediatric Concussion** - Storey, et al. (2018)

- Vision and vestibular-related dysfunctions are associated with prolonged recovery in children.
- Retrospective cohort of children diagnosed with concussion (median age = 11.8 +/- 3.1 years; 59 males and 50 females).
- Vestibular rehabilitation customized to child’s impairments (i.e. dizziness, balance, gait disturbances, and visual deficits).
- Children who completed at least 2 visits showed improvements in post-concussion symptoms.
- First study to indicate that younger, preadolescent children benefit from vestibular therapy.


- Headache management treated by neurologist, as opposed to emergency room clinicians.
  - Treatment with rest, analgesics, and sleep aids.
  - Prospective cohort study on children with concussion (median age = 14.1 years; 15 males and 29 females).
  - 64% success rate in decreasing post-concussive symptoms with use of medication intervention.
  - 45% complete resolution of headache.


- Cognitive and physical rest following the return-to-school/return-to-play guidelines for one week.
- Retrospective analysis of children diagnosed with a sports-related concussion (median age = 15 years; 33 males and 16 females).
- Children prescribed at least one week of cognitive and physical rest following injury.
- Improved scores on ImpACT.
  - Neurocognitive assessment to determine if child is ready to return-to-school and return-to-play.

**DISCUSSION**

- Vestibular rehabilitation started at initial evaluation reduced long-term concussion effects.
- Improved balance (Balance Error Scoring System - compare first and final visit).
- Improved right eye tracking.
- Lack of “standard of care” in pediatric population.

**LIMITATIONS**

- Literature review performed by one reviewer.
- Only two databases utilized.
- Article selection limited due to nature of study.