The Role of Physical Therapy in Post Concussion Management.

Cook Children’s Sports Medicine Symposium
Ryan Blankenship, PT, SCS

Non-Disclosure

• No conflicts of interest.
Course Objectives

- Participants will be able to perform Vestibular Ocular Reflex testing to help identify students with Vestibular dysfunction after concussion.
- Participants will be able to describe tests to assess visual function after concussion.
- Participants will be able to demonstrate 2 basic vestibular rehab exercises and give 2 ways of progressing those exercises.

Symptoms of Concussion: General.

- Headaches
- Dizziness
- Nausea/Vomiting
- Fatigue
- Sleep Disturbance
- Irritability
What Role Does Physical Therapy play in Concussion Management?

Management of headaches

Management of visual issues

Management of vestibular issues

Physical Therapy and Headache Management

✓ Try to determine cause of the headache.
✓ When do the headaches start?
✓ Are there certain triggers?
✓ Is the patient having neck pain with the headaches?
✓ Are the headaches related to exertion (Dysautonomia)
Cervicogenic headaches

- Typically start at the end of the day
- Are usually posture related
- Start at the back of the skull and come forward
- Typically have some segmental dysfunction related to them.


Treatment of Cervical Headaches

- Posture correction
- Stretching
- Manual segmental mobilizations
What Role Does Physical Therapy play in Concussion Management?

Management of headaches

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How do we help Vestibular issues or “dizziness”?

• What kind of “dizziness” is the patient having?
  ✓ Are they feeling unsteady or off balance?
    ✓ Disequilibrium
  ✓ Are they feeling woozy or faint?
    ✓ Lightheadedness
  ✓ Do they feel like the room is spinning?
    ✓ Vertigo
  ✓ Do they report the perception of movement in stationary objects?
    ✓ Oscillopsia
Why do concussions cause dizziness?

- Cause is often Multifactorial:
  - Peripheral:
    - BPPV
    - Damage to inner ear
  - Central:
    - Difficulty with gaze stabilization and integration of visual/vestibular systems.
    - Changes in oculomotor function including convergence, accommodation, and pursuit/saccades.

Vestibular system and balance

- Semicircular canals detect rotational movements
- Saccule and Utricle detect linear movements.
  - Otoconia crystals get displaced during linear acceleration, which in turn deflects hair cells and produces a sensory signal.
  - Utricle detects “front and back” movement
  - Saccule detects “up/down” movement.
Testing for Vestibular dysfunction

- BPPV (Dix-Hallpike maneuver)
- VOR (Vestibulo-Ocular Reflex)
- DVA (Dynamic Visual Acuity)
- BESS (Balance Error Scoring System)

Dix-Hallpike Maneuver

Vestibulo-ocular reflex

Dynamic Visual Acuity Test

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Treating Vestibular Dysfunction

✓ Gaze Stabilization Exercises
✓ Balance and Posture Exercises
✓ Canalith Repositioning as needed (for BPPV)
Gaze stabilization exercises

- VOR 1: Gaze stabilization on a fixed target
- VOR2: Gaze stable on moving target moving in the opposite direction of head movement.
- Progress from a stable surface to an unstable surface.
- Progress from static position to performing the exercises while walking.

Balance and Posture Exercises

- Tandem stance (eyes open, eyes closed)
- Tandem stance compliant surface (eyes open, eyes closed)
- Single leg stance (eyes open, eyes closed)
- Single leg stance compliant surface (eyes open, eyes, closed)
- Dynamic exercises walking with head movement as someone throws a ball to you.
What Role Does Physical Therapy play in Concussion Management?

Management of headaches
Management of visual issues
Management of vestibular issues

Visual Symptoms

Reading text that is double can be very confusing. The letters overlap, words run together, and sometimes the words appear to swim on the page. No one should have to suffer with double vision!

Visual Symptoms: Ocular Motor Complaints

✓ Losing place when reading
✓ Skipping lines or words
✓ Letters “jump around” on the page
✓ Difficulty following moving objects
✓ Difficulty focusing from one task to another
✓ Eyes burning or watering

Specific Visual impairments and concussion: What do we test?

✓ Saccades
✓ Pursuits
✓ Near point convergence
Testing Saccades

- Look from one target to another on command
- Test in 3 fields (superior, middle, and inferior)
- King Devick Test

King Devick Test

Pursuits Testing

- Follow target
- Move in “H”, “X”, and “O” patterns

Testing Vergence

- Convergence
  - Break Point 2-4 inches
- Divergence
  - Recovery Point 6-8 inches
Treating visual dysfunction: Exercises for smooth pursuits

- Follow the flashlight or laser pointer.
- Pass ball back and forth from hand to hand.
- Tracing on dry erase board.
- As exercises get easier incorporate balance challenges with exercises.

Treating visual dysfunction: Exercises for saccades

- Moving from one target to another and tapping the target.
- Numbered post it notes on wall.
- Sorting lettered blocks.
- Hart Charts.
Hart Chart: Exercise for saccades

Treating visual dysfunction:
Exercises for accommodation

✓ Using Hart chart near and far
✓ Identifying numbers on targets moving towards and away from patient
Treating visual dysfunction: Exercises for convergence

✓ Use activities that are bilateral and emphasize crossing midline.
✓ Clapping hands together
✓ Fingertips together
✓ Golf tee into straw exercise

What Role Does Physical Therapy play in Concussion Management?

Management of headaches
Management of visual issues
Management of vestibular issues
How Much is Enough?

References


• Finn, Christina, MS, OTR/L. Post Concussion Syndrome Assessment and Treatment. Education Resources, Inc.


References continued