

# Primitive Reflex Integration for Concussion — A New Use for an Old Technique

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## Learning Objectives

- Demonstrate intermediate-level knowledge of primitive reflexes and their role in the concussed population
- Demonstrate a functional understanding of vertical integration and the impact disruption can cause
- Provide accurate and effective patient education for rehab purpose and home exercise program instruction
- Effectively perform and interpret results from the Primitive Reflex Screening Tool
- Effectively implement the Primitive Reflex Integration treatment protocol



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## Case Study – Protracted Recovery

13yo female: Concussion s LOC while ice skating

- Reports required (A) to exit ice – off balance, unable to walk (I). Immediate HA. Immediate nausea – no emesis.
- Disoriented – Unable to recall names of people she was with.
- Did not seek immediate medical attn – went home family friends worked in search & rescue dx c concussion advised rest.
- 2 weeks of traditional cspine PT – no improvement
- Concussion MD specialist referred to PT specialty clinic – 31 days post injury

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## Presentation

### Pmhx:

Denies sig hx. Healthy, active female.  
Competitive dancer.  
Does well in school – no hx of attn/concentration deficits, difficulty with reading/studying.

### Functional Deficits:

- School: decr tolerance – requires breaks. Unable to attend full day – goes late to sleep in, nap in the afternoon, leaves early.
- Reading: decr tolerance – incr sx after 2 min.
- Activity: Limited recreational activity, poor tolerance to ADLs, not cleared for sports/contact activity.



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# Symptoms

Concentration: reports incr difficulty c tasks requiring attn, incr diff focus in school, incr time to complete tasks

Mood changes: incr irritability, incr fighting with siblings,

Sleep: incr fatigue, diff falling asleep – uses audiobooks and melatonin

Sensitivity to loud noises – reports needing to wear ear plugs when present at dance class (for movement and stretching only).

- HA: incr c fatigue, reading/close tasks, crowded environments
- Visual Changes:
  - Blurry vision c reading & over stimulated, interm diplopia c reading
  - Myopia – d/c glasses in school “don’t want to feel like I have to read the board.”
  - Reading – lose place, skips lines, has to re-read to retain
- Dizziness: incr c walking, washing hair, quick movements of head



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# Evaluation

## Initial treatment:

- Comprehensive vision and vestibular eval performed per clinic protocol
  - VOMs if necessary
- + L posterior canal BPPV
- Mod-severe deficits of saccades, pursuits, accommodation/vergences.
- Moderate deficits of central and peripheral vestibular systems contributing to dizziness and impaired balance.



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## Plan/Treatment

### Education:

- Activity modification and school accommodations – including blue blockers

### Provided initial HEP for oculomotor control

- Pencil pursuits, saccades, push ups
- Line reading
- Pinwheel – monocular/binocular

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## Change in POC

### First follow up = improvement in BPPV

- Required 1 addt'l CRM for BPPV
- Significant difficulty with HEP – poor tolerance reported incr headaches

### Screened for PR disinhibition with new screening tool.

- Moro, ATNR, STNR, TLR, and galant
- D/c vision therapy and replaced with new PRI Level 1 exercises



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# Course of Treatment

For 3 weeks primary focus was PRI:

- Day 38: Visit #2 Started PRI, 1 week after IE
- Day 62: Visit #4 progressed to L2 ex. Progressed balance ex. Anti-suppression exercises, complex motor tasks
- Day 73: Visit #5 added low level vestibular habituation. Progressed balance. Progressed visuo-vestibular exercises.
- Day 80: Visit #6 Demonstrated full re-integration. Re-assessment: improved oculomotor control, reports improved tolerance to school and dance class
- Day 94: 63<sup>rd</sup> day of rehab. Discharged with (I) HEP address remaining deficits of vergences/VOR. Continue to habituate with dance classes

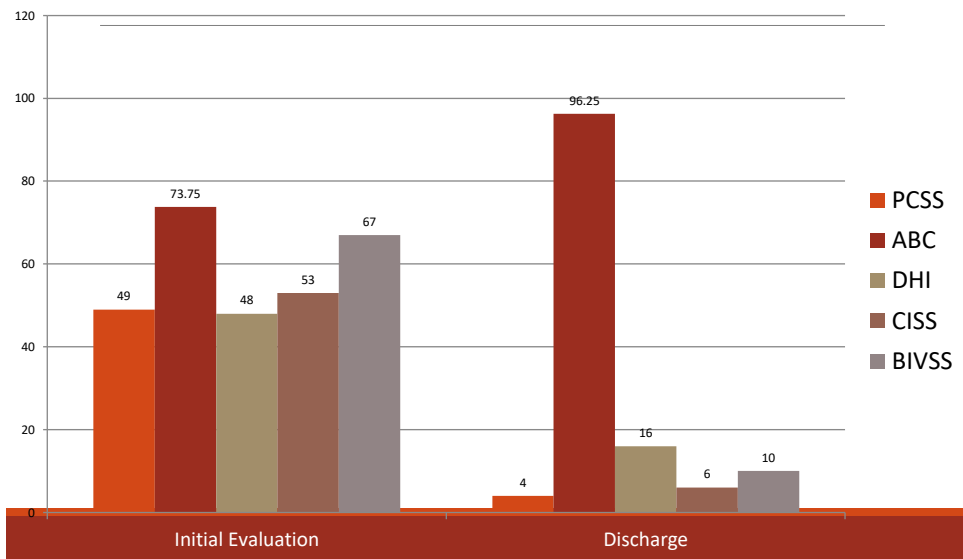
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# Outcome Measures



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## Outcomes Discussed

### Confounding variables:

- Low level oculomotor exercises, divided attn/complex motor tasks and balance ex are completed during in-office sessions.
- Significantly less emphasis placed on these ex than typical protocol until after reintegration of reflexes.
- HEP did not consist of oculomotor or vestibular exercises until after 3 weeks of PRI.
- Vestibular rehab was started at 5<sup>th</sup> week of therapy.
- Required an overall decreased dose of physical therapy than the typical patient treated with our VVR model
- 7 total visits including initial and final evaluation and returned to all activities faster than the typical patient seen in this clinic (63 days).

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## Case Study 2 – Chronic Injury/Complex Medical

50+ yo female – Concussion s LOC 2/2 skiing

- Hit head on tree limb.
- Reports immediate pain, especially in her neck.
- She reports symptoms of decr energy, incr headaches and dizziness.

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## Presentation

### Pmhx:

Denies sig medical hx on intake – wears bifocals  
Works full-time prior to injury

### Functional Deficits:

- Unable to work - limited to 1hr per day for class planning.
- Limited in computer and reading. Avoids stimulating environments 2/2 symptom provocation.
- Activity: Limited in household ambulation, ADLs – reports “need a break after doing the laundry or dishes”



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## Symptoms

Sleep: limited by anxiety impacting sleep – tightness in chest, racing heart – Rx from MD

Difficulties with conversational speech

Noise sensitivity: provokes HA, dizziness

- HA: “tingling” occiput
- Neck pain: treated with ortho PT
- Visual Changes:
  - “Visually overwhelmed” – provokes HA and dizziness
  - Poor tolerance to reading, computer.
  - “Not able to read but listening to audiobooks”
  - C/o “poor peripheral vision”
- Dizziness: incr c crowds, lights, noise and conversations.
- Tinnitus: interm and assoc c ear pain.



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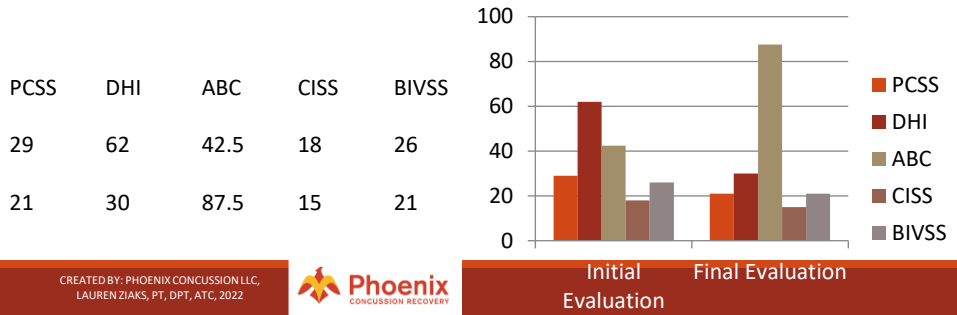
# Treatment Trajectory

Day 20: Initial Eval. Initiated HEP pursuits, saccades monocular/binocular

Day 36: Visit #3. Tolerated addition of brock string 2/2 mild deficits – endurance

Day 43: Visit #4. Tolerated addition of VORx1 ½ CPS

Day 85: Visit #8. Final evaluation – d/c therapy due plateau in symptoms – pt achieved clinical goals but continued symptoms. MD added zoloft and amitriptyline to control. Pt reports 85% of normal, back to work.



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## Return to PT

Dizziness: Minimal.

Vision: limited in computer use, reading. Continued “visually overwhelmed” in busy and loud environments – provokes HA and dizziness.

Fatigue: NRG still “very low compared to normal”

Sensitivity: Incr sensitivity to sound esp c incr fatigue.

Neck pain: persistent, incr c activity, associated with HA. Feels “tight” despite treatments with Chiropractor x 6 months. No stability exercises. Limits driving, ADLs, and work related activities.

Cognitive: Continued deficits with conversational speech.

Functional: Reports she was able to “make it through the rest of the school year” and is still doing her vision HEP.

- Reports if she stops the ex she immediately starts to go backwards and have incr eye pain and HA. Neuropsych believes these continued deficits are also related to suboc triangle

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## New POC

Day 321: Continued neck pain and headaches – neuropsychologist referred back to PT. Assessed cspine and new PRI therapy since pt was seen in VT/VRT clinic + Moro, TLR, ATNR, STNR reflexes upon exam. Pt interested in adding HEP.

Day 342: Pt reports can read “a lot longer than before starting PRI without doing her vision therapy exercises” Improved from 15mins→30-45mins. “Finally enjoying reading again.” “I don’t feel tired anymore after being on the computer and can use it as long as I want.” PT and pt decided to recommence VT/VRT after integration to improve endurance.

Day 356: 35<sup>th</sup> day of rehab. Re-integration. MD removed amitriptyline – HA and anxiety increased. Encouraged pt to contact MD. Caused interruption in therapy until stabilized medically.

Day 388: 67<sup>th</sup> day of rehab. Final evaluation. OD d/c prism lenses, d/c tinted lenses. Resolution of oculomotor deficits. Continued mild binocular vision deficits. VOR WFL. Continued balance deficits.

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Questions?

Thank you!

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How to get your CEUs?

Navigate to

[www.PhoenixConcussionRecovery.com](http://www.PhoenixConcussionRecovery.com)

→ “Provider Portal”

→ “Integrative Concussion Management Program”

At the bottom of the screen, click the button “I’ve Completed the Course”

Password:



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