

Concussion Management Algorithm

Determine if patient has a simple concussion, or post-concussive syndrome (PCS) defined in general as prolonged symptoms >4-6 weeks.

On average 10-14 days for a simple concussion to heal, but up to 4-6 weeks and even longer for pre teen age groups.

At minimum, for a mild concussion, patient will be out of sports for a week, as return to play protocol after full recovery from symptoms takes 5 days.

Beyond the 4-6 week window, we consider the patient to have transitioned to post-concussive syndrome. Consider that younger patients take longer to heal so they may be in the “normal” healing concussion range up to 6-8 weeks.

At the initial visit, ALL patients should be supplied with at least handouts on Concussion, School accommodation letter, concussion home care, and RTP protocol (for reference not clearance).

WHAT TO COVER WITH THE PATIENT

Symptoms/Home

Use patient/parent symptom checklist (intake form) to determine where deficits/symptoms exist in order to determine treatment plan. (Focus on top 3 or inter-related symptoms: sleep, fatigue, mood)

Discuss headache pain control with family (i.e. preventative trigger avoidance or using Tylenol PRN for headaches per Home Care Handout)

Discuss briefly importance of sleep, hydration, and nutrition during the healing process.

School

Every patient needs a school accommodation letter and should be provided with a “color zone” in which their accommodations best fit. These forms go to school.

Red Zone

Orange Zone

Yellow Zone

Green Zone

Blue Zone

If the patient has prolonged or severe cognitive deficits with school (i.e. at risk of dropping a class) initiate neuro cognitive testing. We do computerized testing with IMPACT in clinic to help determine if more comprehensive formal NP testing is needed.

Consider formal neuropsych (NP) testing referral to help develop a long-term academic 504 plan. Provide these patients with our list of NP testing locations/providers and an information sheet regarding NP testing with their formal referral.

It is also helpful to provide these patients with a handout on the AZ Brain Alliance so that they have an advocate to help them with 504/school planning as well as support groups.

Cognitive therapy and medical management may also be indicated in this group along with accommodations. Cognitive therapists require referral. Home therapy can be done on cognitive gym or luminosity. Occasionally Medications such as Ritalin or Concerta can be used for 4-6 week trial to help with attention and cognitive symptoms.

Activity

All patients in the acute window for concussion should be restricted from sports and all physical activity. OK to participate in those activities which DO NOT increase their heart rate (walk the dog, house chores, stretches). Patients should refrain from activities that require a dramatic change in posture.

All patients should have the activity portion of their school accommodations form filled out specifying no PE or sports.

Patients with symptoms should be considered for ACTIVE REHAB testing as an adjunct therapy to help heal their concussion as soon as 24-48 hours on a case by case basis.

ACTIVE REHAB

Active rehab testing should be performed in clinic to determine patient is ready for it starting with lightest exertional level (step 1) 50% MHR for 10 minutes.

Orthostatic BPs with HR are obtained after completion of the test to look for signs of neurogenic dysautonomia or physiologic exercises intolerance.

Both dysautonomia and/or exacerbation of symptoms are considered failure to tolerate the exercise load and the patient cannot be cleared to perform that step until they re-test on next visit.

Step 1: 50-60% Max HR

Step 2: 60-70% MHR

Step 3: 70-80% MHR

Step 4: 80-90% MHR

Step 5 (if necessary): Functional and resistance movements at full exertion

Physical therapy and Rehab

1. Vestibular-Ocular: usually subjectively delineated by dizziness/nausea/motion sickness. Objectively you may see saccades, +BESS testing, out-of-range accommodation, etc on physical exam. Rehab at a physical therapy facility can be helpful to improve symptoms
2. Cervical: many people with concussion have neck pain, stiffness, or limited ROM. Rehab at a physical therapy facility can also aid in recovery. Everyone with any Sx should get cervical rehab home exercises handout.

Patients with VOMS symptoms should be given a handout if they are able to tolerate exercises (many need 1-2 weeks). More sophisticated vision therapy exercises are provided for PCS patients with persistent vision problems.

Rehab facilities in Tucson and should be provided with handouts of home exercises for vestibular-ocular and cervical rehab.

Consider meclizine/zofran as adjuncts for severe VOM Sx.

If patient is not progressing as planned (i.e. worsening, or no improvement after 4-6 weeks. Referral for specialized vestibular and vision therapy may be warranted in severe cases (St. Joe's Neuro institute, Tonya Pollack Vision therapy)

BEHAVIOR

Sleep:

Review and provide sleep hygiene handout.

Consider sleep study if concerns for sleep apnea with daytime sleepiness, sleepwalking, snoring, etc

Consider CBC, iron studies with ferritin (restless leg)

Start with melatonin if sleep aide needed and can add valerian root as adjunct

Stronger sleep aides: trazadone, amitriptyline, ambien heavier options

Mood:

Review coping mechanisms and interventions

Consider checking thyroid function tests, vitamin D level, Iron, other PCS labs.

Consider psychiatry referral if necessary (CBT, PCS group)

Consider referral to Dr. Rice if necessary (i.e. if patient has underlying developmental delay)

LABS/IMAGING

MRI Brain usually obtained at 6 weeks if symptoms not improving prior to PCS diagnosis to rule out structural lesions.

Functional neuro-imaging is currently investigational and not routinely used

We do order the PCS lab panel screen for persistent symptoms to rule out hormonal, systemic, nutritional deficiency.

***Referrals/resources that may be necessary if diagnosis is transitioning from simple concussion to PCS at around 6 weeks:

- MRI brain to rule out structural pathology

- Formal Vestibular/cervical rehab if not already

- Neuro cognitive and NP testing for 504 planning

- Active Rehab Protocol

- AZ Brain alliance referral

- More aggressive symptom focused therapy

- Other specific referrals for severe symptoms (sleep, migraine, vision, ect)

- PCS labs