

Children's Health Andrews Institute Concussion Rehabilitation Home Exercise Program

Attached you will find exercises that are designed to specifically target the areas in which deficits have been identified following your concussion. Recommendations have been made by your concussion provider below. These exercises are designed to take about 10-15 minutes of your time each time they are completed. Should any questions or concerns arise, please call 469-303-3000 and ask for Carrie Jones, Athletic Trainer for the concussion clinic.

☐ **Smooth Pursuits**

Moving Target Pursuits: 3 sets of 10 repetitions x 3-5 times per day

Clock Pursuits: 2 sets of 1 repetition x 3-5 times per day

☐ **Saccades**

Notecard Saccades: 30 seconds horizontally, 30 seconds vertically x 3-5 times per day

☐ **Convergence**

Pencil Push-ups: 2 sets of 1 repetition x 3-5 times per day

Brock String: 2 sets of 1 repetition x 3-5 times per day

☐ **Vestibular-Ocular Reflex (VOR)**

Horizontal Gaze Stabilization Letter Notecards: 3 sets of 10 repetitions x 3-5 times per day

Vertical Gaze Stabilization Letter Notecards: 3 sets of 10 repetitions x 3-5 times per day

☐ **Visual Motion Sensitivity (VMS)**

Horizontal VOR Cancellation Letter Notecards: 3 sets of 10 repetitions x 3-5 times per day

Vertical VOR Cancellation Letter Notecards: 3 sets of 10 repetitions x 3-5 times per day

Smooth Pursuits Home Exercises

Smooth pursuits are a type of visual tracking that allow the eyes to smoothly follow a moving object while the head remains stationary. Smooth pursuits are frequently used in many different sports as well as with daily activities, including school. Sometimes after a concussion, athletes can have difficulty with smooth pursuits.

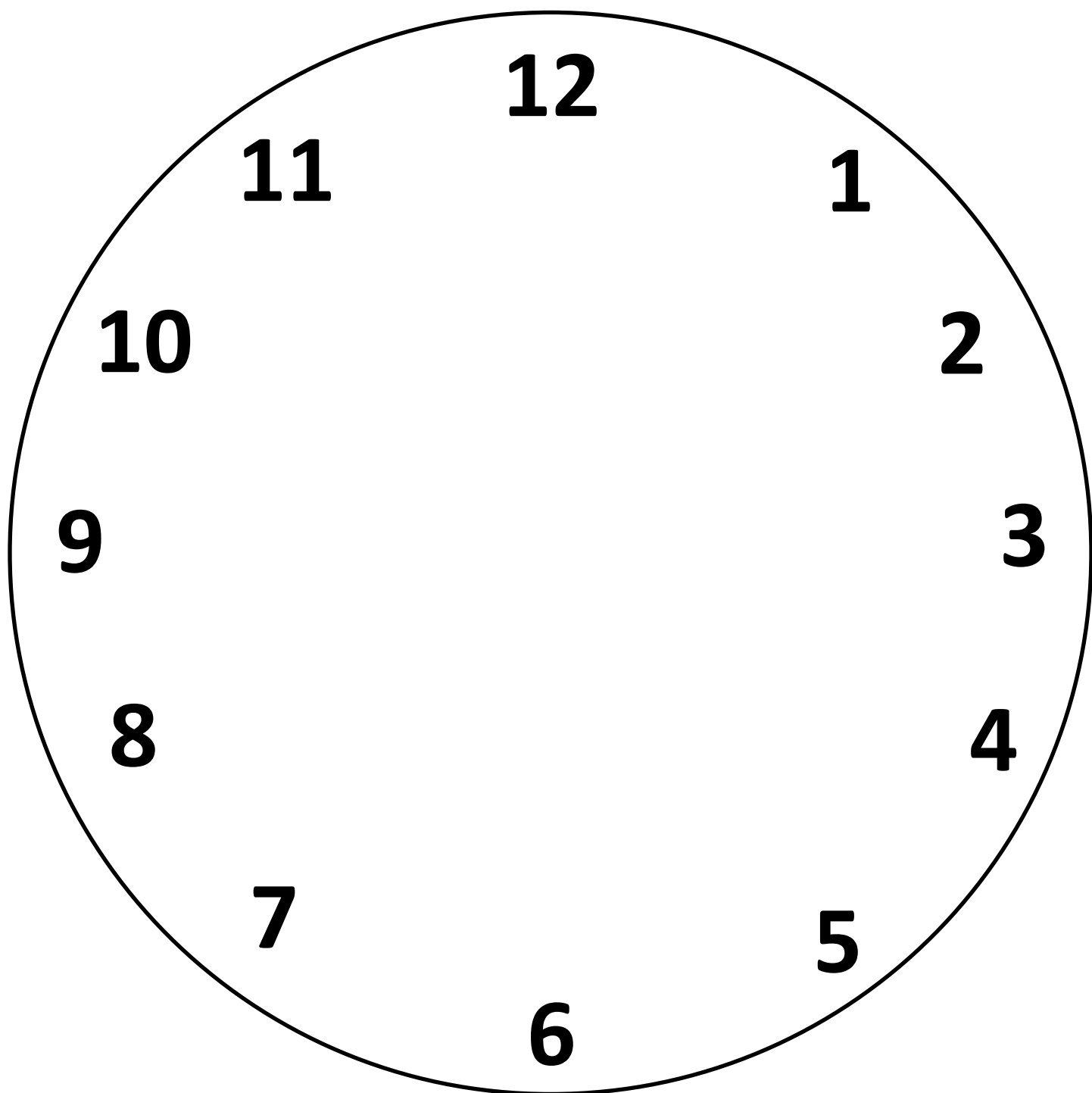
Below are some exercises that you can work on to help strengthen this ocular mechanism. These exercises may cause increased symptoms. You should try to work through these symptoms, however, if they continue to increase, take a break and return to the exercises once the symptoms have decreased in intensity. If you are noticing persistent symptoms that are difficult to work through, try taking frequent breaks or try decreasing the speed at which you are moving through the exercises.

Moving Target Pursuits

1. Use one notecard, sticker dot side facing you.
2. Sit with the sticker dot at eye level and move the notecard slowly in a horizontal plane (from side-to-side) and in a vertical plane (up and down). Your head should remain still for the length of the exercise, moving your eyes only.
3. To make the activity more difficult, you may complete this task in a standing position or while trying to balance on one leg.

Clock Pursuits

1. Attach the clock diagram to the wall, at eye level, and stand about 3-5 feet from the wall.
2. Starting at 12 and keeping your head still, move your eyes in a clockwise motion to each number.
3. Then, starting at 12 and keeping your head still, move your eyes in a counter-clockwise motion to each number (read the clock backwards).



Saccades Home Exercises

Saccadic eye movements are rapid eye movements that allow for quick changes in visual fixation and occur in both the horizontal and vertical plane. These eye movements are especially important in reading tasks and in sports. In sports, saccadic eye movements allow for location of visual targets. Often following a concussion, these types of eye movements slow down and become less accurate.

Below are some exercises that you can work on to help strengthen saccadic eye movements. These exercises may cause increased symptoms. You should try to work through these symptoms, however, if they continue to increase, take a break and return to the exercises once the symptoms have decreased in intensity. If you are noticing persistent symptoms that are difficult to work through, try taking frequent breaks or try decreasing the speed at which you are moving through the exercises.

Notecard Saccades

Using the lettered side of your notecards, place them on the wall, about 12 inches apart, at eye level. Stand about 3 feet from the wall.

1. Start by looking at the notecard on the right and then quickly change your gaze to the notecard on the left. Look back and forth at each target, moving your eyes only. The head should remain still.
2. Change the notecards to a vertical orientation, about 12 inches apart, each one about 6 inches from eye level. Start by looking at the notecard on the top and then quickly change your gaze to the notecard on the bottom. Look back and forth at each target, moving your eyes only. The head should remain still.

Convergence Home Exercises

Convergence is when the eyes move simultaneously inward (towards the nose) to focus on a near object and/or task. Convergence serves an important role in many daily activities, including school and sports. Many athletes have difficulty with convergence following a concussion. When convergence is not functioning correctly, it becomes difficult to see objects in near vision fields. It can contribute to physical symptoms as well as difficulty in school.

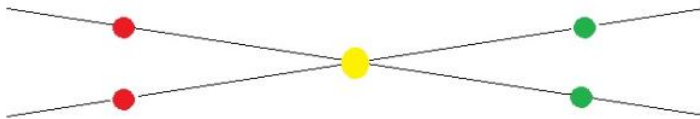
Below are some exercises that you can work on to help improve poor convergence. These exercises may cause increased symptoms. You should try to work through these symptoms, however, if they continue to increase, take a break and return to the exercises once the symptoms have decreased in intensity. If you are noticing persistent symptoms that are difficult to work through, try taking frequent breaks or try decreasing the speed at which you are moving through the exercises.

Pencil Push-Ups

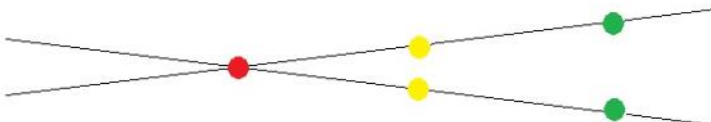
1. Hold a pencil at arm's length and at eye level. The tip of the pencil should be facing upwards, in a vertical orientation, and is the visual target.
2. Slowly move the pencil in a straight line towards your nose, keeping focus on the pencil tip.
3. When you see two pencil tips, stop. Try to refocus your eyes to see one pencil tip. If you can refocus, continue moving the pencil towards your nose. Once you see two pencil tips again, stop.
4. Move the pencil back to arm's length.
5. The goal is to maintain singular vision of the target 6 cm from the tip of the nose at most.

Brock String

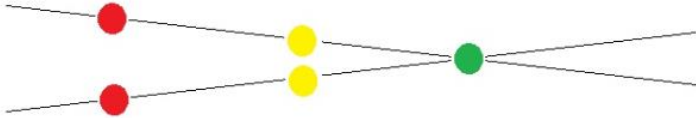
1. Tie one end of the string to a stationary target that sits at eye level (ie - door handle, back of chair). Hold the other end of the string at the tip of your nose, the green bead should be closest to your nose and the red bead farthest.
2. From the tip of your nose, the green bead should be placed at 15 cm, the yellow bead at 30 cm, and the red bead at 60 cm (about 2 feet).
3. First focus with both eyes on the yellow bead. You should see only 1 yellow bead, 2 green beads, and 2 red beads as pictured below. If you see 2 yellow beads, move the yellow bead farther from your nose.



4. Shift your focus to the bead farthest away, the red bead. You should see 1 red bead, 2 yellow beads, and 2 green beads as pictured below:



5. Shift your focus to the bead closest to your nose, the green bead. You should see 1 green bead, 2 yellow beads, and 2 red beads as pictured below. If you see 2 green beads, move the green bead farther from your nose.



6. Continue to work through each bead, green to yellow to red and then red to yellow to green. Focusing individually on each bead.
7. When doing these exercises, work towards the green bead being no farther than 6 cm from the tip of your nose.

Vestibular-Ocular Reflex Home Exercises

The Vestibular Ocular Reflex (VOR) allows for proper coordination of eye movement with head movement. It helps to provide a clear picture during motion and assist with maintaining balance. VOR is also referred to as gaze stabilization.

Below are some exercises that you can work on to help improve gaze stabilization. These exercises may cause increased symptoms. You should try to work through these symptoms, however, if they continue to increase, take a break and return to the exercises once the symptoms have decreased in intensity. If you are noticing persistent symptoms that are difficult to work through, try taking frequent breaks or try decreasing the speed at which you are moving through the exercises.

Horizontal Gaze Stabilization Letter Notecards

1. Use the lettered side of the notecard.
2. Sit upright in a chair and while holding the notecard, extend your arm in front of your eyes.
3. Slowly turn your head to the right and move the notecard to the left, keep your focus on the letter on the notecard. Complete the exercise in the opposite direction. Start to increase your speed while making sure the letter on the notecard remains in focus (the letter should not be blurry). You can pace yourself using a metronome. Start out with a slow rate (70-80 bpm, or slower if needed). As your symptoms improve, start increasing the rate, each session, as tolerated. The goal rate is at least 180 bpm.
4. There are multiple ways to increase the difficulty level of this exercise (as you notice symptom improvement):
 - Stand up with legs spread shoulder width apart (or wider) → progress to narrow stance
 - Stand on one leg
 - Stand on a foam pad or pillow
 - Sit on an exercise ball
 - Walking forwards and walking backwards

Vertical Gaze Stabilization Letter Notecards

1. Use the lettered side of the notecard.
2. Sit upright in a chair, while holding the notecard extend your arm in front of your eyes.
3. Slowly move your head downwards and move the notecard upwards, keep your focus on the letter on the notecard. Complete the exercise in the opposite direction. Start to increase your speed while making sure the letter on the notecard remains in focus (the letter should not be blurry). You can pace yourself using a metronome. Start out with a slow rate (70-80 bpm, or slower if needed). As your symptoms improve, start increasing the rate, each session, as tolerated. The goal rate is at least 180 bpm.
4. There are multiple ways to increase the difficulty level of this exercise (as you notice symptom improvement):
 - Stand up with legs spread shoulder width apart (or wider) → progress to narrow stance
 - Stand on one leg
 - Stand on a foam pad or pillow
 - Sit on an exercise ball
 - Walking forwards and walking backwards

Visual Motion Sensitivity Home Exercises

Visual Motion Sensitivity (VMS) is a way to assess for appropriate functioning of vestibular-ocular reflex (VOR) cancellation. VOR cancellation allows for suppression of the vestibular-ocular reflex so that combined head-eye tracking of a moving object is possible.

Below are some exercises that you can work on to improve tolerance and performance of activities associated with VMS. These exercises may cause increased symptoms. You should try to work through these symptoms, however, if they continue to increase, take a break and return to the exercises once the symptoms have decreased in intensity. If you are noticing persistent symptoms that are difficult to work through, try taking frequent breaks or try decreasing the speed at which you are moving through the exercises.

Horizontal VOR Cancellation Letter Notecards

1. Use the lettered side of the notecard.
2. Sit upright in a chair and hold the notecard at arm's length in front of your eyes.
3. Begin slowly moving your head side-to-side (horizontally), while moving the card in the same direction as your head at the same speed. You can pace yourself using a metronome. Start out with a slow rate (60-70 bpm, or slower if needed). As your symptoms improve, start increasing the rate, each session, as tolerated. The goal rate is at least 120 bpm.
4. Each session, you should complete this task as fast as possible while still maintaining focus of the letter on the notecard (the letter should not be blurry).
5. There are multiple ways to increase the difficulty level of this task (as you notice symptom improvement):
 - Stand up with legs spread shoulder width apart (or wider) → progress to narrow stance
 - Walking forwards
 - Walking backwards
 - Complete against a busy background
 - Complete in a busy, loud, highly stimulating environment

Vertical VOR Cancellation Letter Notecards

1. Use the lettered side of the notecard.
2. Sit upright in a chair and hold the notecard at arm's length in front of your eyes.
3. Begin slowly moving your head up and down (vertically), while moving the card in the same direction as your head at the same speed. You can pace yourself using a metronome. Start out with a slow rate (60-70 bpm, or slower if needed). As your symptoms improve, start increasing the rate, each session, as tolerated. The goal rate is at least 120 bpm.
4. Each session, you should complete this task as fast as possible while still maintaining focus of the letter on the notecard (the letter should not be blurry).
5. There are multiple ways to increase the difficulty level of this task (as you notice symptom improvement):
 - Stand up with legs spread shoulder width apart (or wider) → progress to narrow stance
 - Walking forwards
 - Walking backwards
 - Complete against a busy background
 - Complete in a busy, loud, highly stimulating environment