

Adult Traumatic Brain Injury Case Study

About Darren

Darren is a twenty-year-old male who sustained a closed-head injury with multiple fractures from a motor vehicle accident approximately five months ago. He apparently had a hypoglycemic episode while driving and blacked out. Darren is also diabetic and due to his stay in a hospital bed, he developed a heel ulcer. After about two months, Darren was then admitted to a comprehensive brain injury program. Through cognitive assessments and evaluations, it was found that he has impairments in the following areas: organization/planning, attention/concentration, immediate and delayed recall of verbal information, and written organization. At the time of his admission to the program, Darren was under toe-touch weight-bearing precautions due to his fractured hip and right heel ulcer, and he was ambulating with a walker. He also reported a rating of 3 out of 10 regarding pain in his right lower extremity. Darren began Interactive Metronome treatment as an added treatment tool to address the cognitive deficits and to help progress him physically with his right lower extremity as his weight-bearing precautions are lifted.

Initial Evaluation

Once admitted to the brain injury program, Darren went through a series of evaluations given by the speech pathologists and the occupational therapists. The Benton Controlled Oral Word Association Test was given to assess his verbal organization skills, and he scored within the 58th percentile. The Championship Season Test was administered to assess his written organization skills, and he scored a 0%. The Babcock Story Recall Test was given to assess his immediate recall of verbal information, and he scored in the 21st percentile. Through the community living skills evaluations administered by the occupational therapists, it was found that Darren had difficulty with organizing/planning, attention to visual detail, and attention/concentration. The focus of Darren's goals for the first month's treatment included immediate recall of verbal information, written organization, verbal organization, and the use of strategies.

An IM Pre Long Form Assessment was also administered. Darren had to complete the exercises in a sitting position and was unable to complete exercises involving the right foot due to his strict toe-touch weight-bearing precautions. After the occupational therapist demonstrated each individual exercise, he was able to mimic the movements with minimal cuing. He was only able to complete 8 out of the 14 tasks due to the physical restrictions. During this assessment, it was noted that Darren became easily distracted and began talking tangentially in between each task. It was also noted that Darren was able to get himself into a rhythm fairly quickly. The results of the assessment (shown below) fell in the "Below Average" range according to the IM Indicator Chart.

Unadjusted Overall ms	Super-Right-On (SRO)
116.5	7.3%

Development and Execution of an Individual IM Treatment Plan

A treatment plan was developed based on Darren’s individual needs, test results, and the transdisciplinary team’s observations of him during treatment sessions. The provider identified that Darren liked to be challenged and was motivated to return to college. The IM treatment plan involved increasing the repetitions steadily to work on Darren’s attention/concentration. The plan was to work on the tasks that involved mostly the upper extremities and the left foot due to his lower-right extremity precautions, and then as the weight-bearing precautions were lifted, he could begin using the lower-right extremity as well as completing tasks in a standing position.

The beginning IM goals established by the provider were to make any necessary modifications to the program to accommodate Darren’s weight-bearing status as well as familiarize him with the movements and guide sounds. Darren’s IM treatment began with exercises 1-4 and 9 with a total duration of almost 19 minutes (1000 repetitions), just under four minutes (200 repetitions) each. He was able to learn the guide sounds within the first few treatment sessions and demonstrated the ability to adjust his movements accordingly. By the next session, he was able to tolerate tasks totaling nearly 26 minutes (1400 repetitions).

Darren established a few personal goals that he would like to accomplish through the IM program including increasing his attention/concentration, timing, and overall activity tolerance.

Interim Testing and the Next Phase

After completing five sessions, an Interim Long Form Assessment was completed to review Darren’s improved weight-bearing ability and to assess his IM progress thus far. He was now able to complete 11 out of 14 tasks, several of them in a standing position. His unadjusted overall millisecond score was 46.5 and his SRO was 27.3%. During the next five sessions, he continued to require cuing between exercises to stay focused due to his tendency to carry on tangential conversations.

Through observations made by the provider, it was determined that the typical 13-15 sessions were not going to be sufficient for Darren to benefit fully from the IM treatment program. Another Interim Long Form Assessment was completed after the twelfth session. His unadjusted millisecond score was 40.7 and his

SRO was 28.6%. He was now able to complete more of the tasks in a standing position, holding onto a chair to assist with his balance. The treatment team was beginning to observe some improvements such as Darren becoming less fidgety during his social interactions with other clients as well as less tangential with his speech. The IM treatment was also helping him get used to weight bearing. Prior to IM treatment he had not been putting much weight on his foot. At that point, he set goals for himself including the completion of all tasks in a standing position and an increased number of bursts. The provider set goals to work on the exercises that he had more difficulty with as well as to reach 37 minutes of IM tasks (2,000 repetitions) in one session involving several different tasks to increase his ability to attend over a longer period of time.

Concluding Evaluation

Once Darren met his personal goals and the goals established by the provider, the IM Post Long Form Assessment was completed. The results are listed in the chart below:

Unadjusted Overall ms	Super-Right-On (SRO)
29.8	39.5%

His scores significantly improved as compared to the IM Pre Long Form Assessment. The overall millisecond score decreased by 86.7 milliseconds, the SRO increased by 32.2%, and the early timing tendency decreased by 31.1%. Darren was able to complete 13 out of 14 tasks, all in the standing position.

The Benton Controlled Oral Word Association Test was re-administered to assess any improvements with his verbal organization skills, and he scored in the 72nd percentile. His written organization skills were re-tested through the Championship Season test, and he scored a 100%. Darren's score on his immediate recall of verbal information remained the same. It must be noted that these tests were re-administered approximately one week before he completed the IM program to assess his progress in the full brain injury program. Through behavioral observations, the team noted some improvements with his attention/concentration and attention to visual detail. He was also able to improve his balance and weight-bearing tolerance on his lower-right extremity. This may have been due to the combination of IM treatment as well as the physical therapy he was receiving.

Darren's Thoughts

Darren felt the IM program had helped mostly with his concentration. At first, he felt the program would be easy but soon realized it was challenging and looked forward to the sessions each week.

Conclusion

Although Darren continues receiving treatment through a comprehensive cognitive program for his brain injury, it appears that the IM program had been a good asset to his treatment and progress.

Darren was an unusual case in which the program needed to be modified to accommodate his weight-bearing precautions, allowing him to progress to a standing position once the precautions were reduced. He continued to be under partial weight-bearing status until after he completed IM treatment. He was also able to tolerate the steady increases in repetitions well. Overall, Darren responded well to the challenges the provider presented with each IM treatment session.