From Injury to Music: The role of occupational therapy in reintegrating a tetraplegic DJ

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Spinal Cord Injury

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Defined as damage to the spinal cord that results in impaired motor and sensory functions below the level of injury.

Considered one of the most complex conditions in terms of treatment and rehabilitation.

Causes include traumatic injury as well as tumoral, infectious, degenerative, vascular, or hematological processes.

Spinal Cord Injury

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Main Outcomes of Spinal Cord Injury:

Physiological impairment of organs and tissues below the injury level.

Reduced ability to perform daily living activities, including participation in family, work, and community roles.

These outcomes are accompanied by significant psychological and social responses.

Classification of Spinal Cord Injury

The American Spinal Injury Association (ASIA) developed a standardized neurological and functional classification system for Spinal Cord Injuries.

Severity is determined by the neurological level and the extent of motor and sensory impairment.

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Types of Impairment:

Tetraplegia: Impairment in cervical spinal segments

Paraplegia: Impairment in thoracic, lumbar, or sacral segments

Injuries are classified according to their level of completeness:

Incomplete injury, Complete injury.

Functional Impact of Tetraplegia

Individuals with tetraplegia experience significant impairment in daily functioning

varying levels of dependence in basic activities such as mobility, dressing, bathing, and eating

limitations in extended activities such as employment, leisure, and household management.

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Occupational Therapy

Rehabilitation following spinal cord injury focuses on preventing complications and improving function by maximizing existing abilities.

The role of occupational therapy in the rehabilitation process is central and includes:

- Improving upper limb function
- Enhancing basic and instrumental activities of daily living
- Adapting assistive devices and technology
- Modifying the home environment
- Preparing for return to work and meaningful leisure activities

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Returning to Work

Higher quality of life, life satisfaction, psychological adjustment, and perceived health are significantly associated with employment.

Return-to-work rates among individuals with spinal cord injury reported at 10–30%, with only a small proportion returning to their pre-injury occupation.

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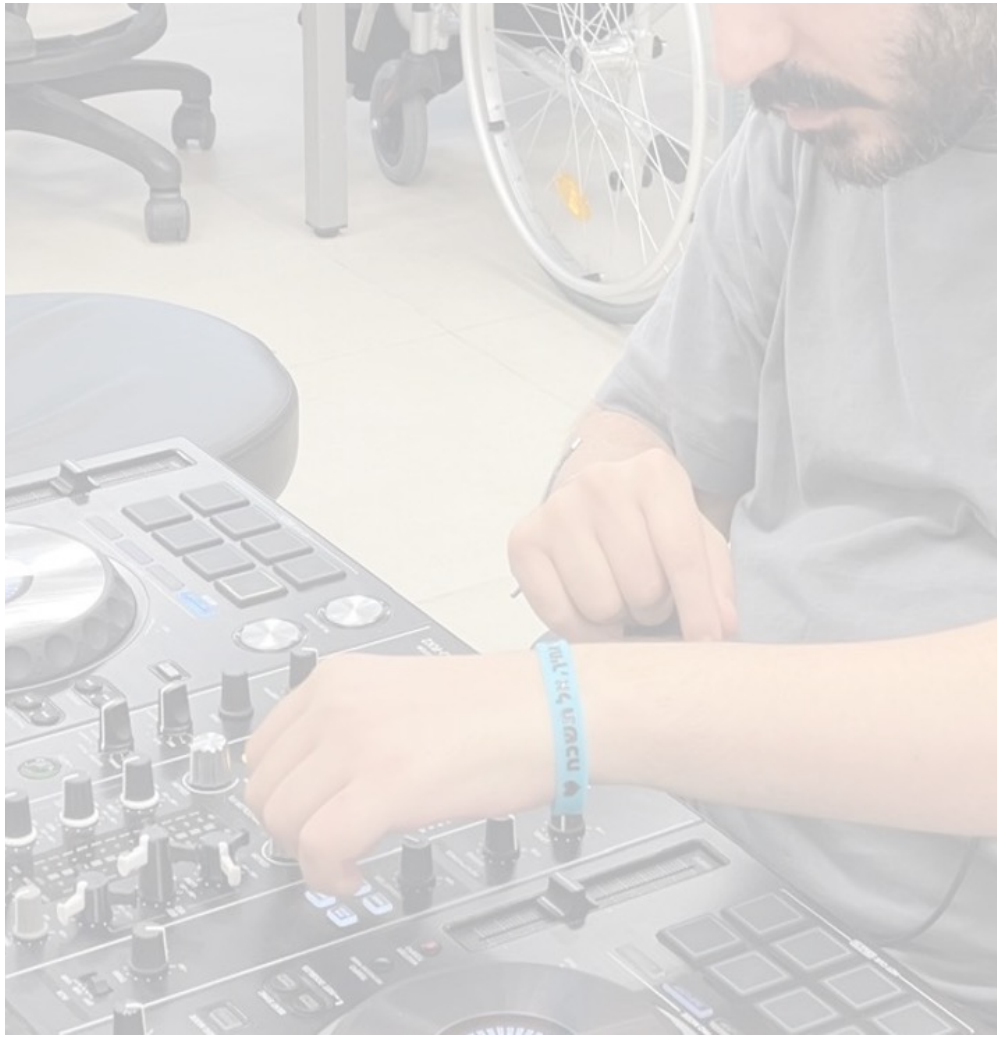


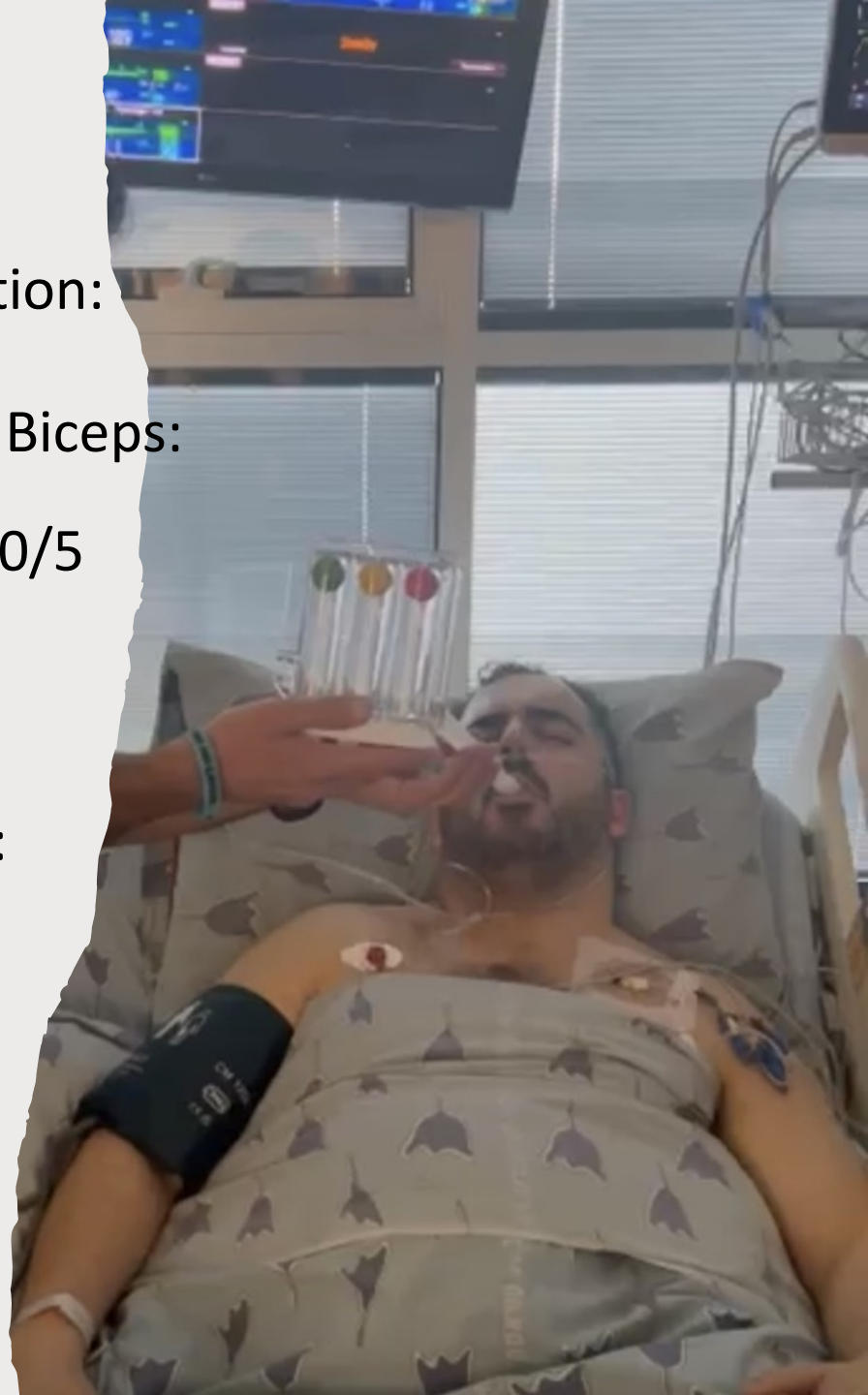
Case Study

- A 34-year-old male
- single with no children, with 12 years of education
- working as a famous DJ and music producer.
- He was fully independent in all functional activities prior to the injury.
- In March 2023, he sustained a cervical spinal cord injury
- due to a gunshot wound, resulting in C5 tetraplegia (ASIA C).

Case Study: Initial Status

Neurological and functional status upon admission to rehabilitation:

- Significant weakness in all four limbs: Deltoids: 1/5 bilaterally, Biceps: 3/5 bilaterally, All other upper and lower limb muscle groups: 0/5
- Difficulty maintaining sitting balance; unable to stand or walk
- Severe limitation in basic activities of daily living – SCIM score: 10/100
- Severe limitation in instrumental activities of daily living (e.g., phone use)



Treatment course

During hospitalization, occupational therapy followed both a remedial and a compensatory approach.

<u>The treatment goals included:</u>

- Maintaining range of motion through splinting
- Strengthening upper limb muscle groups and improving endurance
- Improving fine motor skills
- Improving function while sitting and standing
- Achieving maximal independence in basic and instrumental activities of daily living

Multidisciplinary Rehabilitation

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During rehabilitation, the patient received multidisciplinary treatment

Additional consultations were conducted with nerve and tendon transfer surgeons and at a neuromuscular clinic to reduce spasticity.

The patient's neurological and functional status improved significantly, enabling progressive achievement of treatment goals.

Neurological and Functional Improvement

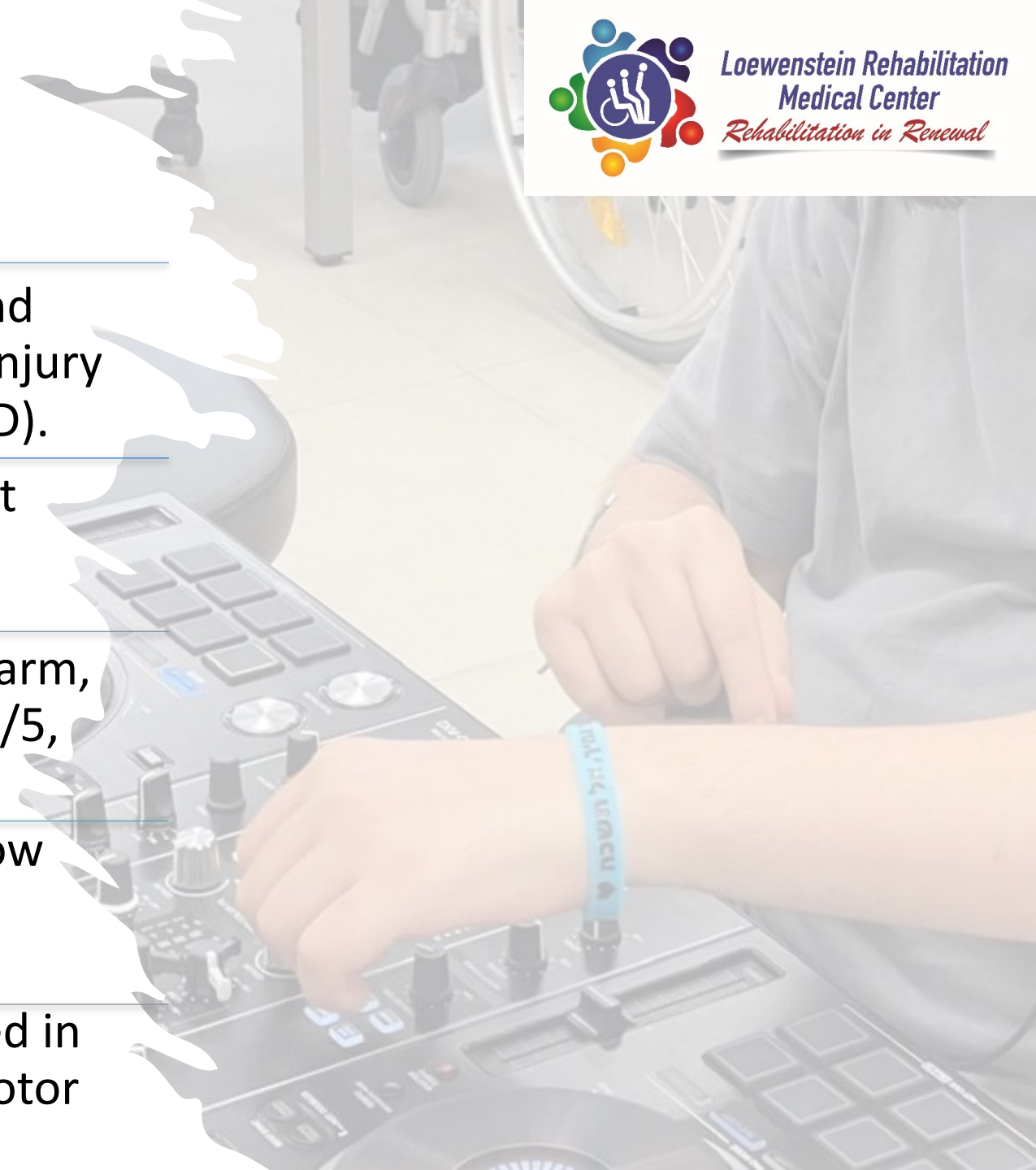
During hospitalization, significant neurological and functional improvement was observed, and the injury classification progressed to Tetraplegia C5 (ASIA D).

Upper limb function: Full range of motion in most joints, increased distal tone

Right hand: Strength 4/5 in shoulder, elbow, forearm, and wrist, Finger flexion: 3/5, Finger extension: 2/5, Thumb: 3/5,

Left hand: Shoulder: 3/5, Elbow flexion: 4/5, Elbow extension: 1/5, Wrist: 3/5, Fingers: 2/5

Fine motor control of the fingers remained limited in both hands, with difficulty performing precise motor tasks.



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Functional Status Today

- Sitting - Able to reach various areas in space
- Standing - With anterior support, supervision and bilateral AFO Splints
- Walking - With bilateral Splints and a walker, under supervision, for short distances
- Basic ADL - Independent in eating, partial assistance needed for dressing and bathing – SCIM: 75/100
- Instrumental ADL - Able to operate a phone and a computer using assistive devices

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Return to Work Process

Achieving the goal of returning to work required a multidisciplinary approach.

In occupational therapy:

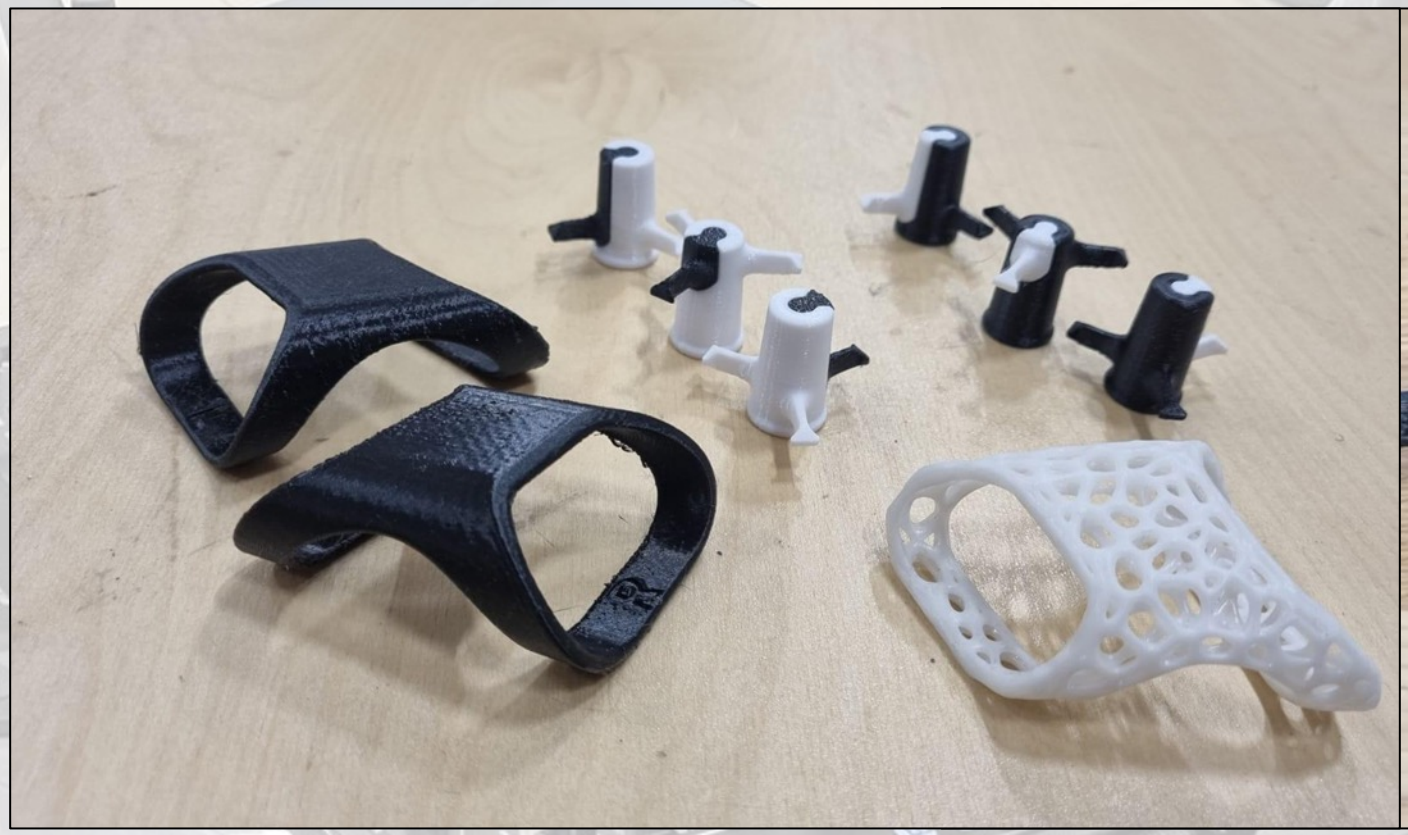
- An activity analysis was conducted to assess the operation of th controller
- Collaboration was established with product-design engineers
- A work station was adapted to allow alternating between sittin and standing.

In physiotherapy:

- Training focused on sit-to-stand transitions and strengthening standing tolerance to enable prolonged operation of the DJ controller.

DJ Controller – Before Adaptation

Adapted controller buttons and customed finger splints

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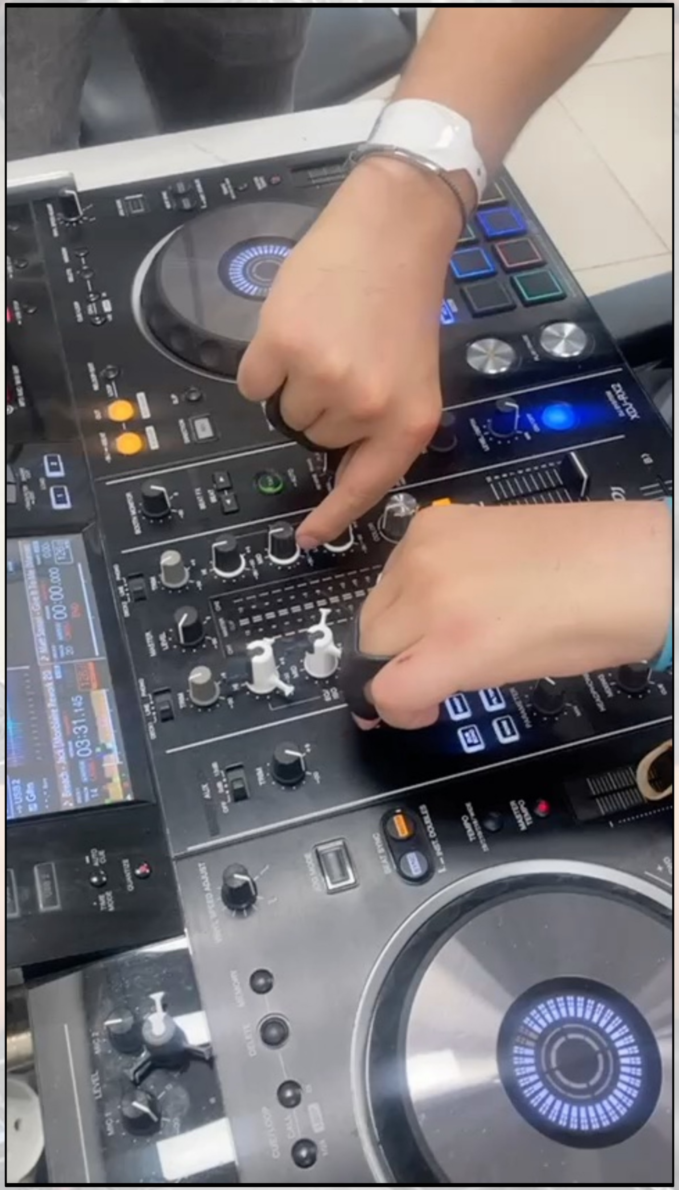

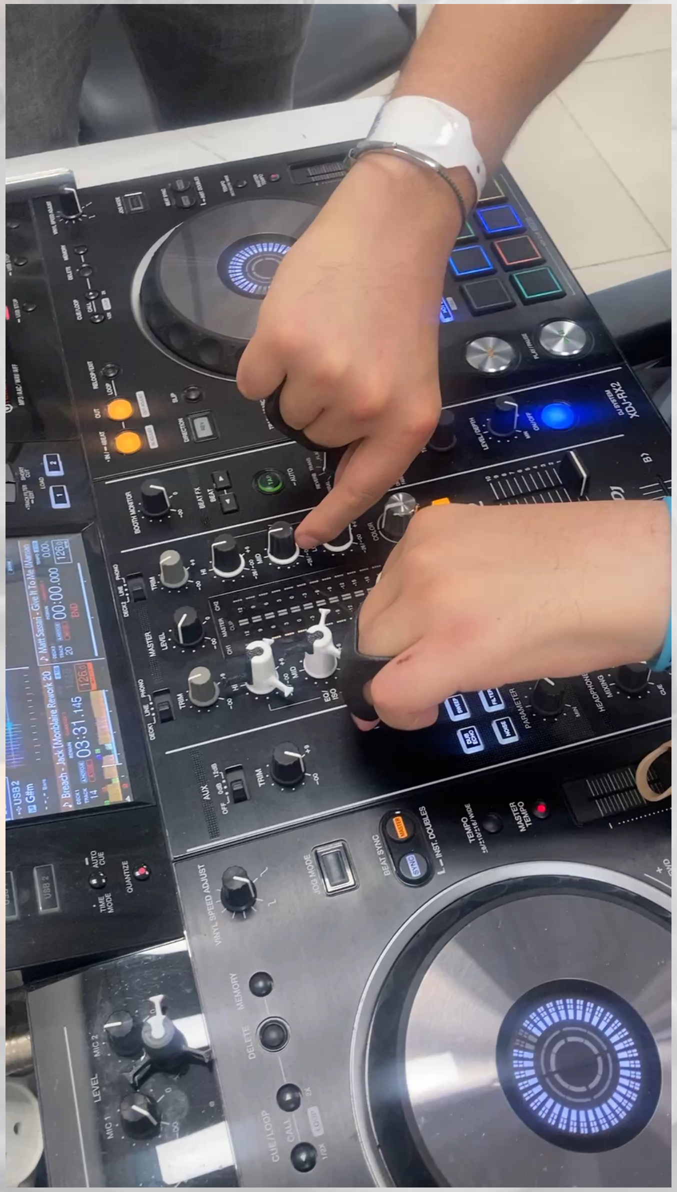

Workstation Adaptation

An adjustable-height table was adapted, allowing height changes at the press of a button and enabling alternating between sitting and standing positions.

Current Barriers to Returning to Work

Motor barriers:

low endurance, difficulty standing and operating the controller for the duration of an event

Benefits:

related disincentive – reduction in disability benefits upon returning to work

Emotional barriers:

feeling “I am not as good as I used to be”; “why would anyone hire me for an event?’"