

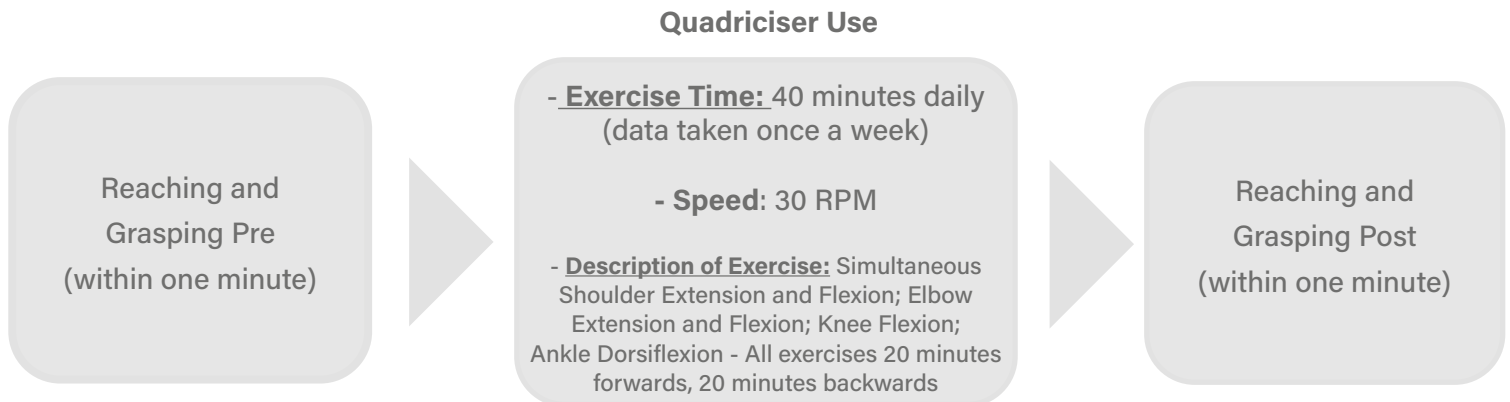
**PURPOSE:** The purpose of this experiment was to determine the effects that the Quadriciser has on reaching and grasping efficiency in a student with CP.

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**METHODS:** Participant: One middle school student with CP participated in this study. The participant experiences fluctuating levels of motor control during a prescribed reaching and grasping task. The subject has cognitive limitations, however fully understands both the task and intervention when prompted.

This was a single subject design with collection of pre and post measures across a seven trial intervention.

Reaching and grasping data was recorded both pre and post Quadriciser use. A session was 1 minute in length.



### Participant -Pre/Post reaching and rasping instances

Week	Pre-Quadriciser	Post-Quadriciser	Change*
Trial 1	2 grasps	2 grasps	0 grasps
Trial 2	2 grasps	2 grasps	0 grasps
Trial 3	3 grasps	4 grasps	1 grasp
Trial 4	2 grasps	3 grasps	1 grasp
Trial 5	3 grasps	5 grasps	2 grasps
Trial 6	3 grasps	5 grasps	2 grasps
Trial 7	4 grasps	7 grasps	3 grasps

\* Numbers indicate positive change in participant's pre/post reaching and grasping efficiency

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**Results:** The participant showed consistent positive change between their pre and post intervention reaching and grasping trials. The Quadriciser appeared to have the greatest impact on reaching and grasping efficiency during trials 5, 6, & 7. Preliminary data may suggest that the Quadriciser has a sustained positive impact on reaching and grasping.

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**Conclusion:** The Quadriciser was shown to produce a positive change in the participant's reaching and grasping efficiency. Further research must be conducted to determine if exercising on the Quadriciser will produce a sustained impact on reaching and grasping efficiency long term.

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**Discussion:** The Quadriciser has not only shown improvements on the participant's ability to reach and grasp, but also in activities of daily living. During the duration of the intervention, it was noted after trial three, the participant learned how to brush her hair. The participant was able to grasp the brush. Then exhibited the arm strength and range of motion

to lift her arm to preform the act of brushing her hair. In addition, the participant experiences a higher instance of critical physiological responses, such as more frequent bowel movements and urinations after the use of the Quadriciser. This suggests that the passive exercise the Quadriciser provides stimulates healthy bodily functions.

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#### Background Reference:

-CP is a condition that is caused by abnormal development or damage to the brain while it is still in its developing stages. It may occur before, after or during birth and lasts through a person's lifetime. Although it is not a progressive disorder, symptoms may vary and change throughout the person's lifetime. (Kriger, 2006).

-CP cannot be cured, so the goal is to manage symptoms and improve functional goals and capabilities. This includes intentional muscle movements, range of motion, cognitive abilities, social interaction, and independence. (Kriger, 2006).

-Children with CP may find it more difficult to grip objects if they have impaired or delayed fine motor skills. They may

lack controlled voluntary movements or show signs of spasticity that can result in tightness in the fingers or closed fists. (Brandao, Ocarino, Bueno, Mancini, 2014).

-The Quadriciser moves all four limbs in a repeated, natural motion. (Quadriciser Corporation, 2019).

-Intentional hand movements should be encouraged in order to maintain and improve range of motion and manipulative skills seen in activities of daily living (ADLs). This is also important in order to prevent hand deformities and joint stiffness. (Orellove, Sobsey, Silberman, 2004, p. 287).