

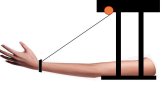
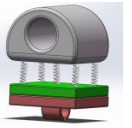


Design	Wrist Spring		Finger Rockwall		Retractable arm exerciser		Arm Spring Board	
Criteria (weight)								
Ease of Use (20)	4/5	16	2/5	8	5/5	20	1/5	4
Comfortability (20)	2/5	8	5/5	20	4/5	16	3/5	12
Safety (20)	2/5	8	3/5	12	4/5	16	3/5	12
Ease of fabrication (15)	4/5	12	2/5	6	3/5	9	1/5	3
Durability (15)	4/5	12	3/5	9	4/5	12	3/5	9
Weight (5)	4/5	4	2/5	2	3/5	3	4/5	4
Cost (5)	4/5	4	3/5	3	3/5	3	2/5	2
Total (100)	64		60		79		46	

Wrist Spring: This design idea involves a very weak torsional spring to help a patient exercise their wrist. This mechanism would help the patient lift their hand and work similar to how a mouse trap works. However, unlike a mouse trap this design will have a much weaker torsional spring and would not hurt the patient. The torsional spring would be weak enough, so it wouldn't lift the patient's hand up all by itself, but yet be strong enough to make moving the patient's wrist easier. Finally, there would be a comfortable strap and hand rest to keep the patient's hand in place comfortably.

Finger Rockwall: This design is meant to exercise the wrist by slowing climbing the fingers up and down a mini rockwall. The device would attach to the side of the Ki Mobility chair and be positioned at a height that is comfortable for the patient. The patient's arm will then rest on the two foam holders. Attached to this device would be a mini rockwall/stair climber for the fingers.

The patient can set their fingers on the first step and climb up the wall using their fingers. This will help the patient work on moving their wrist up and down as they climb the steps.

Retractable arm exerciser:

The purpose of this device is to aid in adduction movement of the arm. To attain this movement the patient will have their arm rested so that the palm of their hand faces upward. The patient has minimal extremity movement and cannot hold up their arm on their own. This device will have a sling type mechanism to fully support the arm which will be positioned just behind the elbow extended to just in front of the shoulder. That sling will be supported by a frame directly above the patient's bicep which is attached to their wheelchair. Considering that the patient has minimal arm movement, full adduction of the bicep will be hard to attain. A second attachment will be positioned at the wrist which connects to the same frame above the bicep. The purpose of the second attachment is to maintain the progress of the bicep adduction. There will be a device that will allow the second attachment to retract in and lock into place. That will allow progress to be made and maintained when the patient gets tired. From there, a release mechanism will allow the arm to lay back at rest to repeat the process.

Arm Spring Board:

The designed device has four different parts: the upper holder, springs, upper plate and lower plate. The design working needs two designed devices both attach on the wheelchair. For elbow flexion and extension, Patients can put their upper arm in the first hole of the upper holder of the front device and lower arm in the second hole of the device in the back to move horizontally. Similar way works for wrist. The vertical distance of upper plate and lower plate can be changed by rotation of the upper plate so that patient can have different angles of flexion and extension and heights of the upper holder (different x-axis).