

## **NSS PROJECT - Kinesthesia in Cerebral Palsy**

### **Report : Wrist Stabilizer**

#### **Aim**

To stabilize the fine wrist movements of cerebral palsy children

#### **Members**

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#### **Abstract**

To stabilize the wrist movements of cerebral palsy children we make a device which uses the fact that their flexor muscles are dominant over their extensor muscles. We use an elastic band to keep the hand in the extensor position as default position. This device can be adjusted to different age groups but of the basic primary children.

#### **Introduction**

The cerebral palsy children have difficulty in the extensor movement. We design a device to enable them the extensor movement by providing an external force.

We went to SPASTN, Taramani, Chennai to meet children who are having this problem.

We assessed their range of wrist movement and then we decided to assist the movements of the wrist in such a way that they can hold items on their own. For this the essential requirement is the proper extensor muscle movement.

#### **Method**

- We use an elastic band to assist the fine movements of the wrist.
- The main idea is to assist the extensor muscle movement of the wrist.
- These children have dominant flexor muscle movement over extensor muscle movement.
- Hence we use this fact of muscle movement against the resistance of the elastic band.

#### **Design of the device**

As the children have dominant flexor muscle movement we keep their wrist in such a position that their extensor muscles are in dominant position. This is done by using an elastic band which attached behind the palm and to part of the hand below elbow.

The attachment of elastic band is done to a glove made of jean cloth which holds the child's hand and the other end is attached to a wrist band. This glove is half cut and also longitudinally cut and has a Velcro attached to it so that it can be used for any age group.

The elastic band is attached with the help of the clip which helps in adjusting the elastic for different age groups.

The next part of the design involves the wrist band which is placed at the upper part of the hand near the elbow. The elastic band is attached to the wrist band and a clip is also attached to adjust the elastic. The wrist band is also cut longitudinally and a Velcro is attached to the wrist band which helps in adjusting the device to different age groups.

## Materials Required

- 1) Glove made of Jean cloth which is half cut and also longitudinally cut.
- 2) Elastic bands which are joined with the help of a clip.
- 3) A wrist band which is longitudinally cut.
- 4) Velcro
- 5) Thread to stitch.



## Preliminary Design

Our preliminary design included a glove to which an elastic is attached and the other end of the elastic is attached to a wrist band which is placed at the upper part of the hand near the elbow.

## Problems faced

- 1) Limitation on the stitching of the glove because it is already manufactured.
- 2) The size of the glove is too big for the test specimen.
- 3) Difficulty in wearing the wrist band and the glove.
- 4) Elastic was not sufficient in providing the sufficient force to keep the hand in the default extensor position.



## Changes made

- 1) Instead of glove we used a band made of cloth to which velcro is attached.
- 2) The band and the wrist band are longitudinally cut and Velcro is attached to them.

3)The band is half cut so that the children will be able to feel the things that they are holding

4)Clip is used to make the elastic adjustable .

### **Future modifications**

- 1) The size of the cloth band is to be made small.
- 2) Design should restrict the horizontal wrist movement.
- 3) Wrist band is made more stable by attaching Velcro to them

### **Results**

The device is a very good tool which enables the extensor movement of the wrist of the cerebral palsy children who have good finger movement. This device primarily helps the smaller children as their muscles are not yet stiff. With few incorporations to the design we wish to help them in movement of their thumb when holding objects also.

### **Expenditure**

Gloves	Rs. 70
Velcro	Rs. 12
Wrist band	Rs 18
Elastic bands	Rs. 20
Tailoring Charges	Rs. 50
Transportation charges	Rs. 30
Total	Rs.200

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