

Birth Brachial Plexus Injury (BBPI)

A Physical Therapy Guide for your Baby

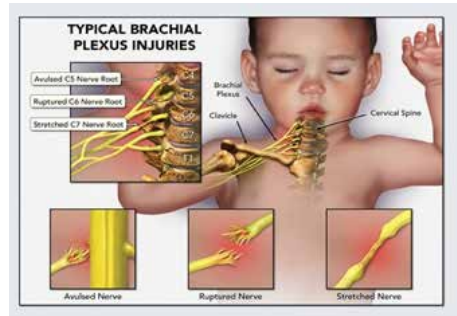


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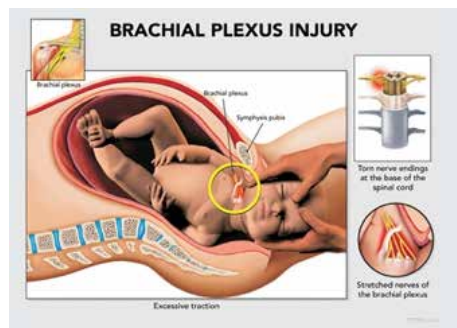
What is Brachial Plexus?

The brachial plexus is a network of nerve roots that originate in the neck region, travels through axilla or armpit, behind the collarbone (clavicle) and branch off to form most of the other nerves that control movement and sensation in the upper limbs, including the shoulder, arm, forearm, and hand. It is formed by the branches from the nerve roots coming out from lower four cervical and first thoracic vertebrae (C5, C6, C7, C8 & T1).



What causes Birth Brachial Plexus Injury?

It occurs when there is an injury (stretching or rupturing) in the brachial plexus during the birth process especially if there is difficulty in delivering the baby's shoulder (see the figure); eventually leading to weakness or paralysis of the muscles of the affected arm/hand.



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Most common causes can be:-

- Fetal
 - Breech delivery.
 - Birth weight more than 4 Kg.
- Maternal
 - Diabetes in pregnancy \leq less than 2%.
 - Narrow birth canal.
- Other causes
 - Shoulder dystocia: shoulder is trapped in the birth canal.
 - Prolonged labor.
 - Use of forceps or vacuum.
 - Direct birth trauma (Perinatal fracture of clavicle).

When to start Physical Therapy?

- Physical therapy should be started after the inflammation signs along with pain subside (this is immobilization period within two weeks of birth).
- If there is a fracture of the clavicle, physical therapy will start once the fracture has healed and with a pediatrician referral.
- Parental participation in physical therapy is necessary to ensure a prescribed regimen is maintained and steady progress is achieved.
- Your child will be regularly reviewed by the Physical Therapist in NICU and PT Outpatient Clinics to monitor how your child is progressing.

What can I learn from a Physical Therapist ?

1. Handling your child.
2. Proper wrapping.
3. Positioning while feeding, carrying and sleeping.
4. Dressing.
5. Exercises.

Handling your child

- The injured arm should be supported at all times.
- When handling your child, you should not be afraid to touch or handle your child's arm. However, it is important that you teach family and friends not to pull or lift your child by their affected arm.
- When bathing your baby, always give his arm support so it is not hanging by his side.
- As the sensation is reduced, the baby may not have much feeling (such as temperature or pain) in the affected arm therefore extra care needs to be taken with bathing and the water should not be too hot.

2. Proper wrapping

Wrap your baby securely with the weaker arm bent at the elbow and supported across the chest, encouraging the wrist and fingers to be kept straight. Avoid wrapping your baby with their arm straight by their side as this can make it difficult for your baby to move their arm (see the figure in page 6).

3. Positioning while feeding, carrying and sleeping

- When you pick up your baby, provide support behind the shoulders. Bring the affected arm forward and keep it supported.
- During feeding, the affected arm should not hang or fall behind the body and should not be compressed against the mother's body. (please see breast feeding positions)
- When awake, position your baby on their back, tummy, and on their unaffected side initially.
- Back: Encourage your baby to turn their head to both sides to look at toys. Position yourself on the side of your baby's affected arm so that they will turn to that side to look at you. It is preferable to support the affected arm with towel roll (see the figure in page 6).
- Tummy: Take special care to protect the affected arm by keeping the arm close to your baby's body. Your baby may tolerate this position better on a small roll or wedge. This position will help your baby strengthen their neck and shoulders and experience some weight bearing through their affected arm.
- Lying on their unaffected side: You may use a roll or pillow behind your baby for support. Bring both hands together in front.
- Make sure the affected arm is not positioned underneath the body when lying on the side. (see the figure in page 6).



Dressing:

- When dressing, put the affected arm through the sleeve first. This leaves the non-affected arm to do the twisting and turning.
- When undressing, take the non-affected arm out first. The affected arm will then easily slip out without any twisting (see the figure in page 6).

Exercises

Passive Range of Movement

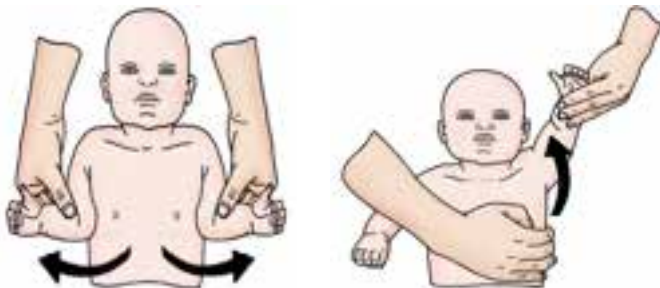
- These exercises should be performed with your child lying flat on a firm surface.

These exercises should be:

- Initially performed slowly and gently at least three times a day.
- Closely watch the infant's face for signs of pain or discomfort.
- Repeated 10 times and hold for 10 seconds at the end of each exercise.

Shoulder exercises

- Elevation: Gently hold your child's forearm and lift their arm up above their head. Keep the arm close to their ear.
- External Rotation: This is the most important exercise.
- Bend your child's elbow to 90 degrees while holding the elbow in at the side. Rotate the arm out to the side towards the mat. It is important that you do both of their arms together. This allows you to compare the affected arm with the unaffected arm and to ensure that your child doesn't roll and limit their movement.
- Note: Keep the upper arm adherent to the trunk to avoid shoulder dislocation.

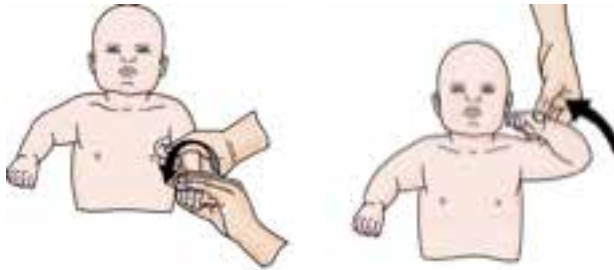


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Elbow exercises

- Flexion and Extension
- Grasp your child's forearm and gently bend and straighten their elbow fully.
- Pronation and Supination
- Bend your child's elbow to 90 degrees, grasp firmly around their wrist and rotate their forearm so that their palm turns towards their face and then towards their feet. It is important that you hold onto the forearm and not their wrist.



Wrist, Fingers and Thumb Exercises

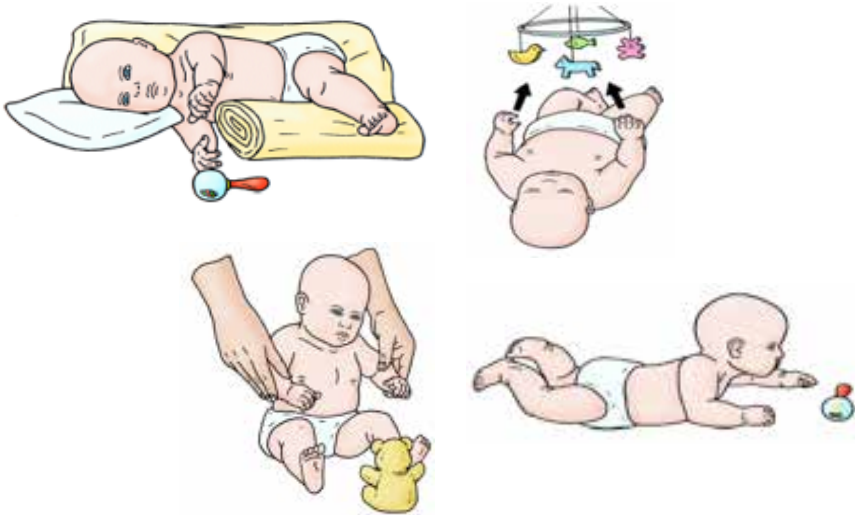
- Wrist extension
 - Grasp your child's hand and bend their wrist backwards.
 - Fingers extension
 - Hold your child's fingers and straighten all of their joints fully.
- * Exercises 1 and 2 may be combined.

- Thumb extension
- Grasp your child's thumb and straighten it fully making sure that you
- Gently stretch the space between their thumb and index finger.



Exercises when playing

- These exercises may be performed as often as you like and are to be done in addition to the stretching passive range of movement exercises.
- Dependent upon the extent of your child's injury, you may have to assist the affected arm with these exercises.



Reaching exercises

- Place your child on the floor and suspend or hold a toy above them.
- Encourage your child to reach for the toy, especially with their affected arm.
- (your baby will need to see the toy first).
- Lay your child on their side with the affected arm uppermost. You may need to support your child in this position by placing cushions or rolled up towels at their back and in front of them. Put toys in front of them to encourage activity of the affected arm.
- No shoulder abduction exercises.
- For a baby older than six months, place them seated on your thigh and encourage the child to bring a toy presented outward and bring toward his mouth.

Support / weight bearing exercise

- Place your child on the floor on their front with their arms forward. Initially you may need a rolled up towel under their chest to support them. Encourage your child to put weight through their affected arm and then progress this exercise by encouraging them to reach for a toy with each arm.
- Co-ordination/two handed exercise)For baby above six months of age (
- Place your child lying on their back or in supported sitting position. Place your hands on your child's arms and encourage them to reach for a toy in front of them with both hands (assist the affected arm as necessary). You can also do clapping with your child to encourage the use of both hands.

Sensation exercises

- These exercises aim to increase the awareness and sensation of your child's arm.
- Stroke and massage their arm or rub the skin with various textures. Velvet materials (cotton balls/soft brush) may be used for soft sensations and coarser materials(sensory balls/ bath towel) for rough sensations.
- Encourage your child's awareness of their arm by involving it in all activities e.g. bringing their hand to their mouth and face or clapping their hands together. At two to three months of age, you can start placing small rattles or toys into their affected hand



Do's

Wrapping technique



While wrapping your baby, the weaker arm must be bent at the elbow and supported across the chest



Start wrapping the affected arm first.



Wrap your baby securely.

Side Lying Position



When lying on their side, position your baby on their unaffected side: You may use a roll or pillow behind them for support. Bring both hands together in front

Sleeping Position



When baby is lying on his back, provide support to the affected arm with a towel roll.

Carrying position



When your baby is being carried, give their arm support with your arm or body so that the weight of the arm does not drag on the shoulder.

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Undressing



When undressing, take the non-affected arm out first. The affected arm will then easily slip out without any twisting.

Dressing



When dressing, put the affected arm through the sleeve first. This leaves the non-affected arm to do the twisting and turning.

Note: Use front opening or back opening clothes. Don't use overhead clothing for a short time

Don'ts



Do not lift your baby by the arms.



Avoid dangling of the affected arm



Cradle hold



Cross-cradle hold



Football hold



Lying on your side



Laid-back



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