**Arthrogryposis Multiplex Congenita—Amyoplastic Type (AMC)**

**Child’s Age: 4 weeks**

**Practice Pattern: 4A**

**Care Coordination:**

1. **Body Structure and Function:** The child presents with bilateral grade IV congenital calipes equinovarus (CTEV) based on the Diméglio method of classification.1,2
2. **Goal:** By the end of treatment, the child will have an alignment at the ankle that allows the child to stand on the bottoms of his feet—“plantigrade foot with no residual forefoot adduction, forefoot cavus, or hindfood varus and a minimum of 5° passive ankle dorsiflexion.”2(pg. 1502) This will give the child a more stable base while standing and attempting ambulation when he gets older.
3. **Intervention:** Refer child to a pediatric orthopedic specialist to begin serial casting and possible tenotomy (Ponseti Method).3,4 Educate the parents on the importance of compliance with braces following casting intervention to prevent recurrence of club feet.2

**Family Related Instruction:**

1. **Body Structure and Function:** The child presents with “internally rotated shoulders, extended and pronated elbows, and flexed wrists.”1(pg. 318)
2. **Goal:** Improve range of motion in upper extremities to within functional limits to allow child to participate more fully in activities of daily living as he grows older, including feeding, dressing, and object manipulation with hands.1
3. **Intervention:** Teach parents stretches for shoulder external rotation, elbow flexion and supination, wrist extension, and finger extension. Each stretch should be held for 20-30 seconds, 3-5 times per session.5  Help the parents to incorporate stretching into the daily routine during times in which the caregiver is already with the child (ex: before every feeding). Provide handout for the parents with pictures and instructions of each stretch.

**Direct (procedural) Intervention:**

1. **Body Structure and Function:** The child presents with externally rotated, abducted, and flexed hips.1
2. **Goal:** In 6 weeks, increase bilateral hip extension by 10°.
3. **Intervention:** Place child in prone position with towel roll under infant’s chest for 5 minutes, or as long as he can tolerate it.1,5 In supine, place large Velcro strap around patient’s knees to improve internal rotation and adduction of the hips.1 Educate parent on importance of prone positioning in child’s development and in the treatment of hip flexion contractures.5 Encourage parent to place child in prone multiple times a day during normal parts of the child’s daily routine (ex: after every diaper change) for as long as child will tolerate it. Teach parent how to correct positioning of knees and hips in the prone position so that the hips are not externally rotated or abducted while in prone.

**Obstetric Brachial Plexus Injury (OBPI)—Erb’s Palsy (C5-C6)**

**Child’s Age: 3 months**

**Practice Pattern: 5F**

**Care Coordination:**

1. **Body Structure and Function:** The child presents with Erb’s palsy, characterized partly by internal rotation, adduction, and extension of the shoulder and forearm supination.1
2. **Goal:** Improve range of motion in shoulder and forearm to decrease child’s need for nerve reconstruction surgery and to allow for increased participation in play and activities of daily living including feeding, dressing, and object manipulation.1,6
3. **Intervention:** Refer to occupational therapist for a shoulder splint for that holds the child’s shoulder in abduction and external rotation, and forearm in supination.6 Educate parent on the importance of wearing the splint in compliance with recommendations from occupational therapist and maintain contact with the occupational therapist throughout splinting intervention to discuss patient’s progress.

**Family Related Instruction:**

1. **Body Structure and Function:** The child presents with decreased range of motion in shoulder flexion, external rotation, and abduction, elbow flexion, forearm supination, and wrist and finger extension.1,7
2. **Goal:** In 8 weeks, the child’s range of motion in her shoulder, elbow, forearm, wrist, and fingers will improve to within normal limits (WNL).
3. **Intervention:** Educate parents/caregivers on stretching protocols for the child’s affected arm.7 The stretching will target shoulder flexion, external rotation, and abduction, elbow flexion and extension, forearm pronation and supination, and wrist extension, abduction, and adduction, and finger flexion, extension, abduction, and adduction.7 Each stretch should be held for 30 seconds in a pain-free range and performed multiple times a day (with each diaper change, or 10-15 times).7 Educate parents on how to assess discomfort in the infant by the faces she makes.7 Provide a handout with pictures and instructions for each stretch.7

**Direct (procedural) Intervention:**

1. **Body Structure and Function:** The child demonstrates muscle weakness in “rhomboids, levator scapulae, serratus anterior, subscapularis, deltoid, supraspinatus, infraspinatus, teres minor, biceps, brachialis, brachioradialis, supinator, and long extensors of the wrist, fingers, and thumb”1(pg. 629)
2. **Goal:** In 10 weeks, the child will improve muscle strength of all muscles in the shoulder girdle and arm by at least 1/7 on the Active Movement Scale.8
3. **Intervention:** Place child in side-lying on unaffected arm.1 Encourage child to move affected arm by placing enticing toys in front of affected arm in a way that the child would have to reach for them or bat at them.1  Provide tactile stimulation and assist as necessary.1 Stabilize scapula to ensure that patient uses the correct musculature when performing reaching activities.1 Move toys in different directions to encourage movement in all planes. As child’s strength improves, increase length of the reach and number of repetitions the child performs. Throughout treatment, educate parents on quality of movements and the importance of encouraging child to use affected arm by placing child in side-lying on unaffected arm and placing objects of interest on the affected limb side.

**Heart Transplant**

**Child’s Age: 10**

**Practice Pattern: 6C**

**Care Coordination:**

1. **Participation:** The patient demonstrates significant anxiety with the idea of leaving his bed post-surgery.1
2. **Goal:** Decrease anxiety levels and improve patient morale post-surgery intervention so that he understands the importance of physical therapy and is more willing to participate.1
3. **Intervention:** Refer patient to child life specialists in the hospital to help ease anxiety of patient and provide encouragement for the child during his stay in the hospital.9 Work alongside the child life specialist to create a rewards system for participation in physical therapy, and engage child in therapeutic play during therapy to improve chances of optimal outcomes.

**Family Related Instruction:**

1. **Body Structure and Function:** Following cardiac surgery, the patient is at high risk for developing atelectasis.1
2. **Goal:** Mobilize secretions, increase aeration, and decrease risk for atelectasis while patient is inactive in hospital.1
3. **Intervention:** Give the child a choice between blowing bubbles, blowing a windmill, and using an incentive spirometer.10 Educate child and parents about the importance of deep breathing, especially long inhalation and ribcage expansion when breathing deeply, in the reduction of pulmonary complications following cardiac surgery.1,11,12  Allow both the patient and his parents to feel the difference at the bottom of his ribcage when he takes a deep vs. shallow breath.1 Require that the patient perform 10 breaths with the device he chooses, 5 times a day (or every time he uses the bathroom).13

**Direct (procedural) Intervention:**

* 1. **Body Function and Structure:** The patient exhibits decreased endurance and lower extremity muscle weakness post-surgery.1
	2. **Goal:** In one week, the child will ambulate 300 feet with contact guard assist from physical therapist.
	3. **Intervention:** After a visit from the child life specialist in which incentives for completing therapy are determined, the child will be mobilized shortly after he is medically stable, with education provided to the patient and his parents about how early mobilization for children in the intensive care unit leads to shorter hospital stays and better functional outcomes.14  During the first therapy session, the child will stand from bedside, following cardiothoracic precautions, and ambulate with assistance from physical therapist five feet from bed to recliner where he will sit for as long as he can tolerate it (goal of 2 hours) to help with drainage.1 Following this initial treatment session where the child learns to trust the therapist and learns the importance of moving around, the patient will participate in therapy every day with increases in distance walked and decreases in assistance from physical therapist with each session as indicated. The patient’s vitals will be monitored throughout session. Pain medicine can be administered 30 minutes prior to PT session to encourage full participation from the patient.1

**Full-Thickness Burn**

**Child’s Age: 8**

**Practice Pattern: 7D**

**Care Coordination:**

1. **Activity:** Patient is unable to ambulate following an above knee amputation of the right lower extremity associated with a full-thickness burn to right side of his body.1
2. **Goal:** Improve patient’s mobility by fitting him with a prosthesis so that he can be as independent as possible as he begins to acclimate himself to life post-burn.1
3. **Intervention:** Refer patient to a prosthetist with experience working with patients with burns to get fitted for a prosthesis for the right lower extremity.1 Report any issues the patient has with the prosthesis to the prosthetist to ensure patient is comfortable and able to use the prosthesis as much as desired.1

**Family Related Instruction:**

1. **Body Structure and Function:** After skin grafting, patient is developing a contracture in the right hip flexors due to increased hip flexion during scar formation and poor positioning in hospital bed.1
2. **Goal:** Increase hip extension to WNL to allow for successful use of the prosthesis when it arrives.
3. **Intervention:** Educate patient and parents about the importance of positioning in bed. The hip should be placed in neutral between flexion and extension, and in ~15° abduction.15 Positioning can be achieved by using pillows, wedges, towels, or sandbags.15 In addition, explain the importance of prone positioning, performed multiple times throughout the day.1,16 Explain that while prone positioning may be extremely uncomfortable, it is necessary to maintain range on motion in hip. Set goal of maintaining prone positioning for one hour or more per day.17 Encourage patient to perform 10 repetitions of hip extension in prone, 3 times a day. If hip extension in prone is too difficult, place patient in side-lying on unaffected side and have him perform hip extensions in side-lying. If this is too difficult, show parents how to assist child in performing these exercises in side-lying. If contracture does not improve, educate patient and parents on possibility of spica cast to improve range of motion.1

**Direct (procedural) Intervention:**

* 1. **Body Structure and Function:** Patient demonstrates flexion and abduction range of motion limitations in right shoulder due to scar tissue formation following skin grafting.1
	2. **Goal:** Increase range of motion in shoulder to WNL to allow patient to participate in ADLs.1
	3. **Intervention:** Lay patient in supine and administer a low load, prolonged stretch of at least 3 minutes on shoulder in the flexion and then abduction position.17 Stretch should be held at end range and progressed farther into the range throughout the three minutes.17 Blanching of the associated soft tissue should be noted.1,17 Following this stretching, active range of motion and strengthening exercises are indicated.1 Have child reach forward and upward to grab object 10 times. Increase height of the object as child’s shoulder flexion increases. Complete the same task with child’s shoulder abducting to reach object. Continue stretching and active range of motion protocol for the remainder of child’s stay in hospital and inpatient rehab.1,17

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