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PRACTICE GUIDELINE

PEDIATRIC THERAPY PROGRAM

WAKE FOREST BAPTIST MEDICAL CENTER

SERIAL CASTING

1. The Department of Occupational and Physical Therapy have in place Policy and Procedure for Serial Casting PP-PT/OT-TX-86.2 and use of Cast Saw PP-PT/O –TX-86.3 T for removal of applied casts. These Policies and Procedures will be followed at part of the Pediatric Therapy Practice Guideline for Serial Casting. Serial Casting may involve the ankle/foot, knee, Elbow or hand and wrist.

2. Purpose: Serial Casts are used to position and hold an involved joint for a period of days to increase soft tissue extensibility and joint mobility. Successive casts are applied to gradually bring the joint into a more functional position. Patient safety is paramount therefore knowledge of indications and contraindications for casting, joint anatomy including foot biomechanics, soft tissue structures around the joint, ability to assess soft tissue extensibility and joint configuration and apply posting concepts are part of the Practice Guidelines and Competency Assessment. Competency must be demonstrated and achieved for practitioner to cast independently.

3. Examination/evaluation of patients considered for Serial Casting from birth to 21 years old utilizing the established PT or OT evaluation template.
    a. Identification of Body Structure Impairments and Functional Activity limitations as part of the evaluation process.
    b. Gait assessment with identified abnormalities
    c. Identification of joint biomechanics and malalignment is documented and summarized.
        i. Ankle Foot considerations include but not limited to mobility/limitations in non-weight bearing : Hindfoot eversion/inversion; midfoot pronation supination mobility/limitations; forefoot varus/valgus, abduction/adduction, talocural
        ii. Ankle foot considerations in weight bearing and gait: deviations from neutral and acceptable ranges are noted for talocural, hindfoot, midfoot and forefoot positions.
        iii. Knee joint considerations non- weight bearing: Flexion, extension end range, knee valgus, knee hyperextension.
        iv. Knee joint considerations weight bearing: Degree of flexion in stance or hyperextension during stance phase; knee valgus or varus presentation
        v. Elbow Joint Consideration: degree of flexion/extension available, integrity of joint
        vi. Wrist hand consideration: degree of flexion/extension, ulnar and radial deviation available and integrity of joints
    d. Assessment of tone and spasticity
    e. Functional skill level of patient including motor skills and ADLs.
    f. Goals casting intervention as part of therapy intevention
        i. Increasing joint ROM

ii. Increase mobility of joint and proximal and distal joints
iii. Provide appropriate biomechanical alignment of joint area to optimize muscular activity across the joint for function.

g. Assessment – determination that patient is a candidate for serial casting program based on exam findings, goals and care providers agreement.

4. Documentation
   a. Exam/ evaluation with Assessment
   b. Goals for casting
   c. Progress with each cast applications
   d. Cessation indication for casting

5. Clinical determination that patient is a candidate for the procedure :
   a. Presents with limitation in range and soft tissue extensibility that interferes with function and/or result in disrupted biomechanical alignment.
   b. Is able to tolerate the cast
   c. Ability to improve ROM in the lower or upper extremity due that is limited due to increased muscle tone or contracture.
   d. Able to assist in management of abnormal tone and prevent contracture
   e. To provide distal stability as part of therapy program and assessment for orthotics
   f. Has behavioral control for casting process
   g. Parents are able to provide appropriate oversight and recognize potential issues that need attention during casting process
   h. Will most likely benefit from the casting process

6. Contraindications for casting
   a. Open skin sores/poor skin condition
   b. Chronic uncontrolled posturing (As seen in ABI and near drowning incidents consider with qualifications)
   c. Increased intracranial pressure
   d. Heterotopic ossification of the joint area being casted
   e. Hypertensive patient – caution – apply one cast only and assess
   f. Fixed contracture of long duration
   g. Fractures
   h. Very agitated patient
   i. Inability to monitor patient via care provider after casting.

7. Required Training (See Competency Assessment)
   a. View Serial Casting Power Point Educational presentation
   b. Read Casting Guideline Book from Beverly Cusick Chapter 6 [Progressive Casting and Splinting for LE Deformities in Children with Neuromotor Dysfunction by Therapy Skill Builders 1990
   c. Read APTA Monograph on Lower leg Orthoses and Casts [from Independent Study Course Orthopedic Interventions for Pediatric Patients Lower leg Orthoses and Casts ; Home study course 10.2.3]. Page 10-15
   d. Read Department PP on Serial Casting and Cast saw use Tx-86.2 and TX 86.3

8. Intervention
    a. Coordination of cast application with Orthopedics as part of spasticity management intervention post neuromuscular injections and/or with care providers as part of therapy intervention.
    b. Education
        i. Educate patient and care providers about use of serial cast to gain joint mobility to prevent or minimize deformity and optimize function.
        ii. Provide care provider with written instructions on cast care and checking skin, process for cast removal in emergency and with contact numbers for business hours and after hours.
        iii. Provide HEP during time in cast for stretching to adjacent joints and walking limitations.
    c. Procedural - Casting Application Key Points
        i. Padding
            1. Ankle – Pad with 1/8 inch felt along boney areas of malleoli, along anterior ankle at bend, around heel, on top of toes, under toes optional
            2. Knee – over patella, around edges of cast ends anterior and posterior
            3. Elbow – Olecranon process around to antecubital space, cast ends anterior and posterior. (See Department book : UE Book Regi Boehme) for chapter on UE casting and drop out cast applications).
            4. Wrist and hand – all boney prominences of wrist with felt
        ii. Apply Stockinet first or after taping on felt padding to boney areas, can tape padding over stockinet
        iii. Apply layer of cotton wrap overlapping half each wrap around joint. Be cautious of too much wrap as will compress and cast may become loose increasing risk of skin irritation and pressure.
        iv. Apply a second layer of stockinet over cotton wrap. (Optional)
        v. Position joint in optimal alignment for initial and subsequent casts.
            1. Ankle – Subtalor neutral first position, talocural at or near neutral with subtalor at neutral and forefoot managed with posting as needed.
            2. Knee – in extension at comfortable degree, if casting ankle in addition allow for tolerance of stretch across gastrocnemius over ankle and behind knee.
            3. Elbow – in comfortable flexion or extension depending on goal
            4. Wrist – in Extension with fingers in comfortable degree of extension
        vi. Ankle
            1. Fabricate foot plate – can be done separately prior to padding for boney prominences OR incorporated into casting process

2. Apply Fiberglass roll, can apply plaster layer first and then footplate in place. Ensure footplate holds foot in desired alignment at midfoot and hindfoot with appropriate posting at forefoot to support foot in cast.
3. Roll ends of stockinet over ends of cast to make smooth ends with no pressure from fiberglass contacting the leg or dorsum of the toe/foot area.
4. Wedge heel with extra plaster to bring lower leg perpendicular to surface if 0 degrees at talocural joint cannot be obtained or to control degree of hyperextension at the knee. Wedging of heel can be done when making the footplate or applied under footplate area prior to wrapping with fiberglass layer.
5. Post forefoot as needed to maintain mid and hind foot alignment and bring surface contact to plantar surface of forefoot.
6. Hold position while cast dries.
7. Provide patient with cast boot.
8. Check for skin color and pressure around edges of cast

vii. Elbow, knee and hand follow similar process of wrapping and holding joint in desired position

viii. Cast water is emptied in casting sink in cast room only.

9. Cast Removal - ONLY CLINICIANS WHO HAVE COMPLETED COMPETENCY IN CAST SAW CAN REMOVE A CAST
    a. Care provider informs clinician of any concerns or difficulties with cast wear
    b. Cast is examined for wear and breakage and noted
    c. Patient is prepared for cast removal by explaining that the cast saw will make a noise (similar to things child already is familiar with – vacuum, hairdryer), that the unit will "tickle the leg" and is a funny feeling. Reassure patient and care provider that areas have been padded to protect boney prominences.
    d. Ensure patient can be properly controlled with limb stabilized prior to beginning removal process. Enlist additional staff to aid in process as needed.
    e. Cast saw dust can be irritating – offer face mask.
    f. Plug in cast saw and hold saw distal end griped with fingers on one side and stabilizing with thumb on other side.
    g. A sharp saw blade is moved inward and outward gradually moving up the limb from the toe. The feel of the hard fiberglass gives way to minimal resistance – do not push any deeper past the fiberglass/plaster layer once cut.
    h. Stop at times to allow blade to cool.
    i. Cut through stockinet at edges being careful not to push blunt end of scissors into leg or foot.
    j. Remove cast and padding
    k. Examine foot and leg for any pressure areas

l. Assess ankle and foot mobility

10. Subsequent cast applications
    a. Determine need for additional cast application to achieve goals
        i. Delay cast application if skin breakage or irritation is noted
    b. The joint area is prepared as outlined (9).
    c. Continue with process as outlined in steps (9) and (10).

11. Cessation of casting
    a. Desired mobility has been achieved at the joint
    b. Plateau with increasing mobility – no changes after 2 or 3 cast applications
    c. Plan for maintaining and supporting joint integrity and range with orthotic or splint is made and implemented
    d. Therapy program in place for post cast intervention to maximize functional skills.
    e. HEP for active and passive range activities to promote movement at joint.
    f. Plan to recheck range after discharge from ongoing therapy.

12. Therapists treating this specialty population will have met baseline Competency standard as outlined in the "Serial Casting Competency Assessment".

13. Competency Documentation will be kept:
    a. Therapist department file
    b. Department file for Treatment Competencies

14. Competency for newly employed Therapists will be completed prior to independent treatment of this population except as outlined in Competency process.
    a. Competency should be completed within 12 months of employment
    b. If course availability is limited while working on Competency components, competency can be determined by mentor with additional reading material and/or observations required.

15. Competency of clinician will be reviewed and renewed by successful completion of Competency components every 3 years.

16. New materials for reading added to the existing Competency as part of updating most current Evidence Based information will be required reading for all clinicians treating this population. A check off for current reading material will be added to the clinician's department file and Department Competency file.

17. The Serial Casting Practice Pattern and Competency requirements will be reviewed next by November 2014. Review will be by Competent Clinician in the area in conjunction with Clinical Coordinator and/or Manager.