

Pre/Post Surgical Management

Pre-Surgical Intervention Therapeutic Management

Treatment Goals

- **FAMILY EDUCATION: Top Priority**

including traditional treatment: ROM, scapula and gleno-humeral stabilization

- **PRECAUTIONS/PLANS:**

Positioning/Handling

ADLs: feeding, dressing, bathing

Diagnostic work-up, specialists

Treatment Goals

- Maintain PROM/ minimize axillary contractures
- Obtain AROM
- Preserve joint integrity
- Promote age appropriate developmental skills acquisition

Treatment Goals

- Promote sensory awareness of affected UE
- Promote visual awareness of affected UE (midline)
- Prevent/minimize compensatory patterns of movement
- Monitor potential associated problems:
medial rotation posture/deformity related to muscle imbalances

Treatment-Positioning

Infants:

No longer pinning arm to chest unless fracture present

Position in 90 degrees of external rotation and horizontal abduction

Older infants (4 month +)

Supine and Prone

Shoulder abducted to 90 degrees with external rotation





Tummy Time



Treatment- PROM

- Should be performed through full range as expected for developmental age with careful concentration paid to shoulder flexion/abduction/external rotation.
- Should always support normal scapulo-humeral rhythm
- Please be aware of possible humeral/radial dislocation
- If clavicular fracture present, avoid PROM until cleared by the physician



Treatment-AROM

- Early facilitation of AROM is critical for the prevention of learned nonuse

General Guidelines

- Start in gravity eliminated or gravity assisted position
- Reflexes can be helpful to elicit muscle contraction
- Weakness can develop in muscles not directly affected by the lesion



Treatment-AROM

- Facilitation of shoulder stability is the basis for controlled arm and hand function
- Weight bearing and weight shift in prone with adequate stability. Not done if unstable shoulder
- Assisted reach while in prone



Facilitation of ER

- Gentle stretch to pectorals is essential
- MFR, strain/counterstrain
- Gentle joint mobilization
- Massage
- Trunk rotation while weight-bearing on fixed affected UE
- Reaching out to side with humerus fixed against trunk



Facilitation of Reach

- Stabilizing and mobilizing scapula
- Humeral guidance while facilitating humeral flexion and ER (inhibit excessive humeral abduction)
- Gentle humeral compression during reach
- Facilitate reach without grasp, but reach to touch easier



Facilitation of Supination

- Shoulder should be in a neutral position first
- Gentle humeral compression during reach
- Cylindrically shaped toys presented in vertical fashion
- Present toys to radial side of hand

Facilitation of Supination

- Treatment Strategies

Encourage hand to mouth and toy to mouth play

Finger feeding

Bimanual holding of toys

Banging blocks

Holding bottle at feeds

Stickers on palmar surface or wrist

Weight shifting while in prone





Facilitation of Grasp

- Treatment Strategies

- Toy to mouth

- Traction and proprioceptive input through palm

- Weight bearing through palm/correction of weight bearing through dorsal surface

- Hold large object requiring two hands

- Use velcro strap on hand to maintain hold



Treatment-

Sensory Stimulation

Exploring other body parts

Provide infant massage over affected extremity

Provide vibratory input

Provide joint compression

Provide variety of textures

Alter temperature of toys

Vibration

- Use of vibration can achieve a lot at young age
- Can activate muscle
- Promote sensory awareness
- Assist with nerve re-generation

Treatment-Visual Input

Affected extremity should always be in visual field to reduce the chances of developmental apraxia

Place bell on small wrist band to encourage child to look at arm when spontaneous movement occurs





Treatment- Developmental Sequence

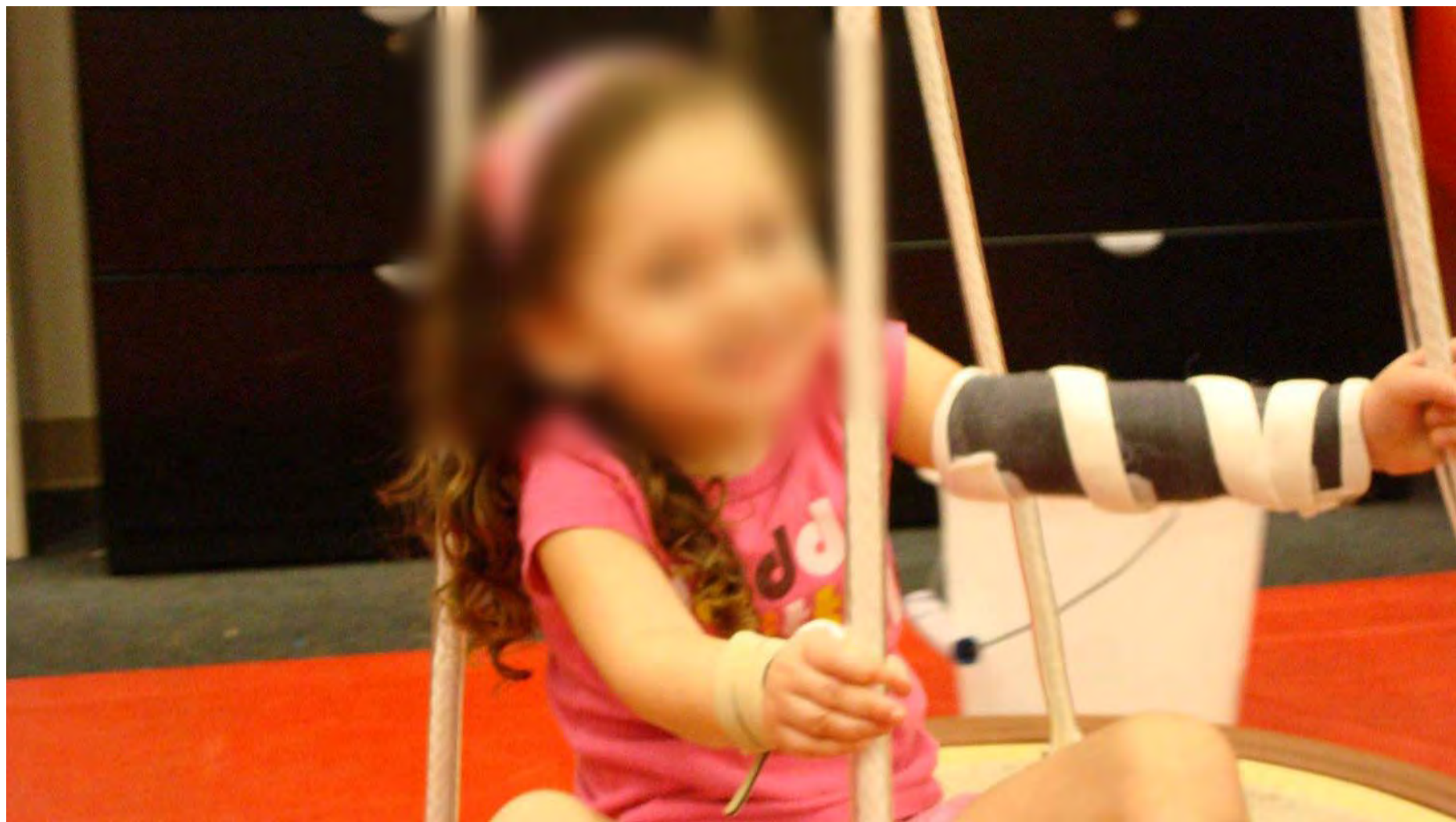
General points of consideration

Utilize age appropriate activities

Keep it fun through variety of stimulation

Insure successful experience

Watch entire body for compensations



Treatment/NMES



Treatment: Constraint-Induced Therapy

Constraint-Induced Video.mpg

Treatment-Splinting

Goals:

Protect joint

Prevent contractures

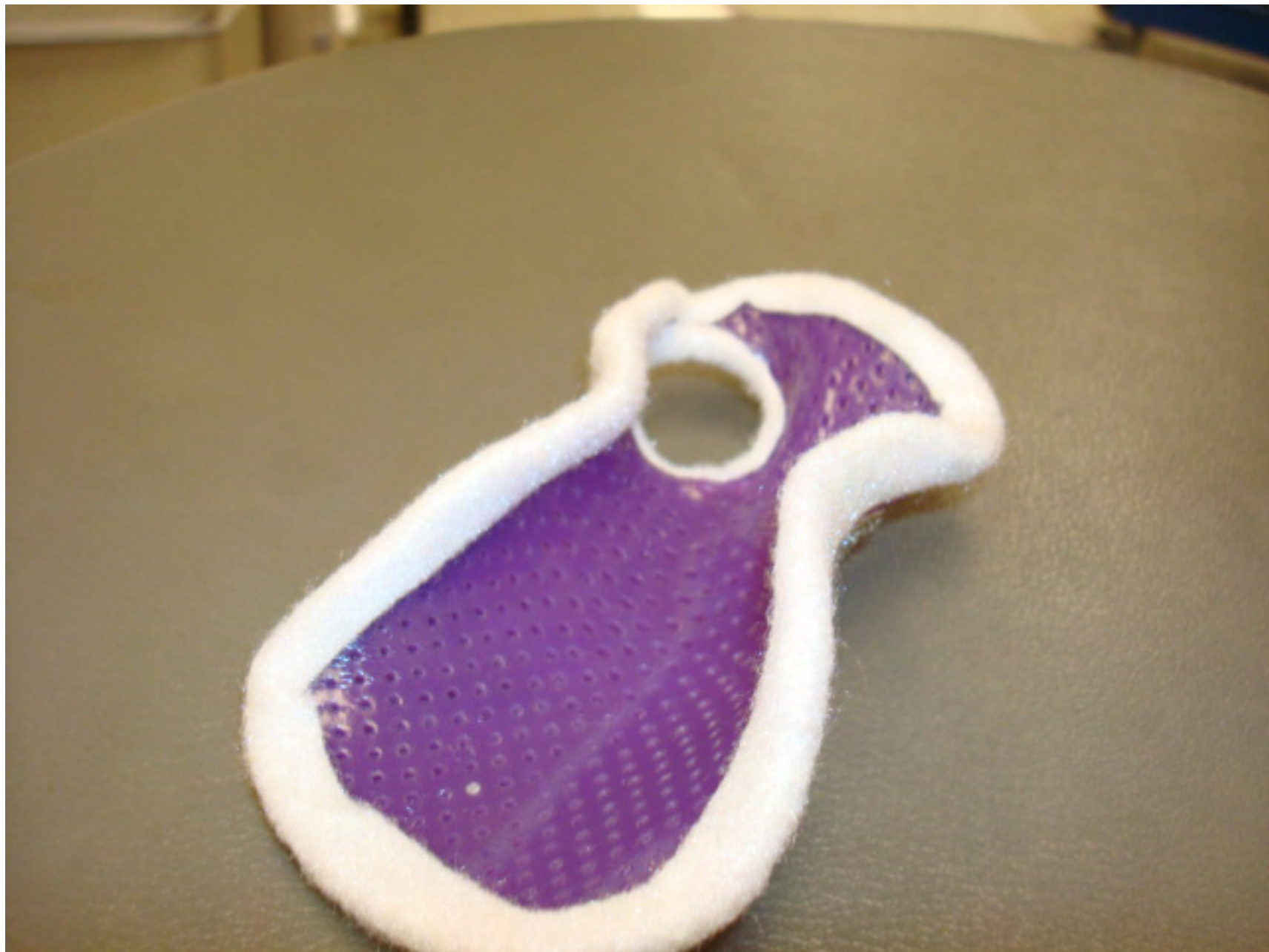
Promote increased function

Deficits determine splinting needs

Not all infants need splinting.











Post-Surgical Interventions

Therapy Intervention Following Mod Quad
Procedure





Post-Surgical Rehab/Mod Quad

- Statue of Liberty (SOL) splint is removed by OT on post-op day #1 to assess current shoulder AROM
- AROM tested anti-gravity & gravity eliminated planes
- Based on AROM findings decision on splint wearing time is made
- AROM might be restricted by pain and dressings
- Typically infants sleep with SOL for 3 weeks

Post-Surgical Rehab/Mod Quad

- Typically infants under 12-18 months do not need splinting during day-time

Splinting at night time only for 3 weeks

- Children 2 + more aware of pain and discomfort
- Might need splinting 18/7 for 1-3 weeks
- Splint is to promote healing and for pain control
- Important to remove splint 1-2 hours at least 2 x day

Post-Surgical Rehab/Mod Quad

- AROM/AAROM begin immediately
- Infant's and younger children restrict AROM on non-affected extremity (elbow splint)
- Children 12+: pillow splint with shoulder at 80/90 degree angle to prevent numbness/tingling
- Protocol for older children varies. Generally AAROM/AROM begins at post-op day #1 and performed every hour

Compensatory patterns big problem for older children

Post Surgical Rehab/Mod Quad

- Formal therapy typically resumes at post-op weeks 2-3
- Encourage active movement and function through play and participation in self-care skills
- Non-resistive activities: balloons, bubbles, magnets
- **Do not encourage medial rotation or adduction at the shoulder**

Post-Surgical Rehab/Mod Quad

- Post-op weeks: 0-3: PROM/AAROM/AROM
To shoulder flexion/abduction/external rotation
- Post-op weeks: 3-6: Therapy might resume
Continue AROM/AAROM
Aquatics might begin
Discourage compensatory patterns of movement

Post-Surgical Rehab/Mod Quad

- Post-op weeks 6 and after
Discontinue night time splint
Scar massage/silicone gels
Assessment of the scapular stabilizers on both sides must
be done prior to begin progressive strengthening

Consider kinesio-taping, theratogs, special braces to
build
and maintain scapular stability
TES/other modalities could be started

Post-Surgical Rehab/Mod Quad

- **Special Considerations**

- Children with shear deformity will continue to exhibit shoulder AROM deficits
- CT scan is ordered at post op week 3 to 6 to assess shear deformity and plan for Triangle Tilt surgery
- TT surgery is typically planned 3-6 months following MQ

Post-Surgical Interventions

Therapy Intervention Following

Triangle Tilt Procedure



Post-Surgical Rehab/Triangle Tilt

- OT perform splint check and family education on TT protocol and post-op day #1
- Saro brace: worn 24/7 without removal for 3 to 6 weeks

This will be pending on severity of shear deformity

- Saro position goal: elbow crease forward with thumb up
- Clear plastic of splint from axillary area
- Splint should be sitting above hip joint unless child is female with breast development



Post-Surgical Rehab/Triangle Tilt

- Post-op dressings are removed by pediatrician at post-op week #1
- Elbow PROM begins at post-op day #2 to prevent elbow stiffness and biceps spasms
- Saro brace is removed at post-op week 3 to 6 at home or therapy clinic
- Heat modalities recommended: hot pack or bath
- Expect loss of ROM at shoulder
- No Saro brace at night until functional AROM at shoulder re-gained

Position of SARO Brace on a Female Teenager



Post-Surgical Rehab/Triangle Tilt

- Send follow up video to Dr. Nath
- Weeks 3-6 to 8: Full PROM and AROM as tolerated
 - Therapy resumes at post-op weeks 3-6 (when saro brace is not longer used)
- Early therapy goals: Increase AROM to shoulder flexion/abduction and elbow flexion



Post-Surgical Rehab/Triangle Tilt

- Weeks 8 to 12:
 - Continue with progressive AROM activities
 - Constraint-induced therapy is recommended with attention paid to maintaining alignment
- All compensatory movements to be discouraged such as hiking the hip, rotating or bending body backward
- Serial casting at the elbow might be started if elbow flexion contracture present *(refer to casting protocol)*

Serial Casting: Before/After



Post-Surgical Rehab/Triangle Tilt

- Weeks 12+: Begin strengthening program
 - Weight bearing as tolerated
- Assess: alignment of the scapula on the rib cage
- Alignment and mobility of the gleno-humeral joint
- AROM/PROM and strength
- Treatment focus initially on strengthening of the scapular stabilizers to promote scapulo-humeral rhythm

Post-Surgical Rehab/Triangle Tilt

- Therapy after TT protocol generally begins with a frequency of 2 x per week but should be modified on a case by case basis

Therapy is recommended for at least 6 months following TT surgery

The following modalities are also recommended
TES/Bio-feedback, kinesio-taping, bracing etc.