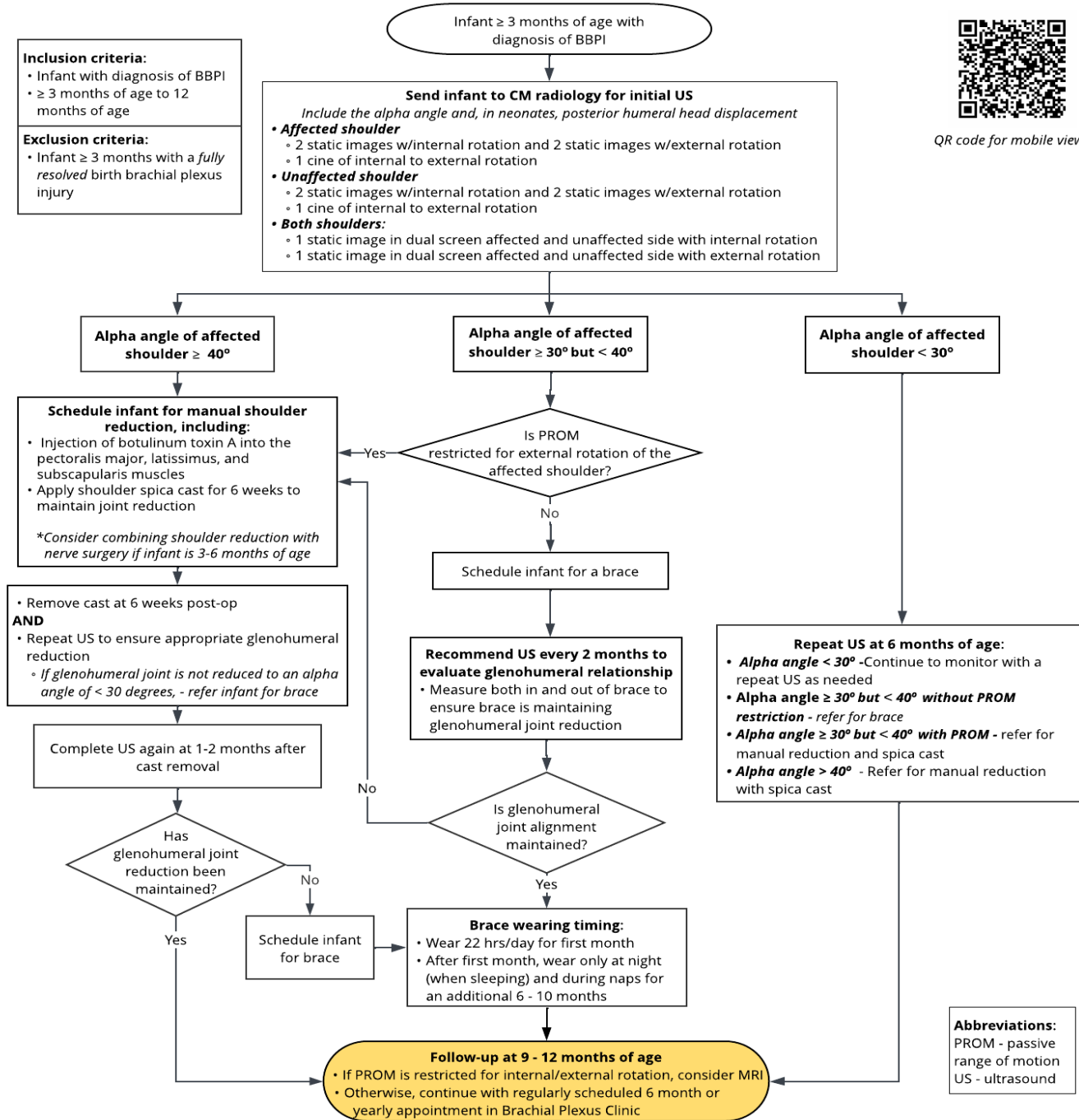


## Birth Brachial Plexus Injury: Management of Shoulder Subluxation/Dislocation Clinical Pathway Synopsis

### BBPI: Management of shoulder subluxation/dislocation



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\* These clinical pathways do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare a clinical pathway for each. Accordingly, these clinical pathways should guide care with the understanding that departures from them may be required at times.

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**Objective of Clinical Pathway**

The objective of the Birth Brachial Plexus Injury (BBPI): Management of Shoulder Subluxation/Dislocation Clinical Pathway is to provide care standards for the infant diagnosed with BBPI and concern for shoulder subluxation or dislocation. The BBPI: Management of Shoulder Subluxation/Dislocation Clinical Pathway provides guidance regarding evaluation, surgical intervention, treatment, and reassessment to minimize variation in care.

**Background/Epidemiology**

BBPI most often, but not always, occurs during the delivery process as the infant descends through the birth canal and the shoulder becomes lodged on the mother's pelvic bone. As contraction begins, the infant's neck and shoulder are stretched which can cause tears or ruptures of the nerves within the brachial plexus thus impacting the sensation and movement of the affected upper extremity. Incidence of brachial plexus injuries in the United States is 0.4 to 4 in 1,000 live births (Abzug, et al., 2018; Foad et al., 2008; Hoeksma et al., 2004; Waters, 1997). Although many of these infants will have spontaneous recovery of their injury within 2 - 3 months, 10 - 30% will have irreversible neuromuscular dysfunction and skeletal deformities (Nikolaou et al., 2011; Waters et al., 1998; Poyhia et al., 2005).

One condition that impacts the shoulder specifically in BBPI is glenohumeral dysplasia. Glenohumeral dysplasia is a complex condition involving an imbalance between shoulder muscles, particularly the internal and external rotators. This can lead to progressive joint abnormalities, such as posterior subluxation and dislocation, causing further disruption in the development and function of the shoulder joint (Ruchelsman, et al., 2011; Olofsson, et al., 2019; Moukoko, et al., 2004). Early diagnosis and appropriate treatment are important to manage this condition and prevent complications (Pearl, 2009; Vuillermin & Bauer, 2016).

**Target Users**

- Radiologists
- Radiology Technicians
- Orthopedic Surgeons
- Physiatrists
- Occupational Therapists
- Orthotists

**Target Population****Inclusion Criteria**

- Infant with diagnosis of BBPI
- $\geq 3$  months of age to 12 months of age

**Exclusion Criteria**

- Infant  $\geq 3$  months of age with BBPI fully resolved

**Practice Recommendations**

National or international clinical practice guidelines have not been established for the care process for patients presenting with birth brachial plexus injuries and shoulder subluxation or dislocation. Practice recommendations are based on the expert opinion and consensus of the providers involved in the care of infants presenting with BBPI and concern for glenohumeral dysplasia.

**Measures**

- Ultrasound ordered
- Referrals to Occupational Therapy for splinting
- Referrals to Hanger Clinic for bracing
- Surgeries scheduled for shoulder reduction

**Value Implications**

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased unwarranted variation in care

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**Organizational Barriers and Facilitators****Potential Barriers**

- Variability of acceptable level of risk among providers
- Challenges with follow-up faced by some families

**Potential Facilitators**

- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of the clinical pathway
- Standardized order set for the ambulatory rehabilitation clinic

**Diversity/Equity/Inclusion**

Our aim is to provide equitable care. These issues were discussed with the Committee and discussed prior to making any practice recommendations.

**Power Plans**

- Ambulatory Rehab Brachial Plexus Pathway

**Associated Policies**

- No policies were identified to be directly associated with the Birth Brachial Plexus Injury: Management of Shoulder Subluxation/Dislocation Clinical Pathway

**Education Materials**

- Education will be provided for brace wear from either the Occupational Therapist or the Orthotist

**Clinical Pathway Preparation**

This product was prepared by the Evidence Based Practice (EBP) Department in collaboration with the BBPI: Management of Shoulder Subluxation/Dislocation Clinical Pathway Committee composed of content experts at Children's Mercy Kansas City. The development of this product supports the Quality Excellence and Safety Division's initiative to promote care standardization that is evidenced by measured outcomes. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

**Birth Brachial Plexus Injury: Management of Shoulder Subluxation/Dislocation Clinical Pathway Committee Members and Representation**

- Christine Cheng, MD, MPH | Orthopedic Surgery | Committee Co-Chair
- Kimberly Hartman, MD, MHPE | Rehabilitation Medicine | Committee Co-Chair
- Kay North, DO | Radiology | Committee Member
- Stacey Weaver, BSRT (R)(M), ARDMS (ABD)(OBGYN)(VAS) | Radiology | Committee Member

**EBP Committee Members**

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Andrea Melanson, OTD, OTR/L | Evidence Based Practice

**Clinical Pathway Development Funding**

The development of this clinical pathway was underwritten by the following departments/divisions: Orthopedics, Rehabilitation, Radiology, and Evidence Based Practice.

**Conflict of Interest**

The BBPI: Management of Shoulder Subluxation/Dislocation Clinical Pathway contributors have no conflicts of interest to disclose related to the subject matter or materials discussed.

**Approval Process**

- This product was reviewed and approved by the BBPI: Management of Shoulder Subluxation/Dislocation Clinical Pathway Committee, Content Expert Departments/Divisions, and the EBP Department, after which the Medical Executive Committee approved them.
- Products are reviewed and updated as necessary every 3 years within the EBP Department at CMKC. Content expert teams are involved with every review and update.

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**Review Requested**

Department/Unit	Date Obtained
Orthopedics	October 2023
Occupational Therapy	October 2023
Orthotics and Prosthetics	October 2023
Rehabilitation Medicine	October 2023
Radiology	October 2023
Evidence Based Practice	October 2023

**Version History**

Date	Comments
October 2023	Version one – new pathway with algorithm and synopsis supported by content expert consensus; the current power plan was revised to meet the specifications of the new pathway

**Date for Next Review**

- October 2026

**Implementation & Follow-Up**

- Once approved, the pathway was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.
- Order sets/power plans consistent with recommendations were created for each care setting.
- Education was provided to all stakeholders:
  - Department of Orthopedics, Rehabilitation Medicine, and Radiology
  - Providers from Occupational Therapy and Orthotics and prosthetics
- Additional institution-wide announcements were made via email, the hospital website, and relevant huddles.

**Disclaimer**

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) accompanying the clinical pathway.

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