

# Orthopedic Center

## Hand and Orthopedic Upper Extremity Program

### Arthrogryposis

Whether your child or loved one suffers a broken arm, a sports-related injury or the most complex spine condition, the Orthopedic Center at Boston Children's Hospital is committed to providing comprehensive and compassionate care. Established in 1903, we are among the world's most experienced pediatric orthopedic programs, treating a high volume of some of the most complex orthopedic conditions. And with 13 specialty clinics, we are the largest in the country. We are also one of the busiest. Each year, our staff attends to about 100,000 patient visits and conducts about 6,000 surgeries.

The Hand and Orthopedic Upper Extremity Program provides comprehensive care for infants, children and adolescents with a wide range of complex upper limb conditions. Multidisciplinary care involving occupational and physical therapy, splinting, casting and reconstructive surgeries is provided for congenital, neuromuscular, sports-related oncologic, traumatic or post-traumatic conditions.

#### What is Arthrogryposis?

Arthrogryposis is a term used to describe a number of rare, non-progressive conditions characterized by stiff joints and abnormal muscle development. It is also referred to as arthrogryposis multiplex congenita or amyloplasia.

#### What causes arthrogryposis?

The exact cause of arthrogryposis is unknown, though a number of different theories have been proposed. Some believe that arthrogryposis is caused by mechanical obstructions to intrauterine movement during pregnancy. Others believe that it may be a result of an early viral infection during development. Still others believe that arthrogryposis is the result of failure of the central nervous system and/or muscular system to develop appropriately. Arthrogryposis is not thought to be a genetic or hereditary condition.

#### How common is arthrogryposis?

Arthrogryposis is a rare condition, though the exact frequency with which it occurs is unknown. Previous studies have estimated that it affects one to three of every 10,000 live births.

#### How is arthrogryposis diagnosed?

Arthrogryposis is diagnosed by treating physicians after a thorough medical history and careful physical examination. X-rays are often taken to confirm the diagnosis and to evaluate stiff or dislocated joints. Additional tests, including blood tests, muscle biopsies, and other imaging studies, are often used to further make the diagnosis. Patients with arthrogryposis often have involvement of the upper limbs. Typically, these patients will have shoulders that are internally rotated and adducted, elbows that are stiff in extension or flexion, and wrists and fingers that are flexed.

#### How is arthrogryposis treated?

Early in life, patients with joint abnormalities are typically treated with stretching exercises and splinting to improve motion. Splinting and occupational/hand therapy are the treatment of choice for patients with mild to moderate deformity.

Some patients may have persistent functional difficulties despite a rigorous physical therapy regimen. In certain situations, surgery is recommended to improve limb position and function. These procedures may include muscle releases, tendon transfers, or bony fusions. Posterior elbow release and triceps lengthenings, for example, may be performed after two years of age to improve elbow flexion.

Tendon transfers to restore active elbow flexion may be considered in some children after five to seven years of age. Wrist flexion deformities may be treated with tendon transfers and/or bony procedures to change the alignment of the wrist. Finally, surgical procedures to rearrange the skin between the thumb and index finger may benefit selected patients with tightness between the thumb and palm. While improvements can be made, most patients will have persistent muscular and/or joint limitations due to the underlying condition.

## Clinical Team

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