At the OrthoCarolina Congenital Hand & Upper Extremity Clinic, we use a multidisciplinary approach in caring for congenital differences that affect the hand, wrist, forearm, elbow, upper arm and shoulder.
Many children are born with congenital differences in particular parts of their body.

Typically, these differences develop in the mother’s uterus during the baby’s growth and are due to genetic differences. Occasionally, these differences are detected before birth (during an ultrasound, for instance). Most commonly, they are noticed after the child is born. Some differences are passed from generation to generation, while others are entirely spontaneous and random.

Most children that we treat have isolated upper extremity conditions; however, for some children it may be part of a syndrome that includes other medical or orthopedic problems such as heart, kidney, spine or lower limb abnormalities. Many of these conditions are quite rare, occurring only a few times a year countrywide. Each child has a unique situation, which requires a personalized approach and solution.

The OrthoCarolina Congenital Hand & Upper Extremity Clinic multidisciplinary approach includes several healthcare providers attending each clinic. These providers include three fellowship-trained hand surgeons with expertise in congenital hand problems, a pediatric orthopedist, a pediatric neurologist, and hand therapists. Children are examined by several physicians within the same visit, allowing us to provide state-of-the-art, customizable care.

TYPES OF CONGENITAL HAND AND UPPER EXTREMITY DIFFERENCES

There are several categories or congenital hand differences:

- Duplication (extra fingers).
- Lack of separation (fingers fused together).
- Lack of full formation (for example, one arm shorter than the other).
- Congenital amputations involving the upper extremity (for example, below elbow amputations, or other amputations involving the hand or fingers)
- Overgrowth (for example, one finger noticeably larger than the rest)
- Undergrowth (for example, one finger noticeably smaller than the rest)
- Constriction bands (a unique category, where a tight “ring” forms around a particular part of the body)

Certainly, many hands and arms that have congenital differences fall under more than one of the above categories. While many of our patients have very similar differences, each patient, each hand, and each arm is unique.

SOME SYNDROMES AND DIAGNOSES SEEN AT THE CONGENITAL HAND CLINIC

- Arthrogryposis (upper limb evaluation and treatment)
- Aperts
- TAR syndrome (Thrombocytopenia with Absent radius)
- VACTERL or VATER
- Fanconi anemia (upper extremity problems associated with)
- Complex syndactyly
- Lobster claw hand
- Phocomelia
- Congenital below elbow amputation
- Other amputations of the upper extremity (traumatic or congenital)
- Absent thumb
- Synostosis of the radius and ulna
- Physisal bar or growth arrest in the upper extremity
- Madelung deformity
- Volkman’s ischemia
- Brachial Plexus Palsy
Common Hand & Upper Extremity Differences

**POLYDACTYLY**
Polydactyly, meaning “extra fingers”, is one of the two most common types of congenital hand differences (see picture). This falls under the category of “Duplication”. Most commonly, there is one extra finger next to the pinky, or there is an extra thumb, and usually this is not quite a “full” extra finger. However, polydactyly can occur pretty much anywhere in the hand, and there can be more than just one extra finger. Sometimes, both the left and right hands are affected. Polydactyly can be treated with surgical removal of the extra finger(s), which is often a very simple procedure, but can involve a more complicated reconstruction of other fingers or the hand.

**SYNDACTYLY**
Syndactyly, meaning fingers “fused” together, is the other most common congenital hand difference. This falls under the category of “Failure of Separation”. The fingers may be only partially fused, or entirely fused all the way to the fingertip, including the finger nail. Syndactyly can affect just two fingers or up to all five fingers. The most common type of syndactyly is between the ring and middle fingers (see picture). Syndactyly can be treated by surgical separation of the fingers, which is often done with just one surgery, although with more complicated hands (such as those with more than two fingers fused), it may require more than one surgery. Often, skin grafting (borrowing a small piece of skin from another part of the body) is required, as once the fingers are separated, there isn’t enough skin to entirely cover the fingers.

**RADIAL CLUB HAND**
Radial club hand (also known as Radial Dysplasia) is a congenital difference where the radius bone of the forearm (the bone on the thumb-side of the forearm) either forms incompletely, or doesn’t form at all. The result is a forearm that is slightly shorter and bowed, a stiff elbow, and often with a small or missing thumb. (see picture) This condition ranges from very mild (barely noticeable) to very severe. Many babies that are born with this condition will be affected on both sides, although often not equally in terms of severity. Your doctor will discuss with you that this congenital difference is often associated with other symptoms of other parts of the body (i.e. it can be part of a syndrome). Treatment of this condition can range from observation for more mild cases, and complex repair and reconstruction for the more severe cases.

**CONSTRICITION BANDS**
Constriction bands (also known as Amniotic Bands) are thick, tight “rings” that wrap partially or entirely around an arm, hand, leg, foot, or digit, (see picture) and these occur in approximately 1 in 1,200 babies. Some cases are very mild, causing minimal narrowing of the extremity, whereas other cases can be quite severe, where the blood supply to the rest of the extremity can be partially or completely cut off. For this reason, this condition can occasionally, and unfortunately, cause a part of the limb to be amputated. Constriction bands can occasionally be detected before birth (i.e. with an ultrasound), but usually it’s not noticed until after the child is born. Treatment is either simple observation (for very mild cases), or surgical repair and reconstruction (releasing the tight constriction ring).
There are dozens of other congenital differences of the hand and upper extremity that can occur, just not as commonly as those already described. Some differences are so rare that only a few occur per year in the world.

**BIRTH BRACHIAL PLEXUS PALSY**

One condition that we treat here that is not truly “congenital” is called “Birth Brachial Plexus Palsy.” The brachial plexus is a large group of nerves in the neck and just beneath the collar bone. These nerves are the “wires” that connect the brain to all of the muscles in the arm and hand. During child birth, these nerves can be stretched, or even torn, resulting in an upper extremity that lacks the normal “electrical signals” to its muscles. This is typically noticed immediately after birth, as the baby will not move the many parts of its arm or hand like he or she is supposed to. Fortunately, more than half the time, these nerves will heal and the function of the muscles will recover during the first few weeks or months of life. However, in many cases, the nerves don’t adequately heal, requiring surgery to repair the nerves and/or to restore function to the upper extremity. This is a serious, but treatable, condition that requires close monitoring.

**Meet Our Congenital Hand & Upper Extremity Team**

We take a team approach here at the OrthoCarolina Congenital Hand & Upper Extremity Clinic. The members of our team include Hand and Upper Extremity Surgeons, Pediatric Orthopaedic Surgeons, Occupational Therapists, Physical Therapists, Neurologists and Physiatrists. Additionally, we also work closely with your child’s pediatrician and other physicians to make sure that all appropriate doctors are included in your child’s care.

**For more information, visit orthocarolina.com**