

DOWNLOAD PDF UPPER LIMB (EXTREMITY : FINGERS, THUMB, HAND, WRIST, FOREARM, ELBOW, AND PEDIATRIC UPPER LIMB

Chapter 1 : Upper limb - Wikipedia

The upper limb, also called the upper extremity includes the: fingers, thumb, hand, wrist, forearm, elbow, humerus, and shoulder girdle. The hinge joints that connect the phalanges are called the _____ and are distinguished as proximal and distal.

Upper extremity tenosynovitis is a condition affecting the tendons of an upper extremity limb. It also affects the lining of the sheath around the tendon synovium. Tendons are cords of tissue that connect muscles to the bones. With upper extremity tenosynovitis, the sheath and the synovium of the flexor bending muscles become inflamed swollen. The tendons may also become thickened and have a hard time moving through the swollen covering. This may cause pain and tenderness when moving the affected upper and lower arm, hand, wrist, finger, or thumb. This condition usually affects women, athletes, and people of middle age or older. With treatment, such as medicines, a splint, rehabilitation, or surgery, you may be able to resume your normal daily activities. What causes upper extremity tenosynovitis? The exact cause of most upper extremity tenosynovitis remains unknown. The following are possible causes or conditions that may increase your risk of getting upper extremity tenosynovitis: Calcium may be deposited in the tendons due to decreased oxygen and poor blood supply. These deposits may cause irritation and swelling of the tendon and its covering. Incorrect arm or hand movements, or weak flexor muscles may cause the tendon to become trapped. This may also happen in people who overtrain or have a sudden change in arm or hand activity. Germs, such as bacteria or fungi, may often cause upper extremity tenosynovitis. The infections may result from wounds, bites, or intravenous IV drug abuse. Upper extremity tenosynovitis may also be caused by frequent, repeated movements of your upper extremity. Jobs that may cause this condition include piano playing, cutting meat, sewing, or dentistry. Skin injuries or a direct blow to the extremity may damage the tendon and cause scar tissue to be formed. This scar tissue can make the tendon thick and unable to stretch or move very well. The immune system is the part of your body that fights infection. A problem with the immune system sometimes makes your body weak and unable to fight infections. If you have a wound infection, you may be more likely to develop upper extremity tenosynovitis. These diseases may include diabetes, rheumatoid arthritis, gout, or problems with the thyroid gland. What are the types of upper extremity tenosynovitis? The following are different types of upper extremity tenosynovitis: It usually affects the tendons that control the thumb. Knitting, sewing, typing, and piano playing may cause this condition. Lifting small children and playing sports, such as wrestling or bowling, may make this condition worse. Ask your caregiver for more information about de Quervain disease. This may be an acute or chronic long-term condition. This is usually caused by an acute bacterial infection of the tendon coverings. The infections are often caused by trauma or may have spread from other parts of the body through the blood, such as active pulmonary tuberculosis TB. This condition happens when you have a long-term mycobacterial germ or fungal infection. It is often a result of a wound infection coming into contact with contaminated water in swimming pools or fish tanks. A trigger finger is also called digital stenosing tenosynovitis. This occurs when the tendons that help bend the fingers and thumb get stuck in a bent position. Your thumb or ring finger straightens with a snap, just like a trigger being pulled and released. What are the signs and symptoms of upper extremity tenosynovitis? There is usually pain, redness, or swelling in your affected arm, hand, wrist, finger, or thumb. The pain usually occurs when you move them up and down, while grasping an object, or making a fist. Over time, the pain may become worse and may be present even at rest. You may also have any of the following: Clicking, locking, or snapping of fingers. Grating sound or feeling when the hand is touched or rubbed. Nodule bump may be present or your fingers may look like sausages. Joint pain or tenderness. Stiffening of fingers or thumb. Weakness, pain, swelling, and limited movement of the affected part. How is upper extremity tenosynovitis diagnosed? You may need any of the following: Your caregiver may have to move your shoulder, arm, hand, wrist, fingers, or thumb in certain directions. He will check to see if you have any pain, weakness, or movement problems. He

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may also check your other upper extremity for any pain, weakness, or movement problems. Biopsy and culture test: A biopsy may be done by taking fluids out through a needle. Your caregiver may also do a minor surgical procedure to take a biopsy of one or more tendons. The fluid or the tendon biopsy will then be taken to a lab and tested. You may be given dye before the pictures are taken in some of these tests. The dye is usually given in your IV. The dye may help your caregiver see the pictures better. People who are allergic to iodine or shellfish lobster, crab, or shrimp may be allergic to some dyes. Tell the caregiver if you are allergic to shellfish, or have other allergies or medical conditions. An arthrogram is an x-ray that is taken after dye is injected into your affected joint. This test is used to view the structures of your joint such as muscles, ligaments, tendons and cartilage. The dye helps your caregiver see the structures better. People who are allergic to iodine or shellfish lobster, crab or shrimp may be allergic to some dyes. Tell the caregiver if you are allergic to shellfish or have other allergies or medical conditions. A special x-ray machine uses a computer to take pictures of your upper extremity. Magnetic resonance imaging scan: This is also called an MRI. An MRI uses magnetic waves to take pictures of the shoulder, upper and lower arm, wrist, and hand area. This may help your caregiver decide if you have upper extremity tenosynovitis, or another condition that is affecting your limb. An ultrasound is a simple test that looks inside of your body. Sound waves are used to show pictures of your organs and tissues on a TV-like screen. Caregivers may also look for fluid near the area of your pain and redness. You may also be able to hear your blood flow during this test. You may need x-rays of your upper extremities to check for broken bones or other problems. X-rays of both your painful and non-painful upper extremities may be taken. How is upper extremity tenosynovitis treated? Treatment will depend on your symptoms and the length of time you have had them. Your caregiver may want you to limit movement of your affected upper extremity to decrease stress on the tendon. This may help prevent further damage, decrease pain, and promote tendon healing. You may also have one or more of the following: Immobilization is an important treatment that allows the tendon and its covering to heal. A splint may be used on the affected part to immobilize it. This helps to decrease pain and prevent the tendons from being damaged further. This is done by cleansing an open wound. It is important to clean and remove objects, dirt, pus, or dead tissues from the wound. Your caregiver may give you medicines to decrease the pain and swelling in your hand, wrist, or thumb. Other medicines, such as antibiotics or anti-fungals, may be given to fight infections. You may need surgery if your symptoms do not go away with other treatments. Surgery may also be done if your pain gets worse or is so severe that it affects your daily activities. This is a program that may include physical and occupational therapy to help your condition heal faster. When the swelling has gone down, you may be given exercises to do. These exercises will bring back the normal range of motion of your upper limb and strengthen your tendons. Your caregiver may also ask you to make changes in your activities to decrease stress on the tendons. These changes may prevent this condition from happening again.

Chapter 2 : Comprehensive Hand Surgery Center

The upper limb, also called the upper extremity, includes the fingers, thumb, hand, wrist, forearm, elbow, Comments Off on Upper Limb and Shoulder Girdle.

Arthritis Arthritis is condition that involves the breakdown of the protective cartilage around the joints, which results in pain, stiffness and inflammation. Learn more about Arthritis Bicep Tendon Injury Our biceps muscle provides considerable strength to bend our elbow and rotate our forearm. An injury to your biceps tendon can cause significant arm weakness and cramping pain during routine recreational and vocational activities. Learn more about Bicep Tendon Injury Carpal Tunnel Syndrome Carpal tunnel syndrome CTS is a condition brought on by increased pressure on the median nerve at the wrist also referred to as a pinched nerve in the wrist. Learn more about Carpal Tunnel Syndrome Congenital Hand Defects Babies born with hands that are different than the normal hand have a congenital hand difference. Some congenital hand differences may occur due to a genetic cause. Many congenital hand differences just occur without an apparent cause. Learn more about Congenital Hand Defects Cubital Tunnel Syndrome Cubital tunnel syndrome is a compression injury to the ulnar nerve near the elbow. This is typically caused by overuse especially from activities that require forceful gripping while flexing and extending the wrist. The ring and little fingers are the two most commonly affected digits. Learn more about Epicondylitis Fingertip Injury Fingertip injuries are one of the more common injuries in the hand. The fingertips are vulnerable to cuts, tears, and crushing injuries that can damage the skin, soft tissues, nail or nailbed. When this happens, there is pain, swelling, and decreased use of the injured part. Learn more about Ganglion Cysts Mallet Finger Mallet finger is an injury to the extensor tendon that is responsible for straightening the finger. This type of injury is most commonly caused by direct trauma to the extended finger such as when a ball strikes the end of the finger during sports. Learn more about Mallet Finger Nerve Injuries The hand has an intricate network of nerves that allow us to perform fine motor movements. Damage to any of these nerves can disrupt normal functions of the hand and cause numbness and pain. Learn more about Nerve Injuries Osteochondritis Dissecans of the Elbow Osteochondritis dissecans of the elbow occurs when a portion of bone or cartilage is cut off from its blood supply. Learn more about Osteochondritis Dissecans of the Elbow Sprain and Strain Sprains and strains are among the most common injuries in sports. A sprain is caused by direct or indirect trauma a fall, a blow to the body, etc. Learn more about Sprain and Strain Tendon Injuries Our orthopedic hand, wrist and elbow specialists are experts in the treatment of hand and upper extremity tendon injuries, including extensor tendon injuries and flexor tendon injuries. The TFCC may be injured during a fall on an outstretched hand. Learn more about Trigger Finger Ulnar Collateral Ligament UCL Injury The ulnar collateral ligament is located on the inside of the elbow and is typically an injury seen in throwing athletes. UCL sprains are caused by repetitive strenuous motions such as throwing a football or baseball. These motions can put stress on the ligament causing inflammation and small tears within the ligament.

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Chapter 3 : Orthopedic Hand, Wrist & Elbow Conditions

No matter the problem affecting the hand, wrist, shoulder or elbow, specialists with the Robert A. Chase Hand & Upper Limb Center are available to provide a comprehensive evaluation and customized treatment plan.

Choosing a myoelectric arm or hand can be confusing and our goal is to help make your decision easier. Our Upper Limb Specialists are trained on the latest technology, and we have many demonstration units to help you find the best fit for your lifestyle and goals. Our prosthetists will share the features and benefits of popular hands by letting you try several models. Myoelectric technology has evolved but some limitations still exist. Myoelectric prosthetic users who need water resistance and additional durability could benefit from an electronically controlled hook. For maximum durability and waterproof functionality, a body-powered prosthesis could be the best option for your primary prosthesis. A silicone prosthesis could be the best choice if you want a prosthesis that looks more natural. Schedule a free evaluation to learn about myoelectric prosthetic arms and hands. Sensors or electrodes in the prosthetic socket detect your muscle contractions and send commands to operate the high performance, battery-operated prosthetic motors. The speed and strength of your muscle contractions determine how the prosthetic components move. Traditional myoelectric control systems use two electrode sites to sense muscle contractions from two major muscle groups. New myoelectric control systems are constantly being introduced and we can show you how the newer systems can help most prosthesis wearers.

CoApt Myoelectric Control System The CoApt Pattern Recognition System allows more grip patterns by using up to eight pair of electrodes to sense contractions in your large and small muscles. The CoApt system recognizes these patterns of muscle contractions and makes control of your prosthesis more natural.

Targeted Muscle Reinnervation Targeted muscle reinnervation, or TMR, is a surgical procedure that helps people with below elbow, above elbow or shoulder amputations achieve better control of their prosthesis. TMR reassigns nerves to different muscle groups that can function in place of lost muscles. This surgery is sometimes combined with pattern recognition and it can be used for phantom pain control. TMR is now performed at most major hospitals, and our Upper Limb Specialists can refer you to a qualified surgeon.

Muscle Transfers People with partial hand amputations could benefit from individual finger control in a myoelectric hand. A groundbreaking procedure called muscle transfer can help by moving remaining finger muscles to the back of the hand and wrist without damaging nerves and blood vessels. Learn how Hanger Clinic built a prosthesis with individual finger control after OrthoCarolina completed a muscle transfer surgery.

Other Electrically Controlled Systems Some prosthetic users may have difficulty making muscle contractions to control a myoelectric arm. For those who struggle with traditional electrode systems, Hanger Clinic can use any combination of pressure switches, rocker switches, sensor pads and linear transducers to obtain the best myoelectric control. For further research on myoelectric controls, please view the first 20 minutes of the Amputee Coalition webinar on Myoelectric Controls hosted by Blair Lock of CoApt. Learn how myoelectric prosthetic arms and hands can help you by scheduling a free evaluation. The LUKE Arm claims to provide greater functionality by providing grip force sensors and by allowing simultaneous control of the shoulder, elbow, wrist and hand. The Modular Prosthetic Limb has more than sensors so it can mimic many movements of the human arm and hand. There are currently six MPLs being used for neurorehabilitation research across the United States and four more are in development.

Osseointegrated Prostheses Osseointegration is a surgical procedure that eliminates the prosthetic socket. A titanium post like those used in knee replacements connects directly to your bone. The FDA is currently evaluating the procedure, which was originally developed in Europe. Simple 3D printed devices are still experimental, but professional prosthetists also use 3D printing to expand the range of available prosthetic solutions. We encourage you to visit any Hanger Clinic location for a complimentary evaluation. Please visit our page on paying for your prosthesis if you need help paying for your prosthesis.

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Chapter 4 : Bionic Myoelectric Arm Hand Prosthesis - Hanger Clinic

The forearm bone located on the lateral or thumb-side in anatomical position Radius The forearm bone located on the medial side of the hand in anatomical position.

Upper Limb Difference What We Treat Children with limb differences are all unique, which means their treatment should be individualized to meet the needs of each child and family. An upper limb difference can be classified as: Failure of formation Too many bones and fingers Too few bones and fingers The Limb Deficiency Program offers comprehensive evaluation, state-of-the-art prosthetic and orthotic devices, and therapy to meet the ongoing functional demands of growing, active children with congenital or acquired upper extremity limb differences. Our program can treat many of the various types of upper limb differences, including: Transverse deficiencies Above the elbow: This is an arm difference that occurs during development in utero in which a portion of the arm above the elbow does not develop properly. This can occur immediately above where the elbow may be or higher up the arm and it typically involves only one arm. There is no family or genetic link to this condition. Depending on the age and goals of the patient, a prosthesis can be worn. This is an arm difference that occurs during development in utero in which a portion of the arm below the elbow does not develop properly. This can occur anywhere along the length of the forearm and typically involves only one arm. Longitudinal deficiencies of the forearm Radial deficiency: There are two bones that make up the forearm. When all or a portion of the radius the bone on the thumb side of the forearm is missing, this can be due to a condition called radial longitudinal deficiency. When this condition is present, there may also be a spectrum of problems with the thumb ranging from normally functioning to absent thumb. Surgery is often performed to improve overall alignment of the wrist. If other differences exist, such as the thumb, surgery can be performed in order to help its function or create a finger to work like a thumb. When all or a portion of the ulna the bone on the small finger side of the forearm is missing, this can be due to a condition called ulnar longitudinal deficiency. Sometimes small and ring fingers may also not develop. This condition occurs sporadically and surgery may sometimes be performed to improve position of the wrist and forearm. Deficiencies of the hand Cleft hand: Children may be born with a widened space between their fingers, or have missing middle fingers. This condition is called cleft hand. This is typically a genetic condition but can also occur spontaneously. Some children may function well with grasp and may not need surgery to improve this function. When treated surgically, reconstruction can be performed to narrow the webspace. Cleft hand, atypical symbrachydactyly: This is a condition where the hand may be smaller than normal, and fingers may not fully form and interconnected. The fingers can be variable in length and functional capacity. The thumb is usually spared and typically only one hand is involved. This occurs spontaneously or in association with Poland syndrome. Surgery can be done in some circumstances to help the hand be able to pinch better. Some examples of surgery include deepening the thumb webspace, finger lengthening or a toe-to-finger transfer. Surgery varies from hand to hand. Prostheses may be helpful for certain activities on a patient-specific basis. This is a condition in which two or more fingers are stuck together, have no webspace and are unable to separate. Often, fingers remain attached by skin only but sometimes the bones, nerves and blood vessels can be involved between two fingers. The cause of this condition can be spontaneous, genetic or occur with other conditions. In most circumstances, surgery can be performed to separate the fingers. There is usually not enough skin to split the fingers, so skin is usually taken from somewhere else to help cover the deficit. Sometimes when bones are involved, separating fingers may compromise the function of the hand. Deficiencies of the fingers Clinodactyly: This is when just the tip of the finger is curved, typically in the direction pointing toward the thumb. This can occur spontaneously, genetically or in association with Down syndrome. The finger typically functions very well. Surgery may be considered for fingers that overlap when trying to grip. This occurs when a finger is unable to be straightened out. It most commonly occurs in the small finger. It is a spontaneous condition, but can be genetic. Management is commonly conservative, with

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stretching and splinting as directed by therapy. When contracture is severe, surgery is occasionally performed to straighten the finger. This is when the tip of the finger has a more curved appearance than other fingers. It is a spontaneous condition, but can also be genetic. These fingers typically function very well. Surgical intervention may be warranted if the shape of the finger impedes function. Amniotic band Hand and finger amniotic bands: The pattern of injury is variable but can result in amputating fingers, connecting fingers syndactyly or nerve dysfunction depending on locations of the bands. The thumb is typically not involved. The cause is not entirely understood and happens sporadically. Services We Offer Children are treated in a multidisciplinary program specializing in the diagnosis and treatment of children with upper limb differences.

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Chapter 5 : Upper Limb Difference | Children's Healthcare of Atlanta

Choosing a myoelectric arm or hand can be confusing and our goal is to help make your decision easier. Our Upper Limb Specialists are trained on the latest technology, and we have many demonstration units to help you find the best fit for your lifestyle and goals.

Our Center also has extensive experience in congenital hand surgery. Radial club hand With this condition, the radius bone is partially or completely missing. Because of this, the hand and wrist, which normally sit on the end of the radius, are displaced to the side of the ulna. Instead of trying to centralize the hand on the end of the ulna all at once, we combine open surgery to lengthen some of the tight soft tissues with gradual correction using an external fixator to progressively stretch the tight nerves, blood vessels, and tendons while centralizing the hand. We think this is a much more successful and safe procedure. Even with successful centralization, the deformity often recurs because of failure to transfer a tendon to maintain the correction. We perform the tendon transfer at the same time. Because many children with radial club hand are born without a thumb, we perform an additional operation to create a thumb from the index finger. This is called pollicization. The results of this approach have been very satisfactory. We perform this surgery when the patient is as young as 1 year, shortly after completing the centralization. Because the forearm in these patients remains very short, we lengthen the forearm for the first time when the patient is between the ages of 6 and 8 years and for the second time when the patient is between the ages of 12 and 14 years. Syndactyly We have developed a new method for the treatment of syndactyly webbing of the fingers. This involves pulling the fingers apart, using an external fixator. This grows new soft tissues between the fingers, making surgical separation of one or more fingers safer and reducing the need for skin grafting. With this approach, both the functional and aesthetic results are very satisfactory. Short humerus This condition is most commonly due to damage of the growth plate of the humerus from infection, bone cyst, or fracture. The humerus on one side can be 5 to 17 cm shorter than the humerus on the other side. In most cases, the arm length discrepancy can be corrected in one lengthening. Associated deformities of the elbow or shoulder can also be corrected at the same time.

Chapter 6 : Upper Limb and Shoulder Girdle | Radiology Key

Combining an assessment of shoulder, elbow, forearm, wrist, thumb, and finger abilities and disabilities helps provide the physician with an overall plan of upper limb reconstruction using soft.

Chapter 7 : Upper Extremity Deformities | RIAO

for injection is indicated for the treatment of upper limb spasticity in adult patients, to decrease the severity of increased muscle tone in elbow flexors (biceps), wrist flexors (flexor carpi radialis and flexor carpi ulnaris), finger flexors (flexor digitorum profundus and flexor digitorum sublimis), and thumb.

Chapter 8 : Hand and Upper Extremity | Children's Healthcare of Atlanta

Our team specializes in diagnosing and treating pediatric hand and upper extremity conditions, including overuse injuries and sprains as well as the following: Amputation Emergent and chronic amputation is the loss of a limb, hand or finger.

Chapter 9 : Amputation Levels - Hanger Clinic

MRI of the upper extremity anatomy - atlas of the human body using cross-sectional imaging We have created an

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anatomical atlas of the upper limb which is an interactive tool for studying the conventional anatomy of the shoulder, arm, forearm, wrist and hand based on an axial magnetic resonance of the entire upper limb.