Shriners Hospitals for Children®

Salt Lake City

Pediatric Specialty Care
Orthopaedics

Helping Kids Defy the Odds

New Patient Request Form

Pediatric Orthopaedic Referral Guidelines

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Acute Fracture (any site)	Clinical history: Patient usually presents with history of trauma and localized bony pain and or deformity. X-rays of the anatomic area of pain (two views) if pain can be localized. If skeletal fractures are visualized on x-ray then definitive care by PCP or referral. If x-rays are negative then: • Obtain labs: ESR, CRP, CBC, ± blood culture. • Consider bone scan if labs are abnormal and plain x-rays are not diagnostic.	All fractures that are beyond the comfort level of the treating physician should be referred for acute care. As a general rule, fractures with more than 15 - 20° of angulation are likely to require reduction or correction of their deformity. In particular, displaced forearm, femur and elbow fractures (including any with open wounds) may require urgent reduction or operative management. These patients should be referred directly to the nearest ER. Please feel free to contact our physician referral line for additional guidance during office hours.

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Back Pain **Diagnoses**: • Septic Diskitis • Vertebral Osteomyelitis • Spinal Tumors or Herniated Discs • Vertebral Fractures • Musculoskeletal Pain	Clinical history Physical Exam – localize vertebral level, neurologic deficit and other symptoms. Labs – rule out osteomyelitis CBC/CRP/ESR, consider HLA – B27. X-rays – AP and lateral spine of involved area (C, T, L, or S). MRI – only if pain is severe or persists more than one week or if there is a neurologic deficit. Bone scan if acute phase reactants are abnormal.	**Refer all children with severe back pain and a neurologic deficit to the nearest ER (urgently).** Refer patients to Shriners Hospitals for Children® if back pain evaluation shows abnormal labs or radiology. Consider a trial of NSAIDs and/or PT before referring a healthy child with chronic back pain if the labs and radiology are normal.

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Blount's Disease An uncommon dysplasia of the knee with the clinical appearance of "bowed legs." This must be differentiated from physiologic bowing because it requires treatment to improve. **Bowlegs** An exaggerated bending outward of the legs from the knees down that can be inherited. In many cases, it corrects itself as a child grows.	Clinical history – evaluate the patient for metabolic problems or other skeletal conditions. Physical exam – Assess the appearance of bowlegs in toddlers. Measure the distance between the knees in adolescence. X-rays – AP and lateral film of knee. Radiology is useful for diagnosing Blount's disease at age two or three.	Refer toddlers to Shriners Hospitals for Children® if bowing does not improve by age two. Physiologic bowing is typical in toddlers and usually peaks at 18 months then improves. Refer children or adolescents to Shriners Hospitals for Children® with abnormal appearance to the lower extremities. Refer adolescents with distance between knees over 7 cm to Shriners Hospitals for Children®.

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Bunions A bump that occurs at the base of the big toe when the joint that connects the toe to the foot becomes enlarged and sticks out. Bunions occur more often in children who are ligamentously lax or loose-jointed. The problem is more common in girls.	Clinical history – obvious and progressive prominence of 1st metatarsal head with associated site-specific pain. Physical exam – prominent 1st metatarsal head with deviation of great toe towards 2nd toe.	Refer to Shriners Hospitals for Children® when pain over 1st metatarsal head is not relieved by proper fitting footwear or when other interventions are ineffective.

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Clubfoot A deformity that is present at birth and can affect one or both feet. The foot is twisted so the toes point toward the opposite leg and the bottom of the foot faces inward. Without treatment a person may walk on their ankles or sides of their feet.	Clinical history Physical exam • Foot has a cavus (high arch) appearance • Forefoot has adductus or bending toward midline • Heel is inverted – tilted inward • Equinus – plantar flexed foot	Refer infants to Shriners Hospitals for Children® at diagnosis. Patients may also be referred and accepted as indicated through ultrasound if diagnosed while in the womb. Clubfoot may reoccur in children after treatment. Refer a patient to Shriners Hospitals for Children® if the foot looks bad, feels bad or works poorly.

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Compartment Syndrome Severe traumatic leg or arm pain that occurs when pressure within the muscles builds to dangerous levels. It is usually caused by a severe injury. Without treatment, it can lead to permanent muscle and nerve damage.	Clinical history – soft tissue or fracture pain in excess of what would be expected from the injury, tingling or burning sensations in the skin and the muscle may feel full or tight. Physical exam – recognize the most important clinical symptom: excessive pain. Labs – not helpful	Compartment syndrome referrals are extremely urgent and require emergent care. **Refer patient to the nearest ER when Compartment syndrome is being considered.** Timely diagnosis and treatment are extremely difficult. A diagnosis may be made by preoperative compartment pressure measurements or, in some cases, simply by clinical presentation.

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Extreme Pain **Limping** **Non Ambulation** **Diagnoses:** • Fracture • Sprain • Osteomyelitis • Inflammation • Possible "Septic Hip"	Clinical history Physical exam – localize the pain. X-rays of hips and knees Labs – CBC, CMP, C-reactive protein if infection is suspected.	Refer patients to Shriners Hospitals for Children® when: • Abnormal x-ray indicates a fracture requiring closed reduction or surgery. • Abnormal x-ray indicates a bone infection requiring surgery. • Abnormal labs indicate inflammation. Any child with **acute illness** and a limp should be referred directly to the nearest ER.

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Flatfeet The lack of an apparent arch in the foot when standing. Most flatfeet disappear by 2 – 3 years of age. • **Flexible Flatfoot** – The majority of children have this type of flatfoot. The condition is not painful, causes no disability and does not require treatment. • **Flexible Flatfoot With a Short Achilles Tendon** – Happens rarely in young children. It affects both feet and may cause pain and disability. • **Rigid Flatfoot** – is the least common type of Flatfoot. A child will not form an arch when asked to stand on their toes. It may affect one or both feet and can cause pain and disability.	Clinical history – flat plantar arch Physical exam – the arch of the foot is flattened and touches the ground when standing X-rays – not necessary unless ruling out another diagnosis	The vast majority of patients with flexible, painless flatfeet do not require orthopaedic treatment. Refer children with severe, painful flatfeet to Shriners Hospitals for Children® for evaluation. This is rare for children under age eight. Refer to Shriners Hospitals for Children® when unsure of the diagnosis.

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Hip Dysplasia Developmental Dysplasia/Dislocation of the Hip (DDH) – refers to a wide variety of problems in the formation of children's hips. In some cases, DDH means the child has shallow hip sockets that make dislocation more likely. Other children are born with hip bones that are already out of the socket.	Clinical history – family history, breech delivery, torticollis and associated feet and knee deformities. Physical exam – infant hip exam is difficult and may require pediatric orthopaedic expertise. Exam findings are very subtle. Hip "clunk" can be significant. Ultrasound of the hip if less than four to five months of age to rule out DDH, if suspected. X-rays – AP of pelvis for patients over four to five months of age.	Refer all infants with hip clunk or other abnormal hip findings to Shriners Hospitals for Children®. A patient with a family history of DDH, breech presentation and abnormal ultrasound or x-ray should be referred to Shriners Hospitals for Children®.

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Hip Pain (or knee pain referred from hip) **Diagnoses**: • Septic Hip (possible)	Clinical history – fever or signs of systemic illness. Physical exam – focus on range of motion of the hip, noting if there is stiffness or loss of motion. Labs – CBC, CRP, ESR if there is hip stiffness. X-rays – AP, frog lateral of hips/pelvis. Ultrasound of the hip is helpful to document an effusion. Total body scan if ultrasound is negative, labs are abnormal and hip is stiff on exam.	Refer any child experiencing hip pain for more than 48 hours or if labs/radiology are abnormal to Shriners Hospitals for Children®. If child is **acutely ill** refer immediately to the nearest ER. Hip pain in children that is persistent, alters activities or has positive findings on workup merits referral to Shriners Hospitals for Children®.

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In-toeing When a child's feet point inward as they walk. In-toeing develops from one of three areas: the foot, the knee or at the hip. • **Metatarsus Adductus** – an inward curve of the front half of the foot. 90% of children will outgrow the condition without treatment. • **Tibial Torsion** – The shin bone is slightly twisted or rotated causing the foot to turn in. The majority of tibial torsion corrects with growth by the age of five. • **Femoral Torsion** – Children are normally born with about 45 degrees of femoral anteversion. This inward twist of the femur gradually goes away with growth by about age 12.	Physical exam to determine level of deformity.	Refer patients to Shriners Hospitals for Children® when: • In-toeing is severe enough to warrant consideration of treatment (any age). • Functional problems with in-toeing after age ten. • Knee pain associated with in-toeing after age ten.

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Knee Pain **Diagnoses**: • Trauma – sprain/fracture • Tumor • Infection • Rheumatologic • Intraarticular – abnormal meniscus • Anterior knee pain	Clinical history – chronic pain lasting six or more weeks. Is the pain activity related? Swelling? Is patient ill or well? Physical exam – knee swelling? Is there patellar or peripateller pain? X-rays - AP and lateral knee Labs – consider CBC, ESR, CRP, ANA	For anterior knee pain or activity related knee pain – consider physical therapy or trial NSAIDs before referral. Chronic pain that is not activity related suggests a more subtle inflammatory oncoplastic or dysplasia diagnosis. Refer patients with positive findings on workup to Shriners Hospitals for Children®. Refer all patients with pain lasting six weeks or more after start of therapy to Shriners Hospitals for Children®. Sprains should improve in six weeks.

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Knee Sprain or Ligament Injury Sprain pain in children under the age of twelve is more likely to represent a physeal growth plate injury or occult fracture. "Sprain" as a diagnosis should be used **with caution**.	Clinical history – history of acute trauma then pain. Physical exam – knee effusion and pain. X-rays - AP and lateral knee True sprain or ligament injury should be splinted with partial weight bearing for four to six weeks with improvement or reassessment at two, four and six weeks. MRI is diagnostic for ligament injuries.	Refer all patients with MRI diagnosis and all adolescents with an acute injury and obvious knee effusion to Shriners Hospitals for Children®. If a patient has not improved within six weeks or if the diagnosis is uncertain refer to Shriners Hospitals for Children®.

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Leg Length Discrepancy	Clinical history Physical exam – Observable difference in length of legs. Referred pain in hips, knees or back.	Refer any patient with a leg length discrepancy of greater than 2 cm to Shriners Hospitals for Children®.

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Legg Perthes Disease **Legg Calve Perthes Disease** **Perthes Disease** A problem in the hip that occurs when blood temporarily stops flowing to the femoral head. Without blood, the bone collapses. As a result, the femoral head no longer moves smoothly in the hip socket.	Clinical history – a slight limp is often noted. Other symptoms include pain in the knee, thigh or groin, stiffness or limited range of motion in the hip and moderate pain with activity. Physical exam – loss of motion (internal rotation) X-rays – AP and frog lateral of pelvis	All patients with Perthes or consideration of Perthes disease should be referred to Shriners Hospitals for Children®.

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Locked Knee	Clinical history – usually a new symptom within 1 – 2 weeks. Physical exam – knee locked or episodic locking. Overwhelming likelihood is usually meniscal tear causing the "locking." X-rays MRI	Refer all patients to Shriners Hospitals for Children® with true "locked knee" for orthopaedic evaluation.

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Osteomyelitis A bone infection often caused by bacteria.	Clinical history Physical exam – local osseous tenderness Labs – CBC, ESR, CRP, WBC X-rays – AP and lateral films Total body scan – consider if labs are consistent with infection.	A child who is **acutely ill** should be sent directly to the nearest ER. All other cases with pain, abnormal labs or an abnormal bone scan should be referred to Shriners Hospitals for Children®.

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Skeletal Dysplasia	Clinical history Physical exam – include height, weight and a skeletal survey.	Refer a patient to Shriners Hospitals for Children® if the child is in the 5th percentile of height and weight for their age or if a skeletal survey shows abnormal results.

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Slipped Capital Femoral Epiphysis **Severe Hip Pain** **Physeal Fracture of Femoral Head**	Clinical history – hip pain or referred knee pain. Physical exam – severe pain or acute loss of internal hip rotation. X-rays – AP and frog pelvis.	Refer all children to Shriners Hospitals for Children® between the ages of 6 and 15 with persistent hip pain and painful ROM. Referrals of children with confirmed radiographic diagnosis should occur **immediately**. **Please note**: hip pathology often presents as knee pain in children. Obtain x-rays with presentation of pain and refer, even if diagnosis is uncertain.

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Spinal Abnormalities **Kyphosis** • Adolescent Kyphosis – most common form of kyphosis causing excessive roundness or a hump in the middle of the back. Adolescent kyphosis is often attributed to slouching. Postural kyphosis typically does not lead to problems in adult life. • Scheuermann's Kyphosis – patients usually have a more severe deformity. The vertebrae and disks in patients with Scheuermann's Kyphosis will appear irregular and wedge shaped in x-rays. • Congenital Kyphosis – young children or babies born with congenital kyphosis have a higher risk of developing spinal cord injuries. Surgical treatment may be needed at a young age to help maintain a normal spinal curve.	Clinical history – family history, age of onset is typically 10 -12 years of age. Patients often have pain in thoracic spine and poor posture. Physical exam – clinical deformity, stiffness and decreased range of motion. X-rays – AP/lateral of spine	Refer patients to Shriners Hospitals for Children® with more than 50 degrees kyphosis on lateral view of spine or any child with marked thoracic kyphosis (hunchback) and uncertain diagnosis.

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Spinal Abnormalities **Scoliosis** A sideways curvature of the spine that makes the spine look more like an "S" or "C." Scoliosis can cause the bones of the spine to rotate so that one shoulder, scapula, or hip appears higher than the other. • Adolescent Idiopathic Scoliosis – the most common type of scoliosis. It occurs after the age of ten. • Early Onset Scoliosis – occurs in children less than nine years old. • Infantile Scoliosis – occurs in children less than three years old.	Clinical history – Significance of other diseases associated with scoliosis or neurologic deficits. Physical exam – obtain angle of trunk rotation (Scoliometer reading) if possible. Also spine flexibility, tenderness and neurologic function. X-rays – upright AP/lateral thoracic-lumbar spine.	Refer patients to Shriners Hospitals for Children® with scoliosis of 20 degrees or greater or a Scoliometer reading of seven degrees or greater. Younger children may need a referral sooner.

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Spinal Abnormalities **Spondylolysis** A stress fracture of the spine that may cause lower back pain in adolescents. **Spondylolisthesis** A slipped vertebra occurs when one vertebra shifts forward on the vertebra directly below. It usually happens at the lumbosacral junction.	Clinical history – typically complains of pain at L5/S1. Possible history of overuse and hyperextension. Physical exam – may have local tenderness with back extension. Possible "step off" at L5/S1 region. X-rays – AP/lateral of lumbar spine Bone scan – can confirm diagnosis if the condition is not evident on x-rays.	Refer patients to Shriners Hospitals for Children® if the diagnosis is uncertain, the condition is painful or if the treatment is beyond the comfort level of the PCP.

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Toe Walking In most cases toe walking is caused by a short Achilles tendon which raises the heel and does not allow the patient to put it on the ground when walking. It can also be caused by much more serious conditions, such as neuromuscular disorders. The vast majority of patients require no treatment or a brief episode of casting.	Clinical history – determine onset and if additional problems exist. Physical exam – focus on tightness of calves verses hamstrings. Evaluate for static encephalopathy.	Refer children to Shriners Hospitals for Children® with persistent toe walking.

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Torticollis A twisted and tilted neck. • Temporary Torticollis – an ear infection or a cold can cause inflamed lymph nodes in a child. An injury to the head or neck can also cause the joints between the bones in the neck to swell and become sore. The condition will generally last one to two days. • Fixed Torticollis – may be caused by a problem with the bone or muscle structure, an abnormal area in the back part of the brain or by a tumor in the spinal cord. • Muscular Torticollis – happens when a child's neck muscles are especially tight or scarred on one side of the neck.	Clinical history – onset typically occurs at infancy. Physical exam – infantile soft tissue "mass" at sternocleidomastoid on the contracted side.	Refer infants to Shriners Hospitals for Children® if not showing improvement after 1-2 months or if a diagnosis of muscular torticollis is in question or if there is any loss of milestones or neurologic deficit. Refer adolescents to Shriners Hospitals for Children® if the symptoms have not improved in 2-3 days or if there is any neurologic deficit.

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