Seattle Children's
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Pediatric **Orthopedic** Consult and Referral Guidelines

Directory

Clinic phone: 206-987-2109. To request a consult or referral, please call the Clinical Intake Nurses at 206-987-2080 or toll free at 866-987-2080. You may fax a New Appointment Request Form to 206-985-3121 or toll free at 866-985-3121. To speak with a Seattle Children's physician for an urgent phone consultation, call the Physician Operator at 206-987-7777 or toll free at 877-985-4637.

Pediatric **Orthopedic** Consult and Referral Guidelines

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Extreme Pain or Limping or Non Ambulation	• Clinical history – no fever (?) • Physical exam – localizing the pain • X-rays Differential diagnoses include the following: • Fracture (any age) • Sprain – ligament injury (teenager) • Osteomyelitis – septic arthritis (any age) • Inflammation/Toxic Synovitis/Rheumatologic disease – (any age) Beware septic hip – especially in child age < 12 years with hip or non-specific leg pain or limp > 2 days See "possible septic hip"	Persistent pain or limp – 48 hours Abnormal x-ray consistent with fracture or infection Abnormal labs Abnormal bone scan Fracture or infection Any child with limp and appears acutely ill

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Acute Fracture at any anatomic site	• Clinical history: patient usually presents with discrete history of trauma and localized bony pain ± deformity
	• X-rays of the anatomic area of pain (2 views at least) – if pain can be localized
	• If skeletal fracture visualized on radiographs then definitive care by PCP or referral if x-rays negative then:
	  • Labs: ESR, CRP, CBC, ± blood culture
	  • Consider bone scan if labs abnormal and plain x-rays not diagnostic
		All fractures that are beyond comfort level of treating physician should be referred for acute care.
		The degree of acceptable angulation or step off varies by fracture site and patient age. As a general rule fractures with more than 15-20° of angulation are likely to require reduction or correction of their deformity. Forearm, femur and elbow fractures (especially supracondylar fractures) are the more common and challenging fractures.

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Hip Pain (or knee pain referred from hip) **"Possible Septic Hip"**	**Septic Hip** Workup suggested: • Clinical history: fever/signs of a systemic illness • Physical exam – focusing on range of motion of the hip (stiffness or loss of internal rotation) • Labs – CBC, CRP, ESR if there is hip stiffness • Radiography – AP/frog lateral of hips/pelvis • Hip ultrasound if hip is stiff or labs are abnormal • Total body bone scan if ultrasound is negative, labs are abnormal and hip is stiff on exam	Any child with "hip" pain > 48 hours or if child is acutely ill or if labs/radiology are abnormal.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Bone Infection or Osteomyelitis	• Clinic history – pain ≥ 48 hours – no history of trauma • Physical exam – local osseous tenderness • Labs – CBC↑ ESR↑ CRP↑ WBC • X-rays: A/P and lateral plain films • If labs consistent with infection consider total body scan	All cases with pain, abnormal labs, or abnormal bone scan. Total body bone scan is an excellent screening tool particularly in young children (< 10 years) who may represent a diagnostic challenge.

Diagnosis/symptom

"Compartment Syndrome" or Severe Traumatic Leg or Arm Pain

Note: RE: Compartment Syndrome Referrals are extremely urgent/emergent

Referring provider's initial evaluation and management can include:

- Clinical history – soft tissue or fracture pain in excess of usual pattern
- Physical exam: recognize the most important clinical symptom: pain in excess (of usual pattern)
- Labs – not helpful

When to initiate referral:

Refer when "Compartment Syndrome" is being considered! **This is a diagnosis requiring emergent care.**

Timely diagnosis and treatment are extremely difficult!

A definitive diagnosis is made by preoperative compartment pressure measurements.

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Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:

Soft Tissue Mass or Soft Tissue Sarcoma – Desmoid Lipoma, Hemangioma, Soft Tissue Abscess/ Hematoma	• Clinical history – mass presents
	• Physical exam – sarcomas are typical
	  • Larger than 5 cm
	  • Firm
	  • Deep
	  • Non-tender
	• Labs – can assist with soft tissues abscess diagnosis – CBC, CRP, ESR
	• Radiograph – MRI is definitive
		Refer all soft tissue masses that are beyond the diagnostic skill of referring physician.
		Refer any soft tissue mass that is larger than 3cm or enlarging clinically.
		Large, firm, non-tender soft tissue tumors are at risk for a soft tissue sarcoma.
		• MRI is not necessary before referral.

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Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Benign Bone Tumors NOF – Non-Ossifying Fibroma UBC – Benign cyst or unicameral bone cyst ABC – Aneurysmal bone cyst EG – Eosinophilic Granuloma **Malignant Bone Tumors** Osteosarcoma Ewings Sarcoma	• Clinical history – pain typically x 1's 6-12 weeks • Physical exam – local tenderness ± lump (exam does not distinguish benign from malignant) • Labs – helpful in excluding osteomyelitis: alkaline phosphatase elevated with sarcomas/ESR • Plain x-rays – diagnostic in most cases MRI/bone scan/ CT usually advisable in work-up	Refer all bone tumor for evaluation. Radiographic diagnoses are typically difficult. Osseous sarcomas are a challenging and timely diagnosis and typically occur in adolescents with persistent osseous pain; the most common location is in the distal femur and proximal tibia. All children with persistent musculoskeletal pain – lasting longer than 6 weeks should be evaluated with a plain x-ray of the involved anatomic site or a total body scan if pain continues without an obvious diagnosis.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:

Clubfoot	• Clinical history
	• Physical exam – includes:
	  • foot has a "cavus" (high arch) appearance
	  • "adductus" or bending the forefoot towards the midline
	  • "inverted" heel –tilted inwards and
	  • "equinus" – plantar flexed foot
	• Radiographs – not necessary
		New clubfoot < 1 year old – at diagnosis to see within 1-2 weeks.
		Clubfoot – in an older child, may reoccur after prior treatment – that looks bad, feels bad, works poorly.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Flatfeet	• Clinical history – flat plantar arch • Physical exam – the arch of the foot is flattened and touches the ground when standing • Radiographs – not necessary, unless specifically trying to rule out another diagnosis	The vast majority of patients with flexible flatfeet do not require orthopedic treatment. Only patients with severe, painful flatfeet need orthopedic evaluation. This is rare under age 8 years. Refer when unsure of diagnosis.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Bunions	• 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 • Radiographs – not necessary	Pain over 1st metatarsal head is not relieved by ensuring proper shoe-fitting, i.e. low heels, wide enough shoe at ball of foot (metatarsal heads).

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Toe Walking	• Clinical history – onset? other problems • Physical exam – focuses on the severity of tightness in calves vs. hamstrings • Radiographs – ***not*** recommended	Refer children with persistent toe walking ≥ 6-12 months. The vast majority of patients require no treatment or a brief episode of casting.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Metatarsus Adductus	• Physical exam – bending of the forefoot towards the midline	90% are flexible and do not need treatment. 10% are stiff and should be referred after age 6 months, to provide time for most to resolve. Other common causes of intoeing include internal tibial version and femoral anteversion. These rarely require treatment other than reassurance to parents.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Knee Sprain or Ligament Injury	• Clinical history: history of acute trauma then pain • Clinical exam – knee effusion and pain • X-ray – AP/lateral of the knee • True sprain or ligament injury should be splinted with partial weight bearing from 4-6 weeks with improvement or reassessment at 2, 4, and 6 weeks • Labs not helpful • MRI is diagnostic for ligament injuries	• "Sprain" pain in children < 12 years of age are more likely to represent a physeal growth plate injury or occult fracture and "sprain" as a diagnosis should be used with caution. • Refer if not improved at 6 weeks for re-evaluation. Also if diagnosis is uncertain referral is appropriate. • Refer all patients with MRI diagnosis and all adolescent athletes with an acute injury with obvious knee effusion. (MRI is not required prior to referral.) Such patients will have a ligament injury in 75% of cases.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
"Locked Knee"	• Clinical history – usually a new symptom within 1-2 weeks • Physical exam – knee locked or episodically locking. Overwhelming likelihood is usually meniscal tear causing the "locking" • MRI is diagnostic. Plain x-rays are also recommended.	All patients with true "locked knee" before or after MRI for orthopedic evaluation. • MRI is not necessary prior to referral.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Bowlegs (Possible Blount's Disease)	• Clinical history – evaluate patient for metabolic problems or other skeletal problem • Physical exam – assess leg for clinical appearance of bowlegs in toddlers. Measure TCD (distance between knees) in adolescence • X-rays – AP/lateral of the knee and diagnostic for Blount's Disease. X-rays are useful for this diagnosis at age 2.	Blount's Disease is an uncommon dysplasia of the knee with clinical appearance of "bowed" legs. This must be differentiated from physiologic bowing a variant of normal. Refer toddlers: with bowlegs not improving by age 2 years. (Physiologic bowing reaches its peak at 18 months then improves.) Refer adolescents with TCD over 7 cm.

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Knee Pain, Chronic	• Clinical history – chronic – pain ≥ 6 weeks. Is pain activity related? Swelling? Is patient ill or well?
	• Differential diagnosis includes:
	  • Trauma – "sprain/fracture"
	  • Tumor/infection/inflammation/rheumatologic
	  • Intraarticular – abnormal meniscus etc.
	  • Anterior knee pain
	• Exam: knee swelling? Is there patellar or peripateller pain? (patellar tendon, tibial tubercle, medial/lateral patella)
	• Radiographs – A/P and lateral knee
	• Consider labs: CBC, ESR, CRP, ANA
		• For anterior knee pain/activity related pain – consider PT or trial NSAIDs before referral.
		• Chronic pain that is not activity related suggests a more subtle inflammatory oncoplastic or dysplasia diagnosis
		• Refer all patients with pain ≥ 6 weeks after start of therapy. Sprains should improve in 6 weeks.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Developmental (congenital) Dislocation of the Hip (DDH) **Hip Dysplasia**	• Clinical history – high risk family history includes breech delivery in mother with/without DDH. Note: conditions associated with DDH are prior family history, breech presentation, torticollis and feet and knee deformities. • Physical exam – infant hip exam is difficult and requires pediatric orthopedic expertise. Hip "clunk" can be very significant, exam findings are very subtle. A hip "click" is not a sign of pathology. Hips and knees click in infants when soft tissues snap over young prominences. These are physiologic "clicks." • Plain x-rays – AP of pelvis and exam are diagnostic for a pediatric orthopedist in patients over 2-3 months of age. Ultrasonography also helpful in younger patients (age 6 months). • Breech presenting in utero or a positive family history of hip dysplasia are absolute indications for a radiograph (AP pelvis) around 3-4 months of age.	All infants with hip clunk. Patient with family history of DDH, breech presentation and abnormal ultrasound or x-ray should be referred.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Slipped Capital Femoral Epiphysis (SCFE) Severe Hip Pain Physeal Fracture of Femoral Head	• Clinical history – hip pain or referred knee pain in well adolescent • Physical exam – severe pain/acute loss of hip internal rotation • Plain x-rays – demonstrate either obvious physeal fracture of femoral head or chronic very subtle "slip" – difficult to determine slip, requiring orthopedic evaluation. SCFE occurs bilaterally in 20% of cases and is associated with hyperthyroidosis, renal disease and other systemic conditions such as para hypopituitarism.	Refer all children between ages 6 and 12 years with persistent hip pain and painful passive ROM (esp internal rotation) as an ***urgent*** referral because of the need to avoid severely displaced fracture/dislocations of the hip. Referral of children with a radiographic diagnosis should occur within 24 hours. Treatment is ***urgent*** operative fixation. Patients should be on strict non-weight bearing!

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Legg Perthes Disease or Legg Calve Perthes or Perthes Disease	• Clinical history – Perthes is an idiopathic avascular necrosis of one or both (bilateral) hips, typically ages 4-10 years old. Pain free limp or moderate pain with activity is often seen. • Physical exam – loss of motion (internal rotation) is an important finding • Radiographics – plain x-rays are typically diagnostic. AP and frog pelvis.	All patients with Perthes or consideration of Perthes disease should be evaluated by an orthopedist. Plain x-rays are recommended prior to the referral.

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Scoliosis or Spinal Curvation	• Clinical history – significant 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 • Radiographs – appropriate x-rays – upright AP/lateral thoracic-lumbar spine preferably on 36" cassettes	Refer all children with a scoliosis ≥ 20⁰ (x-ray) or Scoliometer > 7.⁰ As a general rule patients receive bracing treatment for significant progression in young patients with slow curves (20-40⁰) and surgical treatment for curves ≥ 50.⁰ X-ray not necessary before referral but is recommended.

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Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Back Pain **Other Diagnoses:** Septic Discitis Vertebral Osteomyelitis Spinal Tumors or Herniated Discs Vertebral Fractures Musculoskeletal Pain	• Clinical history – Septic discitis vs. other diagnosis • Physical exam – to localize vertebral level, neurologic deficit, other symptoms • Labs – to rule out osteomyelitis CBC/CRP/ESR, consider HLA-B27 • Plain x-rays – A/P and lateral spine of involved area (C, T, L, or S) • MRI – only if pain severe or persists >1 week or there is a neurologic deficit or bone scan if acute phase reactants are abnormal. (Referral can be made prior to MRI being obtained.)	• Refer all children with severe back pain with neurologic deficit ***(urgently).*** • Refer if back pain eval shows abnormal labs or radiology. • If chronic back pain in healthy child with normal labs, normal radiology, consider trial of NSAIDs and/or PT before referral.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Spondylolysis and Spondylolisthesis (stress fracture of lower back)	• Clinical history –usually c/o back pain at L5/S1. Possible history of overuse/hyperextension • Physical exam – may have local tenderness with back extension possible "stepoff" at L5/S1 region • Radiographs – AP/lateral of L-spine • Bone scan can confirm diagnosis if plain x-ray is equivocal	• Spondylolysis/Sponsylolisthesis disgnosis is confirmed but treatment is beyond comfort level of PCP. • Refer also if diagnosis is uncertain.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Scheuermann's Kyphosis	• Clinical history – typically a familial disorder. Age of onset is 10-12 years of age. Patients often present with thoracic back and "poor posture" apical kyphosis at thoracic spine • Physical exam – clinical deformity and stiffness/range of motion. Scheuermann's Kyphosis is defined as an adolescent kyphosis > 50° • Radiographs – thoracic spine – AP/lateral	• Refer any child with more than 50° kyphosis on lateral view of spine. • Refer any child with marked thoracic kyphosis (hunch-back) and uncertain diagnosis.

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Skeletal Dysplasia	• Clinical history • Physical exam – including height and weight and a skeletal survey	Height/weight, 5th percentile for age, or abnormal results on skeletal survey

Diagnosis/symptom	Referring provider's initial evaluation and management can include:	When to initiate referral:
Torticollis	• Clinical history – onset typically at infancy or "muscular" torticollis. 90% of infantile torticollis resolves spontaneously* • Physical exam – infantile soft tissue "mass" at sternocleidomastoid on the contracted side • Radiographs – often not helpful in infants * Acute adolescent torticollis ("wry neck") may occur after URI. X-rays should be carried out on C-spine. Usually resolves in 1-2 days with rest, support, NSAIDs.	Infants: if not showing improvement after 1-2 months; if diagnosis of muscular torticollis is in question; if any loss of milestones or neurologic deficit. Adolescents: if not improved in 2-3 days or any neurolic deficit.

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