

# The Pediatric Orthopaedic Surgery Milestone Project

*A Joint Initiative of*

The Accreditation Council for Graduate Medical Education

and

The American Board of Orthopaedic Surgery



July 2015

# The Pediatric Orthopaedic Surgery Milestone Project

The Milestones are designed only for use in evaluation of fellows in the context of their participation in ACGME-accredited residency or fellowship programs. The Milestones provide a framework for the assessment of the development of the fellow in key dimensions of the elements of physician competency in a specialty or subspecialty. They neither represent the entirety of the dimensions of the six domains of physician competency, nor are they designed to be relevant in any other context.

## Pediatric Orthopaedic Surgery Milestones

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## Milestone Reporting

This document presents milestones designed for programs to use in semi-annual review of fellow performance and reporting to the ACGME. Milestones are knowledge, skills, attitudes, and other attributes for each of the ACGME competencies organized in a developmental framework from less to more advanced. They are descriptors and targets for fellow performance as a fellow moves from entry into fellowship through graduation. In the initial years of implementation, the Review Committee will examine Milestone performance data for each program's fellows as one element in the Next Accreditation System (NAS) to determine whether fellows overall are progressing.

For each period, review and reporting will involve selecting Milestone levels that best describe each fellow's current performance and attributes. Milestones are arranged into numbered levels. Tracking from Level 1 to Level 5 is synonymous with moving from novice to expert in the subspecialty. These levels do not correspond with post-graduate year of education.

Selection of a level implies that the fellow substantially demonstrates the milestones in that level, as well as those in lower levels (see the diagram on page v).

**Level 1:** The fellow demonstrates milestones expected of an incoming fellow.

**Level 2:** The fellow is advancing and demonstrates additional milestones, but is not yet performing at a mid-fellowship level.

**Level 3:** The fellow continues to advance and demonstrate additional milestones, consistently including the majority of milestones targeted for fellowship.

**Level 4:** The fellow has advanced so that he or she now substantially demonstrates the milestones targeted for fellowship. This level is designed as the graduation target.

**Level 5:** The fellow has advanced beyond performance targets set for fellowship and is demonstrating "aspirational" goals which might describe the performance of someone who has been in practice for several years. It is expected that only a few exceptional fellows will reach this level.

## **Additional Notes**

Level 4 is designed as the graduation *target* but *does not* represent a graduation *requirement*. Making decisions about readiness for graduation is the purview of the fellowship program director. Study of Milestone performance data will be required before the ACGME and its partners will be able to determine whether milestones in the first four levels appropriately represent the developmental framework, and whether Milestone data are of sufficient quality to be used for high-stakes decisions.

Examples are provided with some milestones. Please note that the examples are not the required element or outcome; they are provided as a way to share the intent of the element.

Some milestone descriptions include statements about performing independently. These activities must occur in conformity to ACGME supervision guidelines, as well as to institutional and program policies. For example, a fellow who performs a procedure independently must, at a minimum, be supervised through oversight.

*Answers to Frequently Asked Questions about Milestones are available on the Milestones web page:*

<http://www.acgme.org/acgmeweb/Portals/0/MilestonesFAQ.pdf>.

The diagram below presents an example set of milestones for one sub-competency in the same format as the ACGME Report Worksheet. For each reporting period, a fellow's performance on the milestones for each sub-competency will be indicated by selecting the level of milestones that best describes that fellow's performance in relation to the milestones.

Pediatric Orthopaedics Lower Extremity Deformity — Patient Care				
Level1	Level2	Level3	Level4	Level5
<ul style="list-style-type: none"> <li>• Performs history and physical examination</li> <li>• Measures radiographic mechanical axis and angular alignment</li> <li>• Measures clinical alignment and rotational profile</li> </ul>	<ul style="list-style-type: none"> <li>• Orders correct radiographic examinations for genu varum/valgum</li> <li>• Orders correct studies to evaluate a post-traumatic growth arrest</li> <li>• Calculates remaining growth</li> <li>• Identifies radiographic location of deformity, center of rotation of angulation (CORA) – location of osteotomy and effect on mechanical axis</li> </ul>	<ul style="list-style-type: none"> <li>• Performs hemiepiphysiodesis and epiphysiodesis, temporary and permanent</li> <li>• Prepares pre-operative plan of simple limb deformity correction</li> <li>• Writes physical therapy prescription following limb deformity surgery</li> <li>• Recognizes complications of limb deformity surgery</li> <li>• Demonstrates ability to evaluate imaging studies for growth potential - classification of Blounts disease ; size of physeal bar- implications for treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Performs limb osteotomy and demonstrates ability to apply fixation (internal or external)</li> <li>• Manages post-surgical complications</li> <li>• Performs bar resection and interposition</li> </ul>	<ul style="list-style-type: none"> <li>• Performs multi-level and multi-planar limb deformity surgery to include lengthening</li> <li>• Salvages severe complications of lengthening /deformity correction</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Selecting a response box in the middle of a level implies that milestones in that level and in lower levels have been substantially demonstrated.

Selecting a response box on the line in between levels indicates that milestones in lower levels have been substantially demonstrated as well as **some** milestones in the higher level(s).

Pediatric Orthopaedics Idiopathic Scoliosis — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Performs basic scoliosis examination (e.g., trunk position, skin, neuro)</li> <li>• Measures Cobb angles</li> <li>• Assesses skeletal maturity</li> <li>• Demonstrates use of basic spinal instruments</li> <li>• Closes spine wound</li> </ul>	<ul style="list-style-type: none"> <li>• Performs abdominal reflex test</li> <li>• Uses scoliometer accurately or prominence quantification</li> <li>• Identifies congenital scoliosis on radiographs</li> <li>• Safely positions patient on operating room [OR] table</li> <li>• Exposes and dissects posterior spine</li> </ul>	<ul style="list-style-type: none"> <li>• Performs plumb line test</li> <li>• Analyzes sagittal spinal balance/deformity</li> <li>• Interprets bending and/or stretch films</li> <li>• Evaluates brace efficacy - clinical/radiographic</li> <li>• Inserts spinal implants</li> <li>• Interprets normal neuromonitoring</li> <li>• Interprets intra-operative imaging</li> <li>• Provides post-operative management</li> </ul>	<ul style="list-style-type: none"> <li>• Recognizes physical findings that may predict complications (e.g., acne, obesity, lordosis)</li> <li>• Evaluates post-operative films (immediate and follow-up)</li> <li>• Completes case (e.g., instrumentation, deformity correction, bone grafting, closure) with staff as scrubbed assistant</li> <li>• Interprets and acts on abnormal neuromonitoring</li> </ul>	<ul style="list-style-type: none"> <li>• Works in complex referral center for spinal deformity</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric developmental dysplasia of hip [DDH] prior to walking age — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Performs appropriate hip examination to include Ortolani and Barlow</li> <li>• Identifies physical signs of DDH in older infant</li> </ul>	<ul style="list-style-type: none"> <li>• Applies and monitors Pavlik harness</li> <li>• Interprets radiographs (age appropriate)</li> <li>• Identifies physical signs of bilateral DDH</li> </ul>	<ul style="list-style-type: none"> <li>• Interprets ultrasound imaging</li> <li>• Identifies an adequate ultrasound examination</li> <li>• Identifies failure of Pavlik treatment</li> <li>• Formulates plan of care for failed Pavlik harness treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Performs and interprets arthrogram</li> <li>• Performs adductor tenotomy, closed reduction, and spica cast application</li> <li>• Performs open reduction approach and spica cast application</li> <li>• Manages failed closed or open reduction</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates skill in management of multiple failed DDH treatments</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				



Pediatric orthopaedics slipped capital femoral epiphysis [SCFE] — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Performs history and physical exam</li> <li>• Orders and interprets appropriate radiographs</li> <li>• Performs in-situ pinning of stable SCFE</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluates and interprets intra-operative images</li> <li>• Provides post-operative management of stable vs. unstable SCFE</li> </ul>	<ul style="list-style-type: none"> <li>• Performs hip arthrotomy/capsulotomy</li> <li>• Interprets magnetic resonance imaging [MRI] for pre-slip</li> <li>• Performs surgical pinning of severe/unstable SCFE</li> <li>• Evaluates painful hip following pinning (e.g., pin penetration, chondrolysis, osteonecrosis)</li> </ul>	<ul style="list-style-type: none"> <li>• Performs proximal femoral osteotomy, and manages patient post-operatively</li> <li>• Performs open head-neck contouring via anterior approach</li> </ul>	<ul style="list-style-type: none"> <li>• Performs reduction of SCFE via surgical hip dislocation approach</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric Orthopaedic Clubfoot — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Applies, molds, and safely removes casting material</li> <li>• Provides surgical management of contracted musculotendinous unit</li> </ul>	<ul style="list-style-type: none"> <li>• Applies and molds clubfoot cast</li> <li>• Performs physical examination and assessment of clubfoot deformity</li> </ul>	<ul style="list-style-type: none"> <li>• Applies all in series of sequential clubfoot casts, from initial to final</li> <li>• Performs tendo Achilles tenotomy</li> <li>• Performs open tendo Achilles lengthening</li> <li>• Applies and monitors clubfoot bracing post-casting</li> </ul>	<ul style="list-style-type: none"> <li>• Performs casting for complex clubfoot</li> <li>• Performs casting for relapse</li> <li>• Performs tibialis anterior transfer</li> <li>• Performs posteromedial and lateral release [PMLR]/certified specialist in trauma registry [CSTR], comprehensive clubfoot repair/osteotomies</li> </ul>	<ul style="list-style-type: none"> <li>• Performs salvage procedures for complex, recurrent clubfoot</li> <li>• Performs combination procedures</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric Orthopaedics Lower Extremity Deformity — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Performs history and physical examination</li> <li>• Measures radiographic mechanical axis and angular alignment</li> <li>• Measures clinical alignment and rotational profile</li> </ul>	<ul style="list-style-type: none"> <li>• Orders correct radiographic examinations for genu varum/valgum</li> <li>• Orders correct studies to evaluate a post-traumatic growth arrest</li> <li>• Calculates remaining growth</li> <li>• Identifies radiographic location of deformity, center of rotation of angulation (CORA) – location of osteotomy and effect on mechanical axis</li> </ul>	<ul style="list-style-type: none"> <li>• Performs hemiepiphysiodesis and epiphysiodesis, temporary and permanent</li> <li>• Prepares pre-operative plan of simple limb deformity correction</li> <li>• Writes physical therapy prescription following limb deformity surgery</li> <li>• Recognizes complications of limb deformity surgery</li> <li>• Demonstrates ability to evaluate imaging studies for growth potential - classification of Blounts disease; size of physeal bar- implications for treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Performs limb osteotomy and demonstrates ability to apply fixation (internal or external)</li> <li>• Manages post-surgical complications</li> <li>• Performs bar resection and interposition</li> </ul>	<ul style="list-style-type: none"> <li>• Performs multi-level and multi-planar limb deformity surgery to include lengthening</li> <li>• Salvages severe complications of lengthening/deformity correction</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric Orthopaedics Cerebral Palsy — Patient Care				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Obtains pertinent history, including developmental milestones</li> <li>• Performs physical exam of lower extremity</li> <li>• Performs age-appropriate neurologic examination</li> </ul>	<ul style="list-style-type: none"> <li>• Obtains focused history and physical exam, including hip (e.g., able to identify hip subluxation, lower extremity contractures/spasticity, spinal deformity)</li> <li>• Interprets radiographic findings of hip subluxation</li> <li>• Understands when to obtain appropriate neurology and developmental pediatrics consults</li> </ul>	<ul style="list-style-type: none"> <li>• Identifies gait pattern (e.g., crouch, jump, di/hemiplegia)</li> <li>• Differentiates between spasticity and tone from contractures</li> <li>• Prescribes lower extremity orthotics as indicated</li> </ul>	<ul style="list-style-type: none"> <li>• Performs hip subluxation surgery to include muscle release and femoral and pelvic osteotomies</li> <li>• Performs single-event, multi-level surgery, including osteotomy, tendon lengthenings , and transfer</li> <li>• Manages complications of surgery</li> <li>• Manages post-operative recovery and rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>• Performs revision surgery for complications (redislocation)</li> <li>• Performs surgery for symptomatic non-reconstructible hip</li> <li>• Performs revision surgery for the adolescent with severe contractures</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric Orthopaedics Idiopathic Scoliosis — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Identifies signs and symptoms of idiopathic and non-idiopathic scoliosis</li> <li>• Describes curve types and natural history of each curve</li> <li>• Describes radiographic signs of skeletal maturity</li> <li>• Describes treatment options of non-operative vs. operative scoliosis</li> <li>• Describes catastrophic risks of surgical correction</li> </ul>	<ul style="list-style-type: none"> <li>• Describes radiographic signs of adolescent idiopathic scoliosis [AIS] vs. non-AIS</li> <li>• Applies classification of curve type with awareness of both Lenke and King-Moe</li> <li>• Understands the correlation of peak height velocity [PHV] and risk for scoli progression</li> <li>• Describes indications for bracing</li> <li>• Knows different brace types for different patterns</li> <li>• Describes surgical indications</li> <li>• Describes major risks for surgery (e.g., infection, re-operation, and implant failure)</li> </ul>	<ul style="list-style-type: none"> <li>• Describes indications for MRI and referral to neurology or genetics</li> <li>• Understands implications of classification system</li> <li>• Describes bone ages and correlation with peak height/growth velocity (PHGV) analyzes brace efficacy (literature)</li> <li>• Creates surgical plan by curve type</li> <li>• Describes risks of patient dissatisfaction (e.g., scar, trunk imbalance, pain, cosmesis)</li> </ul>	<ul style="list-style-type: none"> <li>• Understands genetic research in etiology and prognosis</li> <li>• Counsels families who choose non-brace or bracing options</li> <li>• Describes level selection, type of instrumentation, deformity correction techniques, and surgical approaches</li> <li>• Describes management of catastrophic complications</li> </ul>	<ul style="list-style-type: none"> <li>• Performs primary research and published findings in a peer-reviewed journal</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric Orthopaedics DDH prior to walking age — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Understands role of screening for DDH</li> <li>• Understands normal hip anatomy</li> <li>• Understands risk factors for DDH</li> <li>• Demonstrates knowledge of associated conditions</li> <li>• Understands natural history of untreated DDH</li> </ul>	<ul style="list-style-type: none"> <li>• Differentiates developmental from teratologic hip dysplasia</li> <li>• Understands use and risks of Pavlik harness treatment</li> <li>• Understands choice of imaging studies by age of child</li> <li>• Demonstrates knowledge of vascular anatomy of the developing hip</li> </ul>	<ul style="list-style-type: none"> <li>• Understands ultrasound anatomy and implications</li> <li>• Understands physical exam and imaging signs of Pavlik treatment failure</li> <li>• Understands indications for closed versus open reduction</li> <li>• Understands anatomic blocks to reduction</li> </ul>	<ul style="list-style-type: none"> <li>• Understands anatomy of surgical approaches - medial and anterior</li> <li>• Understands classification and implications of avascular necrosis of hip</li> </ul>	<ul style="list-style-type: none"> <li>• Performs primary research on infantile DDH, and publishes findings in a peer-reviewed journal</li> <li>• Is an invited expert/nationally-recognized expert</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric Orthopaedics SCFE — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Demonstrates knowledge of SCFE pathoanatomy and terminology</li> <li>• Demonstrates knowledge of risk factors</li> <li>• Demonstrates knowledge of clinical signs and symptoms</li> <li>• Demonstrates knowledge of basic radiographic findings (subtle, severe)</li> <li>• Demonstrates knowledge of treatment concepts - stable vs. unstable</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates detailed knowledge of epiphyseal blood supply</li> <li>• Understands natural history of SCFE in-situ pinning</li> <li>• Understands the controversy in treatment of severe/unstable SCFE</li> <li>• Understands details of correct screw placement</li> <li>• Understands decision making for prophylactic pinning of contralateral hip</li> </ul>	<ul style="list-style-type: none"> <li>• Understands complications of surgical treatment</li> <li>• Understands evaluation of at-risk or pre-slip patient</li> <li>• Understands natural history of gait disturbance and bone impingement after SCFE</li> </ul>	<ul style="list-style-type: none"> <li>• Understands surgical options for late reconstructive surgery</li> <li>• Understands indications for proximal femoral osteotomy</li> <li>• Understands methods and risks for acute reduction of SCFE</li> </ul>	<ul style="list-style-type: none"> <li>• Performs primary research, and publishes findings in a peer-reviewed journal</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Pediatric Ortho Clubfoot — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Demonstrates knowledge of tarsal bone and joint anatomy</li> <li>• Demonstrates knowledge of muscles and tendons of foot</li> <li>• Demonstrates knowledge of foot biomechanics in normal gait</li> <li>• Demonstrates knowledge of innervation/neuroanatomy of leg and foot</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of components of clubfoot deformity cavus, forefoot adduction, heel varus, and equinus (CAVE)</li> <li>• Demonstrates knowledge of different types and classifications of clubfoot</li> <li>• Demonstrates knowledge of pathologic anatomy of clubfoot</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of the Ponseti principles of clubfoot casting</li> <li>• Demonstrates knowledge of the indications for tendo Achilles tenotomy</li> <li>• Demonstrates knowledge of post-casting bracing protocol</li> <li>• Understands demographics, risk factors, associated conditions, and hereditary patterns</li> <li>• Demonstrates knowledge of pathologic gait deviations in clubfoot</li> </ul>	<ul style="list-style-type: none"> <li>• Understands indications for relapse casting, tibialis anterior tendon/tendon Achilles lengthening, tendon transfer, joint releases, osteotomies</li> <li>• Recognizes complex clubfoot</li> <li>• Demonstrates knowledge of segmental analysis of relapse/recurrent deformity</li> <li>• Demonstrates knowledge of different surgical approaches for clubfoot – a la carte, posteromedial and lateral releases, complete subtalar release, tibiotalar release</li> <li>• Demonstrates knowledge treatment options for syndromic clubfoot</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of genetics of clubfoot</li> <li>• Compares and contrasts theories of pathogenesis</li> <li>• Understands tarsal and lower extremity [LE] kinematics</li> <li>• Manages neglected, older clubfoot</li> <li>• Manages multiply operated clubfoot</li> <li>• Performs primary research, and publishes findings in a peer-reviewed journal</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				



Pediatric Orthopaedics Lower Extremity Deformity — Medical Knowledge				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Demonstrates knowledge of mechanical and anatomic axes of lower extremities (age-based)</li> <li>• Understands physeal growth</li> <li>• Understands post-traumatic remodeling</li> <li>• Understands the natural history of rotational profile (e.g., tibial torsion/femoral anteversion)</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of conditions producing pathologic angular deformity (e.g., Blount’s, rickets)</li> <li>• Demonstrates knowledge of angular deformity resulting from post-traumatic growth disturbance</li> <li>• Demonstrates knowledge of measures of remaining skeletal growth</li> <li>• Demonstrates knowledge of consequences of limb length differences</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of growth modulation techniques (e.g., indications, surgical techniques, and complications)</li> <li>• Demonstrates knowledge of rehabilitation needs and potential problems during deformity correction</li> <li>• Demonstrates knowledge of classification of Blount’s disease and prognosis</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of surgical options to include osteotomies (acute vs. gradual) with internal vs. external fixation</li> <li>• Demonstrates knowledge of lower extremity deformity in skeletal dysplasias</li> <li>• Demonstrates knowledge of treatment options for post-traumatic growth arrest</li> </ul>	<ul style="list-style-type: none"> <li>• Performs primary research, and publishes findings in a peer-reviewed journal</li> <li>• Demonstrates knowledge and understands basic science research in physeal physiology</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

**Pediatric Orthopaedics Cerebral Palsy [CP] — Medical Knowledge**

Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Understands the pathophysiology of CP</li> <li>• Differentiates between spastic quad, hemi, and diplegia</li> </ul>	<ul style="list-style-type: none"> <li>• Understands gross motor function classification system [GMFCS] of CP child</li> <li>• Differentiates between spastic/athetoid/mixed CP</li> <li>• Understands the musculoskeletal implications of differing GMFCS levels of neurological involvement</li> <li>• Demonstrates knowledge of the indications for imaging studies</li> <li>• Evaluates medical co-morbidities and anesthetic/post-operative risks</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates understanding of hip/spine surveillance</li> <li>• Demonstrates understanding of non-surgical tone management and contracture</li> <li>• Demonstrates knowledge and ability to analyze gait and contractures via physical exam and observation</li> <li>• Explains the consequences of inappropriate surgery</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates knowledge of surgical options for hip subluxation, ambulatory contractures</li> <li>• Develops surgical plan for multi-level surgery in ambulatory patients</li> <li>• Demonstrates knowledge of accepted and alternative treatment methods for CP</li> <li>• Demonstrates knowledge of indications and methods of CP spinal deformity correction</li> </ul>	<ul style="list-style-type: none"> <li>• Performs primary research, and publishes findings in a peer-reviewed journal</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Comments:**

Systems thinking, including cost-effective practice — Systems-based Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Describes basic levels of systems of care (e.g., self-management to societal)</li> <li>• Understands the economic challenges of patient care in the health care system</li> </ul>	<ul style="list-style-type: none"> <li>• Gives examples of cost and value implications of care he or she provides (e.g., gives examples of alternate sites of care resulting in different costs for individual patients)</li> </ul>	<ul style="list-style-type: none"> <li>• Orders and schedules tests in appropriate systems for individual patients balancing expenses and quality</li> <li>• Manages transfers of patient care from OR to inpatient environment or to home</li> </ul>	<ul style="list-style-type: none"> <li>• Effectively manages clinic team and schedules for patient and workflow efficiency</li> <li>• Uses evidence-based guidelines for cost-effective care</li> </ul>	<ul style="list-style-type: none"> <li>• Leads systems change at micro and macro levels (e.g., OR team and patient flow in a multi-case OR day)</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Resident will work in interprofessional teams to enhance patient safety and quality care — Systems-based Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Recognizes importance of complete and timely documentation in teamwork and patient safety</li> </ul>	<ul style="list-style-type: none"> <li>• Uses checklists and briefings to prevent adverse events in health care</li> </ul>	<ul style="list-style-type: none"> <li>• Participates in quality improvement or patient safety program and/or project</li> </ul>	<ul style="list-style-type: none"> <li>• Maintains team situational awareness and promotes “speaking up” with concerns</li> <li>• Incorporates clinical quality improvement and patient safety into clinical practice</li> </ul>	<ul style="list-style-type: none"> <li>• Develops and publishes quality improvement project results</li> <li>• Leads local or regional quality improvement project</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Uses technology to accomplish safe health care delivery – Systems-based Practice				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>Explains the role of the electronic health record [EHR] and computerized physician order entry (CPOE) in potential medical errors</li> </ul>	<ul style="list-style-type: none"> <li>Appropriately and accurately enters patient data in EHR</li> <li>Effectively uses electronic medical records in patient care</li> </ul>	<ul style="list-style-type: none"> <li>Reconciles conflicting data in the medical record</li> </ul>	<ul style="list-style-type: none"> <li>Contributes to reduction of risks of automation and computerized systems by reporting system problems</li> </ul>	<ul style="list-style-type: none"> <li>Recommends systems re-design for faculty computerized processes</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

**Self-Directed Learning — Practice-based Learning and Improvement**

- 1. Identifies strengths, deficiencies, and limits in one’s knowledge and expertise.**
- 2. Assesses patient outcomes and complications in your own practice.**
- 3. Sets learning and improvement goals.**
- 4. Identifies and Performs appropriate learning activities.**
- 5. Uses information technology to optimize learning and improve patient outcomes.**

Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Acknowledges gaps in personal knowledge and expertise, and frequently asks for feedback from teachers and colleagues</li> <li>• Demonstrates computer literacy and basic computer skills in clinical practice</li> </ul>	<ul style="list-style-type: none"> <li>• Continually assesses performance by evaluating feedback and assessments</li> <li>• Develops a learning plan based on feedback with some external assistance</li> <li>• Demonstrates use of published review articles or guidelines to review common topics in practice</li> <li>• Uses patient care experiences to direct learning</li> </ul>	<ul style="list-style-type: none"> <li>• Accurately assesses areas of competence and deficiencies and modifies learning plan</li> <li>• Demonstrates the ability to select an appropriate evidence-based information tool to answer specific questions while providing care</li> <li>• Reads classic articles and texts in pediatric orthopaedic surgery</li> </ul>	<ul style="list-style-type: none"> <li>• Performs self-directed learning without external guidance</li> <li>• Critically evaluates and uses patient outcomes to improve patient care</li> <li>• Demonstrates knowledge about classic articles and texts</li> <li>• Reads current literature</li> <li>• Incorporates practice change based upon new evidence</li> </ul>	<ul style="list-style-type: none"> <li>• Teaches and mentors colleagues on incorporating practice change based on new evidence</li> </ul>

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**Comments:**

Locates, appraises, and assimilates evidence from scientific studies to improve patient care — Practice-based Learning and Improvement				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Describes basic concepts in clinical epidemiology, biostatistics, and clinical reasoning</li> <li>• Categorizes the study design of a research study</li> </ul>	<ul style="list-style-type: none"> <li>• Ranks study designs by their level of evidence</li> <li>• Identifies bias affecting study validity</li> <li>• Formulates a searchable question from a clinical question</li> </ul>	<ul style="list-style-type: none"> <li>• Applies a set of critical appraisal criteria to different types of research, including synopses of original research findings, systematic reviews and meta-analyses, and clinical practice guidelines</li> <li>• Critically evaluates information from others, including from colleagues, experts, and patients</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates a clinical practice that incorporates principles and basic practices of evidence-based practice and information mastery</li> <li>• Cites evidence supporting several common practices</li> <li>• Is scientifically skeptical of new therapeutic options and surgical procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Independently teaches and assesses evidence-based medicine and information mastery techniques</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Demonstrates **compassion, integrity, and respect for others, as well as sensitivity and responsiveness to diverse patient populations, including to diversity in gender, age, culture, race, religion, disabilities, and sexual orientation. Demonstrates knowledge about, respect for, and adherence to the ethical principles relevant to the practice of medicine, remembering in particular that responsiveness to patients that supersedes self-interest is an essential aspect of medical practice — Professionalism**

Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Consistently demonstrates behavior that conveys caring, honesty, and genuine interest in patients and families</li> <li>• Recognizes the diversity of patient populations with respect to gender, age, culture, race, religion, disabilities, sexual orientation, and socioeconomic status</li> <li>• Recognizes the importance and priority of patient care, with an emphasis on the care that the patient wants and needs; demonstrates a commitment to this value</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates and understands the importance of compassion, integrity, respect, sensitivity, and responsiveness while exhibiting these attitudes consistently in common and uncomplicated situations</li> <li>• Consistently recognizes ethical issues in practice; discusses, analyzes, and manages these in common and frequent clinical situations, including socioeconomic variances in patient care</li> </ul>	<ul style="list-style-type: none"> <li>• Exhibits these attitudes consistently in complex and complicated situations</li> <li>• Recognizes how own personal beliefs and values impact medical care</li> <li>• Is knowledgeable about the beliefs, values, and practices of diverse patient populations and their potential impact on patient care</li> <li>• Recognizes ethical violations in professional and patient aspects of medical practice</li> </ul>	<ul style="list-style-type: none"> <li>• Develops and uses an integrated and coherent approach to understanding and effectively working with others to provide good medical care that integrates personal standards with standards of medicine</li> <li>• Consistently considers and manages ethical issues in practice</li> <li>• Consistently practices medicine as related to specialty care in a manner that upholds values and beliefs of self and medicine</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrates leadership and mentoring regarding these principles of bioethics</li> <li>• Manages ethical misconduct in patient management and practice</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Demonstrates <b>accountability to patients, society, and the profession; demonstrates personal responsibility to maintain emotional, physical, and mental health — Professionalism</b>				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>• Understands when assistance is needed, and is willing to ask for help</li> <li>• Exhibits basic professional responsibilities, such as timely reporting for duty, being rested and ready to work, displaying appropriate attire and grooming, and delivering patient care as a functional physician</li> <li>• Is aware of the basic principles and aspects of the general maintenance of emotional, physical, and mental health, and issues related to fatigue/sleep deprivation</li> </ul>	<ul style="list-style-type: none"> <li>• Recognizes limits of knowledge in common clinical situations and asks for assistance</li> <li>• Recognizes value of humility and respect towards patients and associate staff members</li> <li>• Demonstrates adequate management of personal, emotional, physical, and mental health and fatigue</li> </ul>	<ul style="list-style-type: none"> <li>• Consistently recognizes limits of knowledge in uncommon and complicated clinical situations; develops and implements plans for the best possible patient care</li> <li>• Assesses application of principles of physician wellness, alertness, delegation, teamwork, and optimization of personal performance to the practice of medicine</li> <li>• Seeks out assistance when necessary to promote and maintain personal, emotional, physical, and mental health</li> </ul>	<ul style="list-style-type: none"> <li>• Mentors and models personal and professional responsibility to colleagues</li> <li>• Recognizes signs of physician impairment, and demonstrates appropriate steps to address impairment in colleagues</li> <li>• Takes ownership of patient care responsibilities</li> </ul>	<ul style="list-style-type: none"> <li>• Develops organizational policies and education to support the application of these principles in the practice of medicine</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				



Communication — Interpersonal and Communication Skills				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>Communicates with families about routine care (e.g., actively seeks and understands the patient’s/family’s perspectives)</li> <li>Focuses on the patient’s chief complaint, and asks pertinent questions related to that complaint</li> </ul>	<ul style="list-style-type: none"> <li>Communicates competently within systems and with other care providers, and provides detailed information about patient care</li> <li>Begins to master child-family-physician communication triad</li> </ul>	<ul style="list-style-type: none"> <li>Communicates competently in difficult patient circumstances (e.g., able to customize emotionally difficult information, such as end-of-life or loss-of-limb discussions; supports patient and family)</li> <li>Engages in family-based decision making, incorporating patient and family/cultural values and preferences</li> </ul>	<ul style="list-style-type: none"> <li>Communicates competently in complex/adversarial situations (e.g., parental conflict, custody disputes, child abuse, drug seeking)</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrates leadership in communication activities (e.g., coaches others to improve communication skills)</li> <li>Engages in self-reflection on how to improve communication skills</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				

Teamwork (e.g., physician, nursing and allied health care providers, administrative and research staff) — Interpersonal and Communication Skills				
Level 1	Level 2	Level 3	Level 4	Level 5
<ul style="list-style-type: none"> <li>Recognizes and communicates critical patient information in a timely and accurate manner to other members of the treatment team</li> <li>Recognizes and communicates role as a team member to patients and staff members</li> <li>Responds to requests for information</li> </ul> <p><i>Examples:</i> Lab results, accurate and timely progress notes, answers pages in a timely manner</p>	<ul style="list-style-type: none"> <li>Supports and respects decisions made by the team</li> <li>Actively participates in team-based care; supports activities of other team members, and communicates their role to the patient and family</li> </ul> <p><i>Examples:</i> Hand-offs, transitions of care, communicates with other health care providers and staff members</p>	<ul style="list-style-type: none"> <li>Able to facilitate, direct, and delegate team-based patient care activities</li> <li>Understands the OR team leadership role and obligations</li> </ul> <p><i>Examples:</i> Leads daily rounds, communicates plan of action with OR personnel</p>	<ul style="list-style-type: none"> <li>Leads team-based care activities and communications</li> <li>Able to identify and rectify problems with team communication</li> </ul> <p><i>Example:</i> Organizes and verifies hand-off rounds, coverage issues</p>	<ul style="list-style-type: none"> <li>Seeks leadership opportunities within professional organizations</li> <li>Able to lead/facilitate meetings within organization/system</li> </ul>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Comments:</b>				