

AO Trauma Competencies

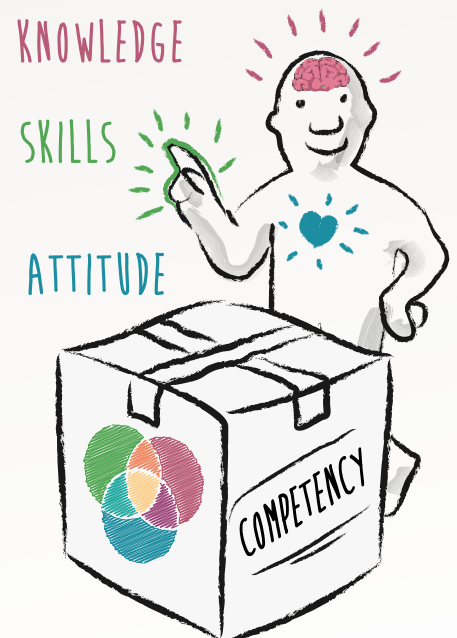
AO Trauma Pediatrics Curriculum

(Last update: 27.04.2017)

The education taskforce has identified the following competencies for this area of practice:

1. Recognize that the outcome of similar injury patterns varies with a child's age and adapt treatment accordingly
2. Manage relationships with patient and parents/relatives
3. Establish the natural history and decide on a treatment strategy
4. Assess the patient based on developmental status and make decisions based on available team/infrastructure
5. Perform the chosen treatment procedure
6. Perform and document short- and long-term follow-up; apply findings to decision making
7. Diagnose and treat septic arthritis in a timely manner
8. Recognize and address signs and patterns of nonaccidental injury
9. Diagnose and treat slipped capital femoral epiphysis
10. Manage acquired and congenital deformity
11. Manage pathological bone
12. Recognize and stabilize the pediatric polytrauma patient

A competency is a combination of attributes underlying professional performance. It is the combination of knowledge, skill, or attitude that enables a physician to actively perform in his or her practice setting. Practically, a competency describes what the physician must be able to do to provide patient care, addressing the common and critical problems.



Competency 1—Recognize that the outcome of similar injury patterns varies with the child’s age and adapt treatment accordingly



Knowledge



Skills



Attitude

01.01 Describe normal skeletal children’s anatomy and physiology

Update incl skeletal maturity

01.02 Discuss age-related pathophysiology including healing response at different ages and how it can aid or complicate treatment

01.03 Describe available classification systems and how to use them

01.04 Classify injuries to select optimal treatment

For experts more detailed level of classification

01.05 Describe the available age-dependent techniques and describe the expected outcomes for injuries and treatment modalities based on evidence

01.06 Interpret diagnostic imaging according to age and anatomical region

01.07 Evaluate the expected outcomes for injuries and treatment options

01.08 Recognize differences in treatment options that may produce equivalent outcomes

Evidence based

01.09 Describe the differences between investigations for children to those for adults

eg, x-ray, ultrasound, arthrography, MRI, CT, blood tests

01.10 Identify and interpret abnormal findings from test results

New technology

01.11 Compare the principles of operative vs nonoperative treatment

New technologies for experts

01.12 Learn and perform “new” techniques to optimize outcomes

New technologies

01.13 Do not try to solve all problems alone

01.14 Avoid dogmatic ideas

eg, “always treat nonoperatively” or “a child will always adapt”

01.15 Develop a diagnosis from a differential diagnosis eg, pathological conditions

eg, “always treat nonoperatively” or “a child will always adapt”

Competency 2—Manage relationships with patient and parents/relatives



Knowledge



Skills



Attitude

02.01 Communicate with and educate patient/parents/relatives/other agencies

02.02 Describe age-related communicative abilities

02.03 Communicate appropriately with children based on their age-related behavioral response to injury

02.04 Judge the influence of behavior on treatment, rehabilitation, follow-up, and compliance

02.05 Describe “child life” and doctor–child–parent relationships

02.06 Manage doctor–child–parent relationships

02.07 Demonstrate good language skills

Communicate at the right level

02.08 Show empathy

02.09 Describe “actual” family structures

02.10 Identify and apply age-appropriate distress-relieving and pain-management strategies

02.11 Realize that doctors’ own fear of the unknown can be a major barrier when treating children

Competency 3—Establish the natural history and decide on a treatment strategy



Knowledge



Skills



Attitude

03.01 Describe the natural history, primarily influence of age and comorbidity

03.02 Describe the influence of growth on untreated fractures

**03.03 Describe the pattern of injury and investigations to treat each fracture/
injury**

03.04 Describe available treatment options and how age affects outcomes

**03.05 Evaluate treatment options and determine the optimum treatment
according to age and other factors**

**03.06 Address/adapt for medical conditions, eg, obesity, epilepsy, cerebral
palsy, cystic fibrosis, asthma, diabetes, Down syndrome**

**03.07 Apply different treatments that will provide a goal appropriate to the
patient**

**03.08 Recognize the value of nonoperative treatment with equivalent
outcomes**

03.09 Recognize and manage the expectations of the patient and relatives

**03.10 Be prepared (and prepare patients/relatives) to change treatment if
necessary**

**03.11 Communicate treatment options and strategy adequately to patients and
relatives**

03.12 Be prepared to refer the child when appropriate

03.13 Stabilize the patient and/or injury for transfer following referral

Competency 4—Assess the patient based on developmental status and make decisions based on available team/infrastructure



Knowledge



Skills



Attitude

04.01 Describe normal child development regarding motor and communication aspects

04.02 Recognize differences in patient requirements based on physical, psychosocial and education-related factors, systemic (health-care system) factors

04.03 Realize a child is not a small adult

04.04 Recognize that children require high-quality treatment just like adults

04.05 Define aspects other than the injury that may obscure normal capability

Eg, the quiet child, fear, serious injury

04.06 Critically assess the skills of the available multidisciplinary clinical team in managing children

04.07 Assess available infrastructure and equipment

04.08 Develop structures to support needs of the injured child even in case of limited financial resources

04.09 Increase insight by engaging in CPD/CME, revalidation/appraisal measures, audit and peer review

Competency 5—Perform the chosen treatment procedure



Knowledge



Skills



Attitude

05.01 Describe criteria/strategies for selecting nonoperative or operative options including potential complications

Explain absolute vs relative stability

05.02 Manage the whole patient from start to finish

05.03 Perform planning for operative and nonoperative treatment including preoperative and perioperative

Ensure that instruments are correct

05.04 Prepare the patient—marking, anesthesia, postoperative care, positioning and imaging

05.05 Perform surgical approaches and techniques

(indications/limitations)
appropriately use of equipment/instruments/implants

05.06 Manage the patient perioperatively

05.07 Minimize the risk of complication and manage complications when they arise

Posttraumatic and congenital deformity

05.08 Describe nonoperative treatment options—properties of plaster/fiber casts, complications of casting

05.09 Apply nonoperative treatment, eg, manipulative reduction and casting

05.10 Apply wound closure techniques—splint/cast

05.11 Prevent/treat complications of casting

05.12 Prevent and recognize (early) compartment syndrome; recognize silent compartment syndrome

ie, children can be different to adults

05.13 Manage patient rehabilitation and follow-up

05.14 Observe and immobilize lateral and medial condylar fractures

Lateral and medial condyle fractures

05.15 Interpret arthogram, ultrasound and EUA of lateral and medial condylar fractures (evaluation under anesthesia)

Lateral and medial condyle fractures

05.16 Perform closed reduction and percutaneous fixation of lateral and medial condylar fractures (K-wires, smooth/threaded wires, cannulated screws)

Lateral and medial condyle fractures
Elbow

05.17 Perform open reduction and fixation of lateral and medial condylar fractures (K-wires, smooth/threaded wires, cannulated screws)

Lateral and medial condyle fractures
Elbow

05.18 Interpret arthogram, ultrasound and EUA lateral and medial condylar fractures (evaluation u. anesthesia)

Lateral and medial condyle fractures
Elbow

05.19 Observe and immobilize medial epicondyle fractures

Medial epicondyle fractures
Elbow

05.20 Perform closed reduction and fixation of medial condylar fracture (K-wires, smooth/threaded wires, cannulated screws)

Medial epicondyle fractures
Elbow

05.21 Perform plate fixation of adolescent elbow fracture patterns

Adolescent elbow fracture patterns

05.22 Perform fixation with cannulated screws of adolescent elbow fracture patterns

Adolescent elbow fracture patterns

05.23 Apply external fixator for adolescent elbow fracture patterns

Adolescent elbow fracture patterns

05.24 Apply traction for supracondylar fracture

Supracondylar fracture
Elbow

05.25 Treat Blount's—closed reduction and splinting/cast (type 1 + 2) of supracondylar fracture

Supracondylar fracture
Elbow

05.26 Perform open reduction and fixation of supracondylar fracture

Supracondylar fracture
Elbow

05.27 Perform closed reduction and percutaneous wire fixation of supracondylar fractures (crossed lateral parallel and divergent)

Supracondylar fracture
Elbow

05.28 Manage vascular and nerve problems in supracondylar fractures

Supracondylar fracture
Elbow

05.29 Perform closed reduction and ESIN of supracondylar fractures

Supracondylar fracture
Elbow

05.30 Apply lateral external fixator for supracondylar fractures

Supracondylar fracture
Elbow

05.31 Observe undisplaced radial neck fractures

Radial neck fractures
Elbow

05.32 Perform closed reduction and apply plaster cast for radial neck fracture

Radial neck fractures
Elbow

05.33 Perform closed reduction and ESIN of radial neck fracture

Radial neck fractures
Elbow

05.34 Apply “Closed” reduction, joystick/lever for radial neck fracture

Radial neck fractures
Elbow

05.35 Avoid open reduction and internal fixation of radial neck fracture

Radial neck fractures
Elbow

05.36 Perform closed reduction and cast of Monteggia fracture dislocation

Monteggia fracture dislocation
Elbow

05.37 Perform closed reduction and ESIN of Monteggia fracture dislocation

Monteggia fracture dislocation
Elbow

05.38 Perform open reduction and internal fixation of Monteggia fracture dislocation

Monteggia fracture dislocation
Elbow

05.39 Interpret arthrogram, ultrasound and EUA of Monteggia fracture dislocation (evaluation u. anesthesia)

Monteggia fracture dislocation
Elbow

05.40 Perform ligament reconstruction of Monteggia fracture dislocation (annular)

Monteggia fracture dislocation
Elbow

05.41 Look for and address missed or neglected lesion/Monteggia fracture dislocation

Monteggia fracture dislocation
Elbow

05.42 Apply K-wires in the distal femur

Distal femur
Knee

05.43 Apply screws (cannulated) in the distal femur

Distal femur
Knee

05.44 Perform plate fixation of the distal femur

Distal femur
Knee

05.45 Perform closed reduction of patellar dislocation

Patella ACL, tibial spine

05.46 Apply K-wires/tension wiring in the patella ACL, tibial spine

Patella ACL, tibial spine
Knee

05.47 Perform screw fixation (cannulated) of patella ACL, tibial spine

Patella ACL, tibial spine
Knee

05.48 Apply anchors in the patella ACL, tibial spine

Patella ACL, tibial spine
Knee

05.49 Apply bioabsorbable materials in the patella ACL, tibial spine

Patella ACL, tibial spine
Knee

05.50 Suture patella ACL, tibial spine

Patella ACL, tibial spine
Knee

05.51 Perform ACL reconstruction of the patella ACL, tibial spine

Patella ACL, tibial spine
Knee

05.52 Apply K-wires in proximal tibia-tibial tuberosity, physeal/ metaphyseal tibia

Proximal tibia-tibial tuberosity, physeal/metaphyseal tibia
Knee

05.53 Perform screw fixation (cannulated) of proximal tibia-tibial tuberosity, physeal/ metaphyseal tibia

Proximal tibia-tibial tuberosity, physeal/metaphyseal tibia
Knee

05.54 Perform plate fixation of proximal tibia-tibial tuberosity, physeal/ metaphyseal tibia

Proximal tibia-tibial tuberosity, physeal/metaphyseal tibia
Knee

05.55 Observe and immobilize undisplaced, stable diaphyseal humeral fractures

Humerus
Pediatric long bones

05.56 Apply functional bracing to undisplaced, stable diaphyseal humeral fractures

Humerus
Pediatric long bones

05.57 Apply ESIN to unstable, displaced humeral fractures

Humerus
Pediatric long bones

05.58 Apply external fixator to unstable, displaced humeral fractures

Humerus
Pediatric long bones

05.59 Apply plate fixation to unstable, displaced humeral fractures

Humerus
Pediatric long bones

05.60 Observe and immobilize stable, undisplaced forearm fractures

Forearm
Pediatric long bones

05.61 Apply plaster cast to stable, undisplaced forearm fractures

Forearm
Pediatric long bones

05.62 Apply ESIN to displaced, unstable forearm fractures

Forearm
Pediatric long bones

05.63 Apply ExFix to displaced, unstable forearm fractures

Forearm
Pediatric long bones

05.64 Perform plate fixation of displaced, unstable forearm fractures

Forearm
Pediatric long bones

05.65 Observe and immobilize undisplaced, stable femoral fractures

Femur
Pediatric long bones

05.66 Apply traction to displaced, unstable femoral fractures

Femur
Pediatric long bones

05.67 Apply hip spica cast to undisplaced, stable femoral and displaced, unstable femoral fractures

Femur
Pediatric long bones

05.68 Apply ESIN to displaced, unstable femoral fractures

Femur
Pediatric long bones

05.69 Apply external fixator to displaced, unstable femoral fractures

Femur
Pediatric long bones

05.70 Apply ALFN (adolescent lateral femoral nail) to displaced, unstable femoral fractures

Femur
Pediatric long bones

05.71 Perform plate fixation of displaced, unstable femoral fractures

Femur
Pediatric long bones

05.72 Observe and immobilize undisplaced, stable tibial fractures

Tibia
Pediatric long bones

05.73 Perform reduction and apply plaster cast to stable tibial fractures

Tibia
Pediatric long bones

05.74 Apply ESIN to displaced, unstable tibial fractures

Tibia
Pediatric long bones

05.75 Apply ExFix to displaced, unstable tibial fractures

Tibia
Pediatric long bones

05.76 Perform plate fixation to displaced, unstable tibial fractures

Tibia
Pediatric long bones

05.77 Observe and immobilize metaphyseal fractures

Metaphyseal fractures

05.78 Perform reduction and apply plaster cast to metaphyseal fractures

Metaphyseal fractures

05.79 Apply K-wires for metaphyseal fractures

Metaphyseal fractures

05.80 Perform screw fixation of metaphyseal fractures

Metaphyseal fractures

05.81 Perform plate fixation of metaphyseal fractures

Metaphyseal fractures

05.82 Apply external fixator for metaphyseal fractures

Metaphyseal fractures

05.83 Observe and immobilize epiphyseal fractures

Epiphyseal fractures

05.84 Perform open/closed reduction of epiphyseal fractures

Epiphyseal fractures

05.85 Apply K-wire for epiphyseal fractures

Epiphyseal fractures

05.86 Perform screw fixation of epiphyseal fractures

Epiphyseal fractures

05.87 Observe and immobilize pelvic and acetabular fractures

Pelvic and acetabular fractures

05.88 Perform closed reduction with pelvic sling of pelvic and acetabular fractures

Pelvic and acetabular fractures

05.89 Perform closed reduction with traction of pelvic and acetabular fractures

Pelvic and acetabular fractures

05.90 Perform closed reduction with binders of pelvic and acetabular fractures

Pelvic and acetabular fractures

05.91 Perform closed reduction with external fixator of pelvic and acetabular fractures

Pelvic and acetabular fractures

05.92 Perform open reduction with external fixator of pelvic and acetabular fractures

Pelvic and acetabular fractures

05.93 Perform open reduction with screw fixation of pelvic and acetabular fractures

Pelvic and acetabular fractures

05.94 Perform open reduction with plate fixation of pelvic and acetabular fractures

Pelvic and acetabular fractures

05.95 Perform closed/open reduction of dislocated hip

Pelvic and acetabular fractures

05.96 Perform assessment, eg, clinical tests, imaging of dislocated patella, elbow, hip

Other dislocation, displacement

05.97 Perform open revision procedures of dislocated patella, elbow, hip

Other dislocation, displacement

05.98 Perform closed and open reduction of displaced clavicular fractures

Other dislocation, displacement

05.99 Perform closed reduction of dislocated shoulder

Other dislocation, displacement

05.100 Observe and immobilize the hand

Hand

05.101 Perform closed reduction and immobilization of the hand

Hand

05.102 Perform closed reduction and percutaneous fixation of the hand

Hand

05.103 Perform open reduction and fixation of the hand

Hand

05.104 Observe and immobilize foot and ankle

Foot and ankle

05.105 Perform closed reduction and immobilization of foot and ankle (casting)

Foot and ankle

05.106 Perform closed reduction and percutaneous fixation of foot and ankle (K-wired cannulated screws)

Foot and ankle

05.107 Perform open reduction and fixation of foot and ankle

Foot and ankle

05.108 Perform assessment and initial prophylactic treatment of open fractures

Open fractures

05.109 Perform debridement of open fractures

Open fractures

05.110 Perform child-specific management of soft-tissue envelope of open fractures

Open fractures

05.111 Perform preservation of the physis and periosteum/perichondrium of open fractures

Open fractures

05.112 Combine different treatment options for multifocal skeletal injuries—same bone

Multifocal skeletal injuries

05.113 Combine treatment options for multifocal skeletal injuries—same limb (incl. floating joint)

Multifocal skeletal injuries

05.114 Combine different treatment options for multifocal skeletal injuries—same patient

Multifocal skeletal injuries

05.115 Observe and immobilize fractures in abnormal bone and consider referral

Fractures in abnormal bone

05.116 Perform closed reduction and plaster cast of fractures in abnormal bone

Fractures in abnormal bone

05.117 Perform open reduction and fixation of fractures in abnormal bone

Fractures in abnormal bone

05.118 Observe and immobilize spine—consider referral

Spine

05.119 Perform open reduction and fixation of spine

Spine

Competency 6—Perform and document short and long-term follow-up; apply findings to decision making



Knowledge



Skills



Attitude

06.01 Describe the expected prognosis related to age and the selected treatment

06.02 Explain healing patterns, healing time, healing signs (radiological)

06.03 Recognize variations from the expected prognosis—positive and negative

06.04 Perform audit and reevaluation

AOCOAC

06.05 Evaluate/adapt treatment individually or change practice based on observation or follow-up

06.06 Recognize that flexibility to change practice is difficult and not always possible

06.07 Ensure the availability of good quality imaging and outcome assessment measures

06.08 Recognize and manage early-complications and early-neglected fractures; up to 3-weeks

eg, physical injury, infection, nonunion, iatrogenic vs inevitable complication

06.09 Recognize that the current evidence for long-term outcome is often less than level III evidence

06.10 Describe the classification and correction potential for functional activity

06.11 Collate an archive of useful information in a format appropriate for future interpretation

06.12 Collaborate constructively in an interdisciplinary environment for follow-up

06.13 Document patient progress (information collection) and collaborate in conducting studies

06.14 Engage with structures/funding providers to support research for the sake of increasing knowledge

06.15 Realize that what we know now is not what we knew 100 years ago or what we will be doing in 100 years

Competency 7—Diagnose and treat septic arthritis in a timely manner



Knowledge



Skills



Attitude

07.01 Describe septic arthritis symptoms, age group, biological factors and treatment

07.02 Recognize that septic arthritis is a common presentation that is potentially life-threatening and with rapid deterioration

07.03 Define the age-related spectrum of probable pathogens and antibiotic sensitivities

07.04 Explain the association with osteomyelitis and recognize the need for long-term review

Stability of fusion construct—biology of bone healing, DM, renal disease; steroid use

07.05 Perform team care to support the unwell child

07.06 Resuscitate the child (in an age appropriate manner)

07.07 Perform surgical approaches to different joints—irrigation, arthroscopy

07.08 Aspirate the joint—refer on to debride the joint

07.09 Salvage the destroyed joint or physis or pathological fractures

If radical resection/reconstruction or failure to heal infection is not possible (pathological fracture in osteomyelitis)

07.10 Do not take risks when in doubt—don't send home

Competency 8—Recognize and address signs and patterns of nonaccidental injury



Knowledge



Skills



Attitude

08.01 Describe the signs and patterns of nonaccidental injury

08.02 Examine the whole child: investigate all injuries; recognize/be alert for patterns, inconsistencies or signs suggestive of nonaccidental injury

08.03 Differentiate between normal accidental injury and nonaccidental injury

08.04 Always consider the possibility non-accidental injury in the differential diagnosis

08.05 Describe nonaccidental injury presentations—subtle, delayed, dependent on other family members: poor attachment/overprotection

08.06 Define steps to be taken once there is a suspicion of nonaccidental injury

08.07 Recognize that physical abuse is not the only form, eg, induced seizures following poisoning, Munchausen Syndrome by Proxy, neglect

Systemic

08.08 Recognize that for nonaccidental injury teamwork is of crucial importance

08.09 Know your socio-legal obligations in your own environment

Systemic

Competency 9—Diagnose and treat slipped capital femoral epiphysis



Knowledge



Skills



Attitude

09.01 Explain symptoms and examination findings

Eg, infection, swelling, bleeding, loss of reduction

09.02 Interpret symptoms and examination findings

09.03 Classify by means of tests/investigations

09.04 Apply the “Bernese approach” to the problem

09.05 Recognize that SCFE is an urgent condition that must be treated to avoid catastrophe

09.06 Perform “Bernese” realignment techniques

“Bernese model”—can this be elaborated?

09.07 Interpret findings—ultrasound, x-ray, MRI

09.08 Recognize when acute correction and fixation is an option vs total reconstructive/salvage procedures

09.09 Be prepared to ask for help to avoid complications

09.10 Avoid deterioration by in situ epiphysiodesis

Competency 10—Manage acquired and congenital deformity



Knowledge



Skills



Attitude

10.01 Plan intervention/observations of deformity as necessary following risk assessment, eg, cyst/tumor

Different example:
Physical injury
Acetabular dysplasia

10.02 Describe the operative and nonoperative options for orthopedic work

10.03 Adapt deformity treatment to etiology single procedure

10.04 Analyze the deformity and function

10.05 Identify if the deformity is progressive or nonprogressive

10.06 Perform reconstruction of the limb

10.07 Address any persistence or recurrence of the deformity

10.08 Perform salvage procedures

10.09 Describe the nonoperative management options, eg, orthotics

10.10 Recognize that in orthopedic work teamwork is of crucial importance

10.11 Recognize and manage complications of established posttraumatic deformities

Goals: (1) to analyze the remaining correction potential (2) timing of correction (3) influence of mechanical access on adjacent joints.

Competency 11—Manage pathological bone



Knowledge



Skills



Attitude

11.01 Plan intervention/observations of pathology as necessary following risk assessment, eg, cyst/tumor

11.02 Recognize and manage emergencies of bone and joint infections

11.03 Recognize and manage complications of bone and joint infections

11.04 Adapt treatment to etiology single procedure

11.05 Identify if the pathology is progressive or nonprogressive

11.06 Address any persistence or recurrence of the pathology

11.08 Describe the nonoperative management options

11.09 Coordinate multidisciplinary teams

Competency 12—Recognize and stabilize the pediatric polytrauma patient



Knowledge



Skills



Attitude

12.01 Recognize physiology related to age, including physiological response to trauma

12.02 Perform pediatric resuscitation

12.03 Manage injuries in the emergency situation

(stabilization or transfer)

12.04 Perform life support and fracture stabilization

12.05 Describe treatment options/priorities and their validity (polytrauma)

What is the evidence?

12.06 Recognize a child's compensation mechanisms

12.07 Describe the difference between multiple injury and polytrauma

To do with who leads in a multidisciplinary team

12.08 Differentiate between multiple injuries and polytrauma

12.09 Discuss prioritization of trauma patients—health-care economics/institutional and age-related prejudice

12.10 Discuss early total care vs damage control orthopedics, including multispecialty engagement

Knowledge for core audience needs to be ensured

12.11 Recognize how and when to get help from other healthcare professionals

12.12 Discuss the value of a multidisciplinary care team