Injuries in Orthopedics

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AGENDA

- Traumatic fractures
- Dislocations
- Connective tissue and muscle injuries

Traumatic Fractures

- Type of fracture
  - Closed
  - Open
    - Gustilo classification for open fractures
- Stage of healing
  - routine or delayed
- Complications
  - nonunion or malunion
Traumatic Fractures

Shoulder injuries
- S42.151A Displaced fracture of neck of scapula, right shoulder, initial encounter for closed fracture
- S43.151A Posterior dislocation of right acromioclavicular joint, initial encounter

Hip injuries
- S72.25XA Displaced subtrochanteric fracture of right femur, initial encounter for closed fracture
- S73.121A Ischiocapsular (ligament) sprain of right hip, initial encounter

Principle of Injury coding

- Fractures of specified sites are coded individually by site in accordance with the provisions of categories S02, S12, S22, S32, S42, S52, S 62, S72, S82, S92 and the level of detail in the medical record.
Principles of Injury Coding

- A fracture not indicated as open or closed should be coded as closed
- A fracture not indicated whether displaced or non-displaced should be coded to displaced

Traumatic Fractures

- Codes include:
  - Type
  - Anatomic Site
  - Localization
  - Laterality

- Correct code assignment is dependant upon understanding terminology used in regards to bones and fractures
Types of Bones

• Long bones - bones that are longer than they are wide and have a growth plate. Examples include the femur and phalanges.
• Short - approximately as wide as they are long and have a primary function of providing support and stability with little movement. Examples include carpals and tarsals.

Types of Bones

• Flat - strong, flat plates of bone with the main function of providing protection to the bodies’ vital organs and being a base for muscular attachment. Examples include the scapula and cranium.
• Irregular - bones which do not fall into any other category, due to their non-uniform shape. Examples include the vertebrae and sacrum.
• Sesamoid - usually short or irregular bones, imbedded in a tendon. Examples include the patella and pisiform (smallest of the Carpals).
Localization

- Diaphysis - shaft of a long bone
- Epiphysis - end of the shaft of a long bone
- Metaphysis - growth plate region of a bone

Localization

- Condyle - rounded projection on the end of a bone and is usually found at the point of articulation
- Intercondylar - is located between two condyles

The Lateral and medial epicondyles are a rounded projection of the bone prior to the condyle which serves as a place of attachment of ligaments.

- Lateral Epicondyle - located on the lateral side of the bone
- Medial Epicondyle – located on the medial side of the bone
Localization

- Malunion - a faulty union of the fragments of the fractured bone
- Nonunion - the failure of the ends of the fractured bone to unite.

Example

Bobby injured his arm during a fall from a tree. After an examination and review of films he is diagnosed with an extraarticular fracture of the left distal radius.

S52.552A Other extraarticular fracture of the lower end of left radius, initial encounter for closed fracture
W14.XXXA Fall from tree, initial encounter
Fracture Type

• **Greenstick** - incomplete fracture in which the bone is fractured on one side and bent on the other. This type occurs most often in children.

• **Bent Bone** - a fracture where the bone is bent, creating multiple tiny fractures along the bone. This type of fracture is difficult to diagnosis as the fractures do not show up on x-rays.

Fracture Type

• **Spiral** - a bone fracture caused by a twisting force. It may also be called a torsion fracture.

• **Comminuted** - a fracture in which the bone fragments into several pieces. Comminuted fractures are often associated with crush injuries.

• **Segmental** - a fracture in which the bone breaks into two or more large pieces at the fracture site. This type of fracture frequently causes soft tissue injure and are usually the result of high-energy trauma, such as car accidents.
Example

Charlotte was attempting to keep her eight year-old grandson from running into the corner of a display case. She struck her right arm on the case which was subsequently struck by and his head. She reports the pain was immediate and she was unable to flex her hand without pain. Imaging shows a displaced fracture of the mid radius shaft with comminution of multiple bone fragments and splinters.

S52.351A Displaced comminuted fracture of shaft of radius, right arm, initial encounter for closed fracture
W22.09XA Striking against other stationary object, initial encounter
W50.0XXA Accidental hit or strike by another person, initial encounter

Example

Patient is seen in ED after being involved in a traffic accident with several other vehicles. Imaging shows a three part displaced segmental fracture of the right femoral shaft. Patient is brought to the OR for ORIF of the femoral fracture.

S72.361A Displaced segmental fracture of the shaft of the right femur, initial encounter for closed fracture
V89.2XXA Person injured in unspecified motor-vehicle accident, traffic, initial encounter
Fracture Types - continued

- **Transverse** - a fracture at a right angle to the bone’s axis. Usually, transverse fractures occur from some sort of direct blow or heavy repetitive action like running.
- **Compound** - , also known as an open fracture, is a fracture in which broken bone fragments lacerate soft tissue and protrude through an open wound in the skin.
- **Monteggia’s** - is a proximal one third fracture of the ulna with an associated dislocation of the head of the radius.

Fracture Types - continued

- **Galeazzi’s** - (pronounced gah-lə-aht’-sē) fracture is a fracture of the radius shaft with an associated subluxation or dislocation of the distal ulna.
- **Torus** - a partial fracture where the bone is broken on one side and buckles outward on the other side.
- **Oblique** - a fracture which runs diagonally along the axis of a bone.
- **Colle’s** - a fracture of the distal end of radius within one inch of the joint.
Example

Patient suffered an extra-articular fracture of the right distal radius that occurred as the result of a fall onto an outstretched hand. X-ray showed a fracture of the distal radial metaphyseal region with dorsal angulation and impaction but without involvement of the articular surface with evidence of malunion.

S52.531P Colles’ fracture of right radius, subsequent encounter for closed fracture with malunion

Fracture Types- continued

• **Smith’s** - a fracture of the distal end of the radius. The proximal end of the radial fracture is displaced towards the back (dorsal) of the wrist.

• **Barton’s** - an intra-articular fracture of the distal radius with an associated dislocation of the radiocarpal joint.
Fracture Types- continued

- **Bimalleolar** - (pronounced bī–mal-ē-ō-lar) fracture is a fracture of both the lateral malleolus and the medial malleolus of the ankle.
- **Trimalleolar** - (pronounced tri-mal-ē-ō-lar) fracture is a fracture of the lateral malleolus, medial malleolus and the posterior malleolus.
- **Maisonneuve’s** - (pronounced MAY-ZO-euv) fracture is a spiral fracture of the proximal fibula with an associated tear of the distal tibiofibular syndesmosis and interosseous membrane.

Fracture Types- continued

- **Pilon** - a comminuted fracture of the tibia near the ankle. Many times there is an associated fracture of the fibula. This type of fracture is caused by high-energy vertical axial loading which may occur due to a fall from height or motor vehicle accident.
- **Burst** - a fracture of the vertebra caused by a high-energy axial load. This type of fracture is traumatic and may be the result of auto accidents, or falls from height or high speed.
- **Compression** - A vertebral compression fracture is a fracture that occurs when the bones of the spine become broken due to trauma.
While painting his house, Jacob felt the foot of the ladder sink into the ground pitching the ladder to the left, causing him to lose his balance and jump to the ground from two stories up. He is seen in the ED with right ankle and leg pain. Imaging shows a pilon fracture of the tibia and an associated displaced comminuted fracture of the fibula.

S82.872A Pilon fracture of tibia, initial encounter for closed fracture
S82.452A Displaced comminuted fracture of shaft of left fibula, initial encounter for closed fracture
W11.XXXA Fall on and from ladder, initial encounter

Salter –Harris Fractures

• Five Types
  – Type I – Directly across the growth plate
  – Type II – Across growth plate, continues through shaft
  – Type III – Crosses growth plate, travels outward, exit end of bone
  – Type IV – Transects growth plate
  – Type V – Crush injury to bone and growth plate
Example

15-year-old Sarah presents with a displaced fracture of the left distal femur. Plain films reviewed, the fracture is found to be within the growth plate continuing proximally approximately 12 cm through the diaphysis.

S79.122A Salter-Harris Type II physeal fracture of lower end of right femur, initial encounter for a closed fracture

Open Fractures

• Classified by Gustilo classification
• Dependent
  • Mechanism of injury
  • Soft tissue damage
  • Degree of skeletal involvement
• Three major categories
  • Type I
  • Type II
  • Type III
Gustilo Classifications

Type I
• The wound is less than 1 cm with minimal soft tissue injury, wound bed is clean
• The fracture is usually a simple transverse, short oblique fracture, or with minimal comminution.

Type II
• The wound is greater than 1 cm with moderate soft tissue injury
• The fracture is usually a simple transverse, short oblique fracture, or with minimal comminution.

Type III

Type IIIA
– Adequate soft tissue coverage despite soft tissue laceration or high-energy trauma irrespective of size of wound, and includes segmental or severely comminuted fractures.

Type IIIB
– Extensive soft tissue loss with periosteal stripping and bony exposure usually associated with massive contamination.

Type IIIC
– Major arterial injury repair is required for limb salvation.
Example

Patient is seen in emergency department following a motor vehicle accident. Patient was attempting to exit his car when it was struck by another car. He was not fully out of the vehicle, and the resulting impact caused the door to slam shut on his right forearm where it was wedged until assistance arrived.

Assessment: Displaced transverse fracture of right ulna. Open fracture of radius with extensive comminution of the distal shaft fracture. There is also injury due to bone fragments of abductor pollicis longus muscle and possible the laceration of the extender carpi radialis brevis tendon.

Example

S52.351C Displaced comminuted fracture of the shaft of radius, right arm, initial encounter for open fracture type IIIA

S52.221C Displaced transverse fracture of shaft of right ulna, initial encounter for open fracture type IIIA

V43.42XA Person boarding or alighting a car injured in collision with other type car
Initial Encounters

A  initial encounter for closed fracture
B  initial encounter for open fracture type I or II or initial encounter for open fracture NOS
C  initial encounter for open fracture type IIIA, IIIB, or IIIC

CODERS TIP

• Remember, the seventh character must always be the seventh character in the data field. If a code that requires a seventh character is not six characters in length, a placeholder X must be used to fill in the empty characters.

Example

A patient underwent surgery for an open burst fracture of the first lumbar vertebra, which became unstable.

S32.012B Unstable burst fracture of first lumbar vertebra, initial encounter for open fracture
Subsequent Encounters

Subsequent encounters with routine healing

D Subsequent encounter for closed fracture with routine healing
E Subsequent encounter for open fracture type I or II with routine healing
F Subsequent encounter for open fracture type IIIA, IIIB, or IIIC with routine healing

Subsequent Encounters

Subsequent encounters with delayed healing

G subsequent encounter for closed fracture with delayed healing
H subsequent encounter for open fracture type I or II with delayed healing
J subsequent encounter for open fracture type IIIA, IIIB, or IIIC with delayed healing
Subsequent Encounters

• Subsequent encounters with complications:
  – Nonunion
    • K Subsequent encounter for closed fracture with nonunion
    • M Subsequent encounter for open fracture type I or II with nonunion
    • N Subsequent encounter for open fracture type IIIA, IIIB, or IIIC with nonunion

Subsequent Encounters

• Subsequent encounters with complications:
  – Malunion
    • P Subsequent encounter for closed fracture with malunion
    • Q Subsequent encounter for open fracture type I or II with malunion
    • R Subsequent encounter for open fracture type IIIA, IIIB, or IIIC with malunion
Example

A patient presents for a recheck of her closed fracture of the neck of the left radius. X-rays are taken and show a malunion of the fracture.

S52.132P Displaced fracture of neck of left radius, subsequent encounter for closed fracture with malunion

Example

Mr. Johnson presents with complaints of left hip pain. He is six months post total replacement of same. He states that the pain is constant and if he sleeps on his left side he is woken at night by a stabbing pain at the upper end of his thigh. After examining the area and reviewing films, the orthopedist diagnosis the condition as pain due to prosthetic hip.

T84.84XD Pain due to internal orthopedic prosthetic devices, implants and grafts
Late Effects

• Encounters for sequela:
  – Complications or conditions that arise as a direct result of an injury
  – Code first the residual condition followed by the code to identify the condition responsible for the sequela

Example

William presents to the office with increasing right shoulder joint pain and a decrease in the previous range of motion for the same. He was seen in this office six months ago for a comminuted fracture of the right proximal humeral shaft which subsequently healed nicely. X-rays now show necrosis of the humeral head.

M87.221 Osteonecrosis due to previous trauma, right humerus
S42.351S Displaced comminuted fracture of shaft of humerus, right arm, sequela
Fracture Sequencing

• Multiple fractures are sequenced in accordance with the severity of the fracture.

• The provider should be asked to list the fracture diagnoses in the order of severity.

Traumatic Dislocations

• Codes include:
  – Joint
  – Laterality
  – Extent of the dislocation
  – Position of the dislocation
  – 7th character extender
Traumatic Dislocations

• Extent of the Dislocation
  – Subluxation - partial of incomplete dislocation of joint
  – Dislocation - is a complete dislocation of the joint and is also known as luxation of the joint
  – Percentage - Dislocations of certain joints are further classified by the extent based upon percentage of the dislocation.

• The position of a dislocation refers to the position of a bone compared to its correct anatomic location.
  • Position
    – Anterior
    – Posterior
    – Inferior
    – Laterally
Example

10 year-old Sara jumped from her swing while she was swinging on a swing set. She states she landed on her feet but fell forward and landed on her outstretched left arm. When she stood up she had pain at her shoulder and was unable to lift her arm. Plain films were completed.
Assessment: Anterior partial dislocation of right humerus

S43.011A Anterior Subluxation of right humerus, initial encounter

Open Dislocations

- Not a combination code in ICD-10-CM
  - Two codes are needed to identify the injury
    - Dislocation or subluxation
    - Associated open wound

Instructional note at the beginning of each dislocation category directs coder
Example

Jessie was knocked down while feeding her pigs on the farm. She attempted to catch herself on her outstretched left forearm resulting in an open anterior dislocation of the left humerus.

ICD-9-CM
- 831.11 Anterior dislocation of humerus, open

ICD-10-CM
- S43.015A Anterior dislocation of left humerus, initial encounter
- S41.042A Puncture wound with foreign body of left shoulder, initial encounter

Connective Tissue & Muscle Injuries

Connective tissues within the musculoskeletal system work with the muscles and bones to aide in the production of movement, dictate your degree of flexibility, and protect surrounding tissue during muscle movement.

Anatomy
- Fascia - a thin membrane surrounding the muscles, tendons, bones and other organs and tissues.
Anatomy

- **Cartilage** - a tough flexible tissue found in many places throughout the body. In relation to orthopaedics, cartilage cover and protect the end of the bone at the joint and allows the bones to articulate smoothly.

- **Tendons** - strong cords that attach muscle to bone at the point of insertion.

- **Ligaments** - like tendons are tough cords that connect bone to bone. Ligaments provide stability to joints by holding the end of bones in place at the joint.

Connective Tissue & Muscle Injuries

- **Flexor muscles** - contract to bend a body part at the joint

- **Extensor muscles** - contract to straighten a body part at the joint

- **Adductor muscles** - the muscles that contract to bring a body part (limb) toward the median line of the body. These include the adductor brevis, adductor magnus, and adductor longus of the thigh.
Example

While playing basketball with some friends, Tim was attempting to pivot around another player when he bumped into them and lost his balance, placing his weight on the pivoting left foot and wrenching his knee. He was initially seen in the ED and referred to Orthopedics. MRI studies show a complex tear of lateral meniscus.

- S83.272A Complex tear of lateral meniscus, current injury, left knee, initial encounter
- W51.XXXA Accidental striking against or bumped into by another person, initial encounter
- Y93.67 Activity, basketball

Example

James has a two day history of right groin pain. He states he woke up with the pain Sunday and it has continued since that time. Upon exam the area does not appear red or hot to touch. There is minor swelling in the area and the pain to touch and movement is localized to the inner thigh. Assessment: Strained groin muscle.

S76.211A Strain of adductor muscle, fascia and tendon of right thigh, initial encounter
Connective Tissue & Muscle Injuries

- Fasciitis
- Strains
- Sprains
  - Grade 1
  - Grade 2
  - Grade 3

Example

While playing soccer at school, Keegan attempted to retrieve the ball and collided with an opposing team player. Upon attempting to stand he states he immediately felt pain upon standing and ambulating. MRI was reviewed and demonstrated a partial PCL tear of the right knee.

S83.521A Sprain of the posterior cruciate ligament of the right knee, initial encounter
W51.XXXA Accidental striking against or bumping into by another person, initial encounter
Y93.66 Activity, soccer
Thank You!