Radiology Anatomy of the Spine and Upper Extremity

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Learning Objective

• Identify anatomic structures of the spine and upper extremities on standard radiographic and cross-sectional images
SPINE
Visual Human Sagittal View

7 Cervical Vertebra

12 Thoracic Vertebra

5 Lumbar Vertebra

5 Sacral Vertebra (fused)

3 Coccygeal Vertebra (fused)
Lumbar Vertebral Body

- BODY
- PEDICLE
- TRANSVERSE PROCESS (fractured)
- SPINOUS PROCESS
- LAMINA
SPINE FROM THE FRONT

BODY

TRANSVERSE PROCESS
SPECIMEN RADIOGRAPH L4

Lamina and Facets
AP Lumbar Spine
AP Lumbar Spine

- Body
- Pedicle
- Transverse Process
- Spinoous Process
- Lamina
Lateral Lumbar Spine
Lateral Lumbar Spine

BODY

PEDICLE

SPINOUS PROCESS
Lateral Lumbar Spine

SUPERIOR FACET

PARS

INFERIOR FACET
CT Lumbar Spine Sagittal Reconstructions
Facet Joints Axial View

Inferior Facets

Cervical
Thoracic
Lumbar

Superior Facets
Facet Joints Sagittal Reconstructions

Cervical  Thoracic  Lumbar
Intervertebral Disc Space

Neural Foramen

Intervertebral Disc
Intervertebral Disc

Nucleus Pulposa

Annulus Fibrosa

Body

Sagittal Section Lumbar Spine
MRI: Intervertebral Disc

Spinal Cord
(Cauda Equina)

Intervertebral Disc
• Nucleus Pulposa
• Annulus Fibrosa
Cauda Equina

MRI Myelogram
Neural Foramen

Pedicle (L3)

L3 Nerve Root

L3/L4 Intervertebral Disc

Pedicle (L4)
Neural Foramina Cervical Spine

Vertebral Body
Nerve Roots
Cervical Spinal Cord
Facet Joint

Viewed from bottom
Spinal Ligaments

- Ligamentum Flavum
- Intertransverse Ligament
- Facet Capsular Ligament
- Posterior Longitudinal Ligament
- Interspinous Ligament
- Supraspinous Ligament
- Anterior Longitudinal Ligament
Spinal Ligament

Anterior Longitudinal Spinal Ligament

Posterior Longitudinal Spinal Ligament
Case Study: 17 year-old Male involved in a MVA

Do you see a fracture?

Fracture of C7 vertebral body
Case Study: 17 year-old Male involved in a MVA

What other structures are likely to be injured?
Case Study: 17 year-old Male involved in a MVA

Spinal Cord Injury

Anterior Longitudinal Spinal Ligament

Posterior Longitudinal Spinal Ligament
Upper Extremity
Radiographic Anatomy

X-RAY BEAM

FILM
LEFT SHOULDER (FRONT)

CLAVICLE
ACROMION
CORACOID
GLENOID
SCAPULA
HUMERUS
SHOULDER (BACK)

- CLAVICLE
- ACROMION
- SPINE
- GLENOID
- HUMERUS
- SCAPULA
AP Shoulder

- Clavicle
- Acromion
- Coracoid
- Greater Tuberosity
- Glenoid
- Humerus
LEFT SHOULDER AXILLARY VIEW

FILM

X-RAY TUBE
RIGHT SCAPULA FROM BELOW

CORACOID

GLENOID

ACROMION
Case Study: 52 year old male with shoulder pain

Do you identify the cause of the shoulder pain?
MRI Anatomy of the Shoulder
MUSCLES FROM THE FRONT

SUPRASPINATUS

SUBSCAPULARIS
Rotator Cuff Muscles
Sagittal View

Anterior

Subscapularis
Supraspinatus
Infraspinatus
Teres Minor
Rotator Cuff: Subscapularis

Sagittal View

Coronal View
Rotator Cuff: *Supraspinatus*

Sagittal View

Coronal View
MUSCLES FROM THE BACK

SUPRASPINATUS

INFRASPINATUS

TERES MINOR
Rotator Cuff: *Infraspinatus*

Sagittal View

Coronal View
Rotator Cuff: *Teres Minor*

- Sagittal View
- Coronal View
Anatomy Considerations in Rotator Cuff Tears
Impingement of the Rotator Cuff

Coracoacromial Arch
- Acromion
- AC Joint
- Supraspinatus
- Coracoacromial ligament
- Coracoid Process
- Subscapularis

Anterior View
MRI Anatomy of the Rotator Cuff
MRI Anatomy of the Rotator Cuff
Rotator Cuff Tear

Contrast injected into glenohumeral joint

Contrast leaking into subacromial bursa through tear in supraspinatus
The Elbow
LEFT ELBOW FROM FRONT

- Humerus
- Medial Epicondyle
- Lateral Epicondyle
- Trochlea
- Capitulum
- Ulna
- Radial Head

Medial Lateral
Elbow from the Back

- Humerus
- Medial Epicondyle
- Olecranon
- Ulna
- Lateral Epicondyle
- Olecranon fossa
- Radial Head
The Wrist
The Wrist Palmar View

Carpal Bones (Proximal Row)

- Scaphoid
- Lunate
- Triquetrum
- Pisiform
- Radius
- Ulna
The Wrist Palmar View
Carpal Bones (*Proximal Row*)

- Scaphoid
- Lunate
- Triquetrum
- Pisiform
- Radius
- Ulna
The Wrist Palmar View
Carpal Bones (*Distal Row*)
The Wrist Palmar View
Carpal Bones (Distal Row)

- Trapezium
- Trapezoid
- Hamate
- Capitate
- Radius
- Ulna
MR Anatomy of the Wrist

Coronal Wrist

Radius
Lunate
Capitate