Chapter 12

Surface Anatomy and Cross-Sectional Anatomy

Lecture Presentation by
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Introduction

• Surface anatomy is the study of anatomical landmarks on the exterior of the human body
• Knowledge of surface anatomy has practical applications
  • An understanding is critical during medical examinations
  • An understanding is essential for both invasive and noninvasive laboratory procedures
    • Estimating the location of body parts
    • Knowing the palpation points
A Regional Approach to Surface Anatomy

• Surface anatomy is best studied using a regional approach

• The regions are as follows:
  • Head and neck
  • Thorax
  • Abdomen
  • Upper limbs
  • Lower limbs
A Regional Approach to Surface Anatomy

• Head Region
  • Bone areas
    • Supraorbital margin
    • Mental protuberance
    • Body of the mandible
    • Zygomatic bone
    • Angle of the mandible
    • Mastoid process
Figure 12.1b The Head and Neck

The posterior cervical triangle and the larger regions of the head and neck

**KEY TO DIVISIONS OF THE ANTERIOR CERVICAL TRIANGLE**

- **SHT** Suprahyoid triangle
- **SMT** Submandibular triangle
- **SCT** Superior carotid triangle
- **ICT** Inferior carotid triangle

The posterior cervical triangle and the larger regions of the head and neck
A Regional Approach to Surface Anatomy

• Neck Region
  • Bone areas
    • Clavicle
    • Suprasternal notch
    • Manubrium
Figure 12.1a The Head and Neck

- Supraorbital margin
- Auricle of external ear
- Mental protuberance
- Trapezius muscle
- Clavicle
- Suprasternal notch
- Sternum (manubrium)
- Zygomatic bone
- Body of mandible
- Thyroid cartilage
- Cricoid cartilage
- Sternocleidomastoid muscle (clavicular head)
- Sternocleidomastoid muscle (sternal head)

Anterior view
The posterior cervical triangle and the larger regions of the head and neck

KEY TO DIVISIONS OF THE ANTERIOR CERVICAL TRIANGLE

- **SHT** Suprahyoid triangle
- **SMT** Submandibular triangle
- **SCT** Superior carotid triangle
- **ICT** Inferior carotid triangle

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A Regional Approach to Surface Anatomy

• Neck Region
  • Muscle areas
    • Trapezius
    • Sternocleidomastoid
Supraorbital margin
Auricle of external ear
Mental protuberance
Trapezius muscle
Clavicle
Suprasternal notch
Sternum (manubrium)
Zygomatic bone
Body of mandible
Thyroid cartilage
Cricoid cartilage
Sternocleidomastoid muscle (clavicular head)
Sternocleidomastoid muscle (sternal head)
Anterior view
A Regional Approach to Surface Anatomy

- Neck Region
  - Other areas
    - Thyroid cartilage
    - Cricoid cartilage
• Neck Triangles
  • Anterior cervical triangle
  • Posterior cervical triangle
  • Triangles are separated by the sternocleidomastoid muscle
The posterior cervical triangle and the larger regions of the head and neck.
A Regional Approach to Surface Anatomy

• Anterior Cervical Triangle
  • Subdivided into:
    • Suprahyoid triangle
    • Submandibular triangle
    • Superior carotid triangle
    • Inferior carotid triangle
KEY TO DIVISIONS OF THE ANTERIOR CERVICAL TRIANGLE

- **SHT** Suprahyoid triangle
- **SMT** Submandibular triangle
- **SCT** Superior carotid triangle
- **ICT** Inferior carotid triangle

ANTERIOR CERVICAL TRIANGLE:
- Angle of mandible
- Site for palpation of submandibular gland and submandibular lymph nodes
- Hyoid bone
- Thyroid cartilage
- Supraclavicular fossa
- Trapezius muscle
- Omohyoid muscle

POSTERIOR CERVICAL TRIANGLE:
- Mastoid process
- Sternocleidomastoid region
- External jugular vein beneath platysma
- Site for palpation of carotid pulse
- Location of brachial plexus
- Acromion
- Clavicle
- Sternocleidomastoid muscle (clavicular head [lateral] and sternal head [medial])
A Regional Approach to Surface Anatomy

• Anterior Cervical Triangle
  • Sites for the palpation of the following:
    • Submandibular gland
    • Submandibular lymph nodes
    • Thyroid cartilage
    • Jugular notch
    • Carotid pulse
KEY TO DIVISIONS OF THE ANTERIOR CERVICAL TRIANGLE

- **SHT** Suprahyoid triangle
- **SMT** Submandibular triangle
- **SCT** Superior carotid triangle
- **ICT** Inferior carotid triangle

- **Angle of mandible**
- **Suprahyoid triangle (SHT)**
- **Submandibular triangle (SMT)**
- **Superior carotid triangle (SCT)**
- **Inferior carotid triangle (ICT)**

- **Hyoid bone**
- **Thyroid cartilage**
- **Supraclavicular fossa**
- **Trapezius muscle**
- **Omohyoid muscle**

- **Angle of mandible**
- **Site for palpation of submandibular gland and submandibular lymph nodes**
- **External jugular vein beneath platysma**
- **Site for palpation of carotid pulse**
- **Location of brachial plexus**

- **Mastoid process**
- **Sternocleidomastoid region**
- **External jugular vein beneath platysma**
- **Site for palpation of carotid pulse**

**ANTERIOR CERVICAL TRIANGLE**

- **Suprahyoid triangle (SHT)**
- **Submandibular triangle (SMT)**
- **Superior carotid triangle (SCT)**

**POSTERIOR CERVICAL TRIANGLE**

- **Mastoid process**
- **Sternocleidomastoid region**
- **External jugular vein beneath platysma**
- **Site for palpation of carotid pulse**

**Location of brachial plexus**

- **Acromion**
- **Clavicle**

**Sternocleidomastoid muscle (clavicular head [lateral] and sternal head [medial])**

- **Supraclavicular fossa**
- **Trapezius muscle**
- **Omohyoid muscle**

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A Regional Approach to Surface Anatomy

- Posterior Cervical Triangle
  - Brachial plexus
  - Acromion
  - External jugular vein
KEY TO DIVISIONS OF THE ANTERIOR CERVICAL TRIANGLE

- **SHT** Suprahyoid triangle
- **SMT** Submandibular triangle
- **SCT** Superior carotid triangle
- **ICT** Inferior carotid triangle

**Anatomical Structures**

- **Angle of mandible**
- **Site for palpation of submandibular gland and submandibular lymph nodes**
- **Hyoid bone**
- **Thyroid cartilage**
- **Supraclavicular fossa**
- **Trapezius muscle**
- **Omohyoid muscle**

**Posterior Cervical Triangle**

- **Mastoid process**
- **Sternocleidomastoid region**
- **External jugular vein beneath platysma**
- **Site for palpation of carotid pulse**
- **Location of brachial plexus**
- **Acromion**
- **Clavicle**
- **Sternocleidomastoid muscle (clavicular head [lateral] and sternal head [medial])**

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A Regional Approach to Surface Anatomy

• Thoracic Region
  • Anterior view
    • Bone areas
      • Clavicle
      • Jugular notch
      • Acromion
      • Manubrium
      • Body of sternum
      • Xiphoid process
      • Costal margin of ribs
A Regional Approach to Surface Anatomy

• Thoracic Region
  • Anterior view
    • Muscle areas
      • Pectoralis major muscle
    • Other areas
      • Areola and nipple
      • Axilla
Figure 12.2 The Thorax

- Jugular notch
- Clavicle
- Acromion
- Body of sternum
- Axilla
- Location of xiphoid process
- Costal margin of ribs
- Medial epicondyle
- Median cubital vein
- Sternoceleidomastoid muscle
- Trapezius muscle
- Manubrium of sternum
- Deltoid muscle
- Pectoralis major muscle
- Areola and nipple
- Costal margin of ribs
- Biceps brachii muscle
- Linea alba
- Cubital fossa
- Umbilicus
- The anterior thorax

- Biceps brachii muscle
- Triceps brachii muscle, lateral head
- Triceps brachii muscle, long head
- Deltoid muscle
- Vertebral prominens (C7)
- Trapezius muscle
- Teres major muscle
- Latissimus dorsi muscle

- The back and shoulder regions
A Regional Approach to Surface Anatomy

• Thoracic Region
  • Posterior view
    • Bone areas
      • Vertebra (C₇)
      • Spine of scapula
      • Vertebral border of scapula
      • Inferior angle of scapula
The back and shoulder regions

- Biceps brachii muscle
- Triceps brachii muscle, lateral head
- Triceps brachii muscle, long head
- Deltoid muscle
- Vertebra prominens (C₇)
- Trapezius muscle
- Teres major muscle
- Latissimus dorsi muscle
- Acromion
- Spine of scapula
- Infraspinatus muscle
- Vertebral border of scapula
- Inferior angle of scapula
- Furrow over spinous processes of thoracic vertebrae
- Erector spinae muscles
- Iliac crest
A Regional Approach to Surface Anatomy

• Thoracic Region
  • Posterior view
    • Muscle areas
      • Infraspinatus
      • Trapezius
      • Latissimus dorsi
      • Teres major
  • Other areas
    • Furrow over spinous processes of thoracic vertebrae
Figure 12.2b The Thorax

- Biceps brachii muscle
- Triceps brachii muscle, lateral head
- Triceps brachii muscle, long head
- Deltoid muscle
- Vertebra prominens (C7)
- Trapezius muscle
- Teres major muscle
- Latissimus dorsi muscle
- Erector spinae muscles
- Iliac crest
- Acromion
- Spine of scapula
- Infraspinatus muscle
- Vertebra prominens
- Infraspinatus muscle
- Vertebra prominens
- Infraspinatus muscle
- Vertebra prominens
- Infraspinatus muscle
- Vertebra prominens

The back and shoulder regions
A Regional Approach to Surface Anatomy

• Abdomen Region
  • Anterior view
    • Muscle areas
      • Rectus abdominis
      • Serratus anterior
      • External oblique
  • Other areas
    • Umbilicus
    • Tendinous inscriptions
Figure 12.3a The Abdominal Wall

Xiphoid process

Umbilicus

Rectus abdominis muscle

Anterior superior iliac spine

Inguinal ligament

Inguinal canal

Serratus anterior muscle

Tendinous inscriptions of rectus abdominis muscle

External oblique muscle

Pubic symphysis

The anterior abdominal wall
A Regional Approach to Surface Anatomy

• Abdomen Region
  • Posterior view
    • Muscle areas
      • Latissimus dorsi
      • Erector spinae
Figure 12.2b The Thorax

- Biceps brachii muscle
- Triceps brachii muscle, lateral head
- Triceps brachii muscle, long head
- Deltoid muscle
- Vertebra prominens (C7)
- Spine of scapula
- Infraspinatus muscle
- Acromion
- Infracostal border of scapula
- Inferior angle of scapula
- Furrow over spinous processes of thoracic vertebrae
- Erector spinae muscles
- Iliac crest
- Trapezius muscle
- Teres major muscle
- Latissimus dorsi muscle

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The back and shoulder regions
A Regional Approach to Surface Anatomy

• Upper Limbs: Arm
  • Bone areas
    • Lateral epicondyle
    • Medial epicondyle
  • Muscle areas
    • Deltoid
    • Triceps brachii
    • Biceps brachii
    • Brachialis
    • Coracobrachialis muscle
Figure 12.4a The Upper Limb

- Acromial end of clavicle
- Deltoid muscle
- Teres major muscle
- Triceps brachii muscle, lateral head
- Triceps brachii muscle, long head
- Lateral epicondyle of humerus
- Olecranon
- Anconeus muscle
- Extensor digitorum muscle
- Biceps brachii muscle
- Brachialis muscle
- Brachioradialis muscle
- Extensor carpi radialis longus muscle
- Extensor carpi radialis brevis muscle
- Styloid process of radius
- Head of ulna

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Figure 12.4b The Upper Limb

- Vertebral border of scapula
- Teres major muscle
- Inferior angle of scapula
- Triceps brachii muscle, long head
- Triceps brachii muscle, medial head
- Tendon of insertion of triceps brachii muscle
- Medial epicondyle of humerus
- Site of palpation for ulnar nerve
- Anconeus muscle
- Flexor carpi ulnaris muscle
- Extensor carpi ulnaris muscle

- Spine of scapula
- Infraspinatus muscle
- Location of axillary nerve
- Triceps brachii muscle, lateral head
- Latissimus dorsi muscle
- Olecranon
- Brachioradialis muscle
- Extensor carpi radialis longus muscle
- Extensor carpi radialis brevis muscle
- Extensor digitorum muscle

Posterior view of the thorax and right upper limb
A Regional Approach to Surface Anatomy

- Upper Limbs: Forearm
  - Bone areas
    - Olecranon
    - Styloid process of radius
    - Head of ulna
A Regional Approach to Surface Anatomy

• Upper Limbs: Forearm
  • Muscle areas
    • Anterior view
      • Brachioradialis
      • Flexor carpi radialis muscle
      • Pronator teres muscle
      • Tendon of the flexor carpi radialis muscle
      • Tendon of the palmaris longus muscle
      • Tendon of flexor carpi ulnaris muscle
      • Tendon of flexor digitorum superficialis muscle

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A Regional Approach to Surface Anatomy

• Upper Limbs: Forearm
  • Muscle areas
    • Posterior view
      • Brachioradialis
      • Extensor carpi radialis (longus and brevis)
      • Anconeus
      • Extensor digitorum
A Regional Approach to Surface Anatomy

• Upper Limbs: Arm and Forearm
  • Other areas
    • Cephalic vein
    • Basilic vein
    • Median cubital vein
    • Cubital fossa
    • Site for radial pulse
    • Site for palpation of ulnar nerve

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Figure 12.5 The Arm, Forearm, and Wrist

- Deltoid muscle
- Pectoralis major muscle
- Coracobrachialis muscle
- Cephalic vein
- Biceps brachii muscle
- Triceps brachii muscle, long head
- Cephalic vein
- Basilic vein
- Medial epicondyle
- Cubital fossa
- Brachioradialis muscle
- Median cubital vein
- Pronator teres muscle
- Flexor carpi radialis muscle
- Tendon of flexor digitorum superficialis muscle
- Tendon of palmaris longus muscle
- Tendon of flexor carpi ulnaris muscle
- Head of ulna
- Pisiform bone with palmaris brevis muscle
- Site for palpation of radial pulse
Figure 12.4b The Upper Limb

- Vertebral border of scapula
- Spine of scapula
- Infraspinatus muscle
- Location of axillary nerve
- Triceps brachii muscle, lateral head
- Latissimus dorsi muscle
- Olecranon
- Brachioradialis muscle
- Extensor carpi radialis longus muscle
- Extensor carpi radialis brevis muscle
- Extensor digitorum muscle
- Medial epicondyle of humerus
- Site of palpation for ulnar nerve
- Anconeus muscle
- Flexor carpi ulnaris muscle
- Extensor carpi ulnaris muscle
- Posterior view of the thorax and right upper limb
A Regional Approach to Surface Anatomy

- Upper Limbs: Arm and Forearm
  - Wrist area
    - Pisiform bone
    - Head of ulna
    - Site for radial pulse palpation
A Regional Approach to Surface Anatomy

• The Pelvis and Gluteal Region
  • Muscle area
    • Gluteus maximus
    • Gluteus medius
  • Other areas
    • Location of sciatic nerve
    • Gluteal fold (fold of buttock)
    • Gluteal injection site
Figure 12.6c The Pelvis and Lower Limb

- Median sacral crest
- Gluteal injection site
- Gluteus medius muscle
- Gluteus maximus muscle
- Fold of buttck
- Location of sciatic nerve
- Hamstring muscle group
- Tendon of semitendinosus muscle
- Tendon of biceps femoris muscle
- Popliteal fossa
- Site for palpation of popliteal artery

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A Regional Approach to Surface Anatomy

• The Pelvis and Lower Limb
  • Bone areas
    • Greater trochanter of femur
    • Patella
Figure 12.6b The Pelvis and Lower Limb

- Tensor fasciae latae muscle
- Gluteus medius muscle
- Gluteus maximus muscle
- Iliotibial tract
- Semitendinosus and semimembranosus muscles
- Tendon of biceps femoris muscle
- Vastus lateralis muscle
- Patella
- Patellar ligament
- Tibial tuberosity
- Fibularis longus muscle
- Popliteal fossa
- Head of fibula
- Gastrocnemius muscle
- Soleus muscle

Lateral surface of right thigh and gluteal region
Posterior surfaces of thigh and gluteal region

- Median sacral crest
- Gluteal injection site
- Gluteus medius muscle
- Gluteus maximus muscle
- Fold of buttock
- Greater trochanter of femur
- Location of sciatic nerve
- Hamstring muscle group
- Tendon of semitendinosus muscle
- Poohleal fossa
- Tendon of biceps femoris muscle
- Site for palpation of popliteal artery

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A Regional Approach to Surface Anatomy

• The Pelvis and Lower Limb
  • Anterior thigh
    • Muscle area
      • Tensor fasciae latae
      • Sartorius
      • Rectus femoris
      • Vastus lateralis
      • Vastus medialis
      • Gracilis
      • Adductor longus
A Regional Approach to Surface Anatomy

• The Pelvis and Lower Limb
  • Posterior thigh
    • Muscle area
      • Tendon of biceps femoris muscle
      • Tendon of semitendinosus muscle
      • Hamstring muscle group
A Regional Approach to Surface Anatomy

• The Pelvis and Lower Limb
  • Medial thigh
    • Femoral triangle
    • Inguinal ligament
A Regional Approach to Surface Anatomy

• The Knee Region
  • Patella
  • Patellar ligament
  • Popliteal fossa
    • Site for palpation of popliteal artery
  • Tendons of:
    • Biceps femoris
    • Semitendinosus
Figure 12.7a The Leg and Foot

- Rectus femoris muscle
- Vastus medialis muscle
- Adductor magnus muscle
- Gastrocnemius muscle
- Soleus muscle
- Tibial tuberosity
- Patella
- Patellar ligament
- Fibularis longus muscle
- Anterior border of tibia
- Tibialis anterior muscle
- Lateral malleolus of fibula
- Dorsal venous arch

- Tendon of tibialis anterior
- Tendon of extensor digitorum longus
- Tendon of extensor hallucis longus

Right thigh, knee, leg and foot, anterior view
Biceps femoris muscle, long head
Vastus lateralis muscle
Biceps femoris muscle, short head
Popliteal fossa
Site for palpation of popliteal artery
Site for palpation of common fibular nerve
Gastrocnemius muscle, lateral head
Gastrocnemius muscle, medial head
Soleus muscle
Calcaneal tendon
Tendon of fibularis longus muscle
Medial malleolus of tibia
Lateral malleolus of fibula
Calcaneus

Right thigh, knee, leg and foot, posterior view
A Regional Approach to Surface Anatomy

• The Leg and Foot
  • Anterior view
    • Bone area
      • Tibial tuberosity
      • Anterior border of tibia
      • Medial malleolus
      • Lateral malleolus
    • Muscle area
      • Tibialis anterior
      • Fibularis longus
A Regional Approach to Surface Anatomy

• The Leg and Foot
  • Anterior view
    • Other areas
      • Patellar ligament
      • Great saphenous vein
      • Tibialis anterior tendon
      • Extensor hallucis longus tendon
      • Extensor digitorum longus tendons
      • Dorsal venous arch
Figure 12.7a The Leg and Foot

Right thigh, knee, leg and foot, anterior view
A Regional Approach to Surface Anatomy

• The Leg and Foot
  • Posterior view
    • Bone area
      • Calcaneus
    • Muscle area
      • Gastrocnemius
      • Soleus
Figure 12.7b The Leg and Foot

- Biceps femoris muscle, long head
- Vastus lateralis muscle
- Biceps femoris muscle, short head
- Popliteal fossa
- Site for palpation of popliteal artery
- Site for palpation of common fibular nerve
- Gastrocnemius muscle, lateral head
- Gastrocnemius muscle, medial head
- Soleus muscle
- Calcaneal tendon
- Tendon of fibularis longus muscle
- Medial malleolus of tibia
- Lateral malleolus of fibula
- Calcaneus

Right thigh, knee, leg and foot, posterior view
A Regional Approach to Surface Anatomy

• The Leg and Foot
  • Posterior view
    • Other areas
      • Fibular nerve palpation
      • Fibularis longus tendon
      • Calcaneal tendon
      • Posterior tibial artery palpation
Figure 12.7b The Leg and Foot

- Biceps femoris muscle, long head
- Vastus lateralis muscle
- Biceps femoris muscle, short head
- Popliteal fossa
- Site for palpation of popliteal artery
- Site for palpation of common fibular nerve
- Gastrocnemius muscle, lateral head
- Gastrocnemius muscle, medial head
- Soleus muscle
- Calcaneal tendon
- Medial malleolus of tibia
- Site for palpation of posterior tibial artery
- Tendon of fibularis longus muscle
- Lateral malleolus of fibula
- Calcaneus

Right thigh, knee, leg and foot, posterior view
Cross-Sectional Anatomy

• Cross-sectional views are important for understanding radiological techniques

• Standard method of viewing radiological images:
  • View images from the feet toward the head (inferior views)
  • The anterior aspect of the image is toward the top of the page
  • The right side of the image is the left side of the body
Cross-Sectional Anatomy

• Cross Section of the Head at the Optic Chiasm Level
  • Bone structures
    • Nasal
    • Ethmoid
    • Parietal
    • Occipital
    • Occipital protuberance
    • Zygomatic
Figure 12.8 Cross Section of the Head at the Level of the Optic Chiasm

- Ethmoid
- Medial rectus muscle
- Lateral rectus muscle
- Optic nerve
- Optic chiasm
- Optic tract
- Substantia nigra
- Auricular cartilage
- Temporal lobe
- Parietal bone
- Superior sagittal sinus
- Occipital bone
- Ethmoidal air cells
- Zygomatic bone
- Temporalsis muscle
- Hypothalamus
- Cerebral cortex
- Hippocampus
- Cerebellar cortex
- Occipital lobe
- Internal occipital protuberance
Cross-Sectional Anatomy

• Cross Section of the Head at the Optic Chiasm Level
  • Eye structures
    • Optic nerve
    • Optic chiasm
    • Optic tract
    • Medial rectus muscle
    • Lateral rectus muscle
Cross-Sectional Anatomy

- Cross Section of the Head at the Optic Chiasm Level
  - Brain structures
    - Substantia nigra
    - Temporal lobe
    - Occipital lobe
    - Cerebellar cortex
    - Hippocampus
    - Cerebral cortex
    - Hypothalamus
Cross-Sectional Anatomy

• Cross Section of the Head at the Optic Chiasm Level
  • Other structures
    • Ethmoidal air cells
    • Superior sagittal sinus
Cross-Sectional Anatomy

• Cross Section of the Head at the Level of Vertebra C₂
  • Bone structures
    • Body of axis
    • Maxilla
    • Ramus of mandible
Cross-Sectional Anatomy

• Cross Section of the Head at the Level of Vertebra C\textsubscript{2}
  • Muscles
    • Orbicularis oris
    • Sternocleidomastoid
    • Capitis muscles
    • Buccinator
    • Masseter
    • Pterygoids
    • Splenius
    • Trapezium

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Cross-Sectional Anatomy

• Cross Section of the Head at the Level of Vertebra C₂
  • Other structures
    • Median lingual raphe
    • Internal carotid artery
    • Internal jugular vein
    • Vertebral artery
    • Spinal cord
Figure 12.9 Cross Section of the Head at the Level of Vertebra C₂

- **Orbicularis oris muscle**
- **Maxilla**
- **Buccinator muscle**
- **Masseter muscle**
- **Ramus of mandible**
- **Pterygoid muscle**
- **Longus capitis muscle**
- **Vertebral artery**
- **Spinal cord**
- **Longissimus capitis muscle**
- **Splenius muscle**
- **Semispinalis capitis muscle, lateral part**
- **Trapezius muscle**

- **Median lingual raphe**
- **Body of C₂ (Axis)**
- **Internal carotid artery**
- **Internal jugular vein**
- **Sternocleidomastoid muscle**
- **Obliquus capitis inferior muscle**
- **Rectus capitis posterior major muscle**
- **Semispinalis capitis muscle, medial part**
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra T₂
  • Bone structures
    • Clavicle
    • Body of T₂
    • Humerus
    • Scapula
Figure 12.10 Cross Section at the Level of Vertebra T₂

- Trachea
- Esophagus
- Clavicle
- Subclavius muscle
- Body of T₂
- Shoulder joint
- Subscapularis muscle
- Infraspinatus muscle
- Splenius cervicis muscle
- Trapezius muscle
- Spinal cord
- Sternocleidomastoid muscle (sternal head)
- Sternothyroid muscle
- Common carotid artery
- Pectoralis major muscle
- Pectoralis minor muscle
- Subclavian artery
- Humerus
- Scapula
- Deltoid muscle
- Left lung
- Rhomboid major muscle
- Multifidus muscle

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Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra T2
  • Muscles
    • Subclavius
    • Subscapularis
    • Infraspinatus
    • Splenius cervicis
    • Trapezius
    • Sternocleidomastoid
Figure 12.10 Cross Section at the Level of Vertebra T₂

- Trachea
- Esophagus
- Clavicle
- Subclavius muscle
- Body of T₂
- Shoulder joint
- Subscapularis muscle
- Infraspinatus muscle
- Splenius cervicis muscle
- Trapezius muscle
- Sternocleidomastoid muscle (sternal head)
- Spinal cord
- Multifidus muscle
- Rhomboid major muscle
- Left lung
- Deltoid muscle
- Scapula
- Humerus
- Common carotid artery
- Pectoralis major muscle
- Pectoralis minor muscle
- Subclavian artery
- Sternothyroid muscle
- Sternothyroid muscle
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra T2
  • Muscles (continued)
    • Sternothyroid
    • Pectoralis major and minor
    • Deltoid
    • Rhomboid major
    • Multifidus
Figure 12.10 Cross Section at the Level of Vertebra T₂

- Trachea
- Esophagus
- Clavicle
- Subclavius muscle
- Shoulder joint
- Subscapularis muscle
- Infraspinatus muscle
- Splenius cervicis muscle
- Trapezius muscle
- Spinal cord
- Sternothyroid muscle
- Common carotid artery
- Pectoralis major muscle
- Pectoralis minor muscle
- Subclavian artery
- Humerus
- Scapula
- Deltoid muscle
- Left lung
- Rhomboid major muscle
- Multifidus muscle
Cross-Sectional Anatomy

- Cross Section at the Level of Vertebra T_2
  - Other structures
    - Trachea
    - Lungs
    - Esophagus
    - Shoulder joint
    - Common carotid artery
    - Subclavian artery
    - Spinal cord
Figure 12.10 Cross Section at the Level of Vertebra T₂

- Trachea
- Esophagus
- Clavicle
- Subclavius muscle
- Body of T₂
- Shoulder joint
- Subscapularis muscle
- Infraspinatus muscle
- Splenius cervicis muscle
- Trapezius muscle
- Spinal cord
- Sternocleidomastoid muscle (sternal head)
- Sternothyroid muscle
- Common carotid artery
- Pectoralis major muscle
- Pectoralis minor muscle
- Subclavian artery
- Humerus
- Scapula
- Deltoid muscle
- Left lung
- Rhomboid major muscle
- Multifidus muscle
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra $T_8$
  • Bone structures
    • Spinous process of $T_8$
    • Body of sternum
    • Ribs 4, 7, 8
Cross-Sectional Anatomy

- Cross Section at the Level of Vertebra T₈
  - Heart structures
    - Tricuspid valve
    - Right atrium
    - Interventricular septum
    - Right ventricle
    - Left ventricle
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra $T_8$
  • Other structures
    • Lungs
    • Oblique fissure of the lungs
    • Esophagus
    • Spinal cord
    • Thoracic aorta
    • Pectoralis major muscle
    • Latissimus dorsi muscle
Figure 12.11 Cross Section at the Level of Vertebra T₈

- Right AV (tricuspid) valve
- Right atrium
- Right lung, middle lobe
- Oblique fissure of right lung
- Interventricular septum
- Esophagus
- Right lung
- Spinal cord
- Spinous process of T₈
- Body of sternum
- Right ventricle
- Pectoralis major muscle
- Rib 4
- Left ventricle
- Left lung, superior lobe
- Oblique fissure of left lung
- Left lung, inferior lobe
- Ribs 7 and 8
- Latissimus dorsi muscle
- Thoracic aorta
- Trapezius muscles
Cross-Sectional Anatomy

- Cross Section at the Level of Vertebra $T_{10}$
  - Bone structures
    - Xiphoid process
    - Body of $T_{10}$
Figure 12.12 Cross Section at the Level of Vertebra $T_{10}$

- Xiphoid process
- Right lobe of liver
- Inferior vena cava
- Azygos vein
- Body of $T_{10}$
- Right lung, inferior lobe
- Multifidus muscle
- Trapezius muscle
- Esophagus
- Cardiac orifice of the stomach
- Cardia of the stomach
- Thoracic aorta
- Spleen
- Diaphragm
- Left lung, inferior lobe
- Latissimus dorsi muscle
- Longissimus thoracis muscle
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra T10
  • Muscles
    • Multifidus
    • Trapezius
    • Longissimus thoracis
    • Latissimus dorsi
    • Diaphragm
Figure 12.12 Cross Section at the Level of Vertebra T₁₀

- Xiphoid process
- Right lobe of liver
- Inferior vena cava
- Azygos vein
- Body of T₁₀
- Right lung, inferior lobe
- Multifidus muscle
- Trapezius muscle
- Esophagus
- Cardiac orifice of the stomach
- Cardia of the stomach
- Thoracic aorta
- Spleen
- Diaphragm
- Left lung, inferior lobe
- Latissimus dorsi muscle
- Longissimus thoracis muscle
- Sacral segments of spinal cord
Cross-Sectional Anatomy

- Cross Section at the Level of Vertebra T_{10}
  - Other structures
    - Liver
    - Inferior vena cava (IVC)
    - Azygos vein
    - Lungs
    - Spinal cord
    - Esophagus
    - Thoracic aorta
    - Stomach
    - Spleen
Cross-Sectional Anatomy

- Cross Section at the Level of Vertebra $T_{12}$
  - Bone structures
    - Rib 9
Cross-Sectional Anatomy

- Cross Section at the Level of Vertebra $T_{12}$
  - Muscles
    - Rectus abdominis
    - Transverse abdominal
    - Intercostals
    - Latissimus dorsi
    - Spinal thoracis
    - Psoas
    - Quadratus lumborum
    - Iliocostalis
    - Longissimus thoracis
Figure 12.13 Cross Section at the Level of Vertebra T₁₂

- Transverse colon
- Jejunum
- Costal cartilage of rib 8
- Rib 9
- Renal artery
- Descending colon
- Renal vein
- Left kidney
- Psoas major muscle
- Quadratus lumborum muscle
- Iliocostalis lumborum muscle
- Longissimus thoracis muscle
- Rectus abdominis muscle
- Transversus abdominis muscle
- Transverse colon
- Intercostal muscles
- Rib 9
- Ascending colon
- Right lobe of liver
- Abdominal aorta
- Diaphragm
- Renal pelvis of right kidney
- Latissimus dorsi muscle
- T₁₂–L₁ intervertebral disc
- Spinal cord
- Spinalis thoracis muscle

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Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra T₁₂
  • Other structures
    • Transverse colon
    • Ascending colon
    • Descending colon
    • Jejunum
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra $T_{12}$
  • Other structures (continued)
    • Liver
    • Abdominal aorta
    • Kidney
    • Intervertebral discs
    • Spinal cord
    • Renal artery and vein
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra L₅
  • Bone structures
    • Spinous process of L₅
    • Ilium
    • Sacrum
    • Ala of sacrum
Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra L₅
  • Muscles
    • Rectus abdominis
    • Longissimus
    • External oblique
    • Internal oblique
    • Transversus abdominis
    • Iliacus
    • Gluteus medius and gluteus maximus

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Figure 12.14 Cross Section at the Level of Vertebra L₅

- Rectus abdominis muscle
- Ileum
- Cecum
- Psoas thoracis muscle
- Sacrum
- Sacro-iliac joint
- Vertebral foramen
- Spinous process of L₅
- Longissimus thoracis muscle
- Ileum
- Descending colon
- External oblique muscle
- Internal oblique muscle
- Transversus abdominis muscle
- Iliacus muscle
- Ilium
- Ala of sacrum
- Gluteus medius muscle
- Gluteus maximus muscle

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Cross-Sectional Anatomy

• Cross Section at the Level of Vertebra L₅
  • Other structures
    • Ileum
    • Cecum
    • Sacro-iliac joint
    • Vertebral foramen
    • Descending colon
Figure 12.14 Cross Section at the Level of Vertebra L₅

- Rectus abdominis muscle
- Ileum
- Cecum
- Psoas thoracis muscle
- Sacrum
- Sacro-iliac joint
- Vertebral foramen
- Spinous process of L₅
- Longissimus thoracis muscle
- Ileum
- Descending colon
- External oblique muscle
- Internal oblique muscle
- Transversus abdominis muscle
- Iliacus muscle
- Ilium
- Ala of sacrum
- Gluteus medius muscle
- Gluteus maximus muscle

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