

Lecture 2: Anatomical and Kinesiological Terminology

The cornerstone of sports science is a precise understanding of the human body. In an international context, relying on translation dictionaries can be dangerous due to the nuances of medical terminology. This lecture focuses on the standardized nomenclature used globally in sports medicine and biomechanics.

2.1 The Etymology of Movement: Latin and Greek Roots

Most English anatomical terms are derived from Latin or Greek. Understanding these roots helps students decode complex words without rote memorization.¹⁵

- *Cardio-* (Greek *kardia*): Heart (e.g., Cardiovascular).
- *Myo-* (Greek *mys*): Muscle (e.g., Myofascial).
- *Osteo-* (Greek *osteon*): Bone (e.g., Osteoporosis).
- *Bi-* (Latin): Two (e.g., Biceps – two heads).
- *Tri-* (Latin): Three (e.g., Triceps – three heads).
- *Sub-* (Latin): Under (e.g., Subscapularis – under the scapula).

Mastery of these prefixes and suffixes allows students to understand terms they have never encountered before. For instance, if a student knows *hyper-* (excessive) and *trophy* (growth), they can deduce that *hypertrophy* refers to muscle growth.¹⁵

2.2 Directional Terminology and Body Orientation

In sports training, ambiguity can lead to injury. Saying “move your arm back” is imprecise. Does “back” mean behind the body, or returning to the starting position? To avoid this, sports scientists use **Directional Terms** based on the Standard Anatomical Position.¹⁶

Table 1: Standard Anatomical Directional Terms

Term	Definition	Antonym	Sports Context Example
Anterior (Ventral)	Toward the front of the body.	Posterior (Dorsal)	“The quadriceps are on the anterior thigh.” ¹⁶
Superior (Cranial)	Toward the head/upper body.	Inferior (Caudal)	“The chest is superior to the abdomen.” ¹⁷
Medial	Toward the midline of the body.	Lateral	“The medial collateral ligament (MCL) is on the inner knee.” ¹⁶

Term	Definition	Antonym	Sports Context Example
Proximal	Closer to the point of attachment/trunk.	Distal	"The elbow is proximal to the wrist." ¹⁸
Superficial	Closer to the body surface.	Deep	"The gastrocnemius is superficial to the soleus." ¹⁷

Pedagogical Insight: Instructors should emphasize that "Left" and "Right" always refer to the *subject's* left and right, not the observer's. This is crucial when a coach is facing a group of athletes.¹⁶

2.3 The Muscular System: Scientific vs. Common Names

A duality exists in sports English between the medical terms used in injury reports and the colloquial terms used in coaching. A competent professional must be bilingual in this sense, switching registers depending on the audience.¹⁹

1. **The Pectoralis Major ("Pecs"):** Located on the anterior chest. Responsible for shoulder flexion and horizontal adduction.
 - *Coaching Cue:* "Stick your chest out."
 - *Medical Context:* "Strain of the pectoralis tendon."¹⁹
2. **The Deltoids ("Delts"):** The triangular muscles of the shoulder. Divided into anterior, medial, and posterior fibers.
 - *Function:* Arm abduction (lifting arm to side).
3. **The Latissimus Dorsi ("Lats"):** The broad back muscles.
 - *Function:* Pulling movements (e.g., chin-ups).
4. **The Rectus Abdominis ("Abs"):** The "six-pack" muscle.
 - *Function:* Trunk flexion.
5. **The Quadriceps Femoris ("Quads"):** A group of four muscles on the anterior thigh (Rectus femoris, Vastus lateralis, Vastus medialis, Vastus intermedius).
 - *Function:* Knee extension (kicking, jumping).¹⁹
6. **The Hamstrings ("Hams"):** Posterior thigh muscles.
 - *Function:* Knee flexion and hip extension.
7. **The Gastrocnemius and Soleus ("Calves"):** Posterior lower leg.
 - *Function:* Plantarflexion (standing on tiptoes).

Mechanism of Action:

It is vital to teach the concept of Antagonistic Pairs. Muscles can only pull (contract); they cannot push. Therefore, movement requires a prime mover (agonist) and an opposing muscle (antagonist).

- *Example:* In a bicep curl, the **Biceps Brachii** is the agonist (contracting), and the **Triceps Brachii** is the antagonist (relaxing/lengthening).²¹ Describing this relationship is a common task in academic exams.

2.4 Planes of Motion

To describe complex athletic movements, we utilize the three planes of motion. This concept is essential for biomechanical analysis.¹⁸

- **Sagittal Plane:** Divides the body into left and right halves. Movements here are forward and backward.
 - *Examples:* Running, Somersaults, Bicep Curls.
 - *Primary Movements:* Flexion and Extension.¹⁸
 - **Frontal (Coronal) Plane:** Divides the body into front and back halves. Movements here are side-to-side.
 - *Examples:* Jumping Jacks (Star Jumps), Lateral Lunges.
 - *Primary Movements:* Abduction and Adduction.
 - **Transverse Plane:** Divides the body into top and bottom halves. Movements here involve rotation.
 - *Examples:* Golf swing, swinging a bat, pirouette.
 - *Primary Movements:* Rotation, Pronation, Supination.
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