

Shyamal Mazumder

W.B.E.S. (Asstt. Prof.), M.P.E.; M.Phil.;  
Ph.D.; Dip. in Coaching (F.B.)

LESSON NO: 5

SKELETAL MUSCLES

Study of skeletal muscles helps to understand the structure, functions, classifications and muscle exercise, specially during writing coaching lesson, specific lesson and understanding mechanical principles of walking, running, jumping, throwing and other skills and techniques of sport activities.

1. Structure of skeletal muscles
2. Functions of skeletal muscles.
3. Classification of skeletal muscles.
4. Muscle Exercise

### **3.0 STRUCTURE OF SKELETAL MUSCLES**

Skeletal muscles are organs, which made up of skeletal muscle tissue plus important connective and nervous tissue components. Skeletal muscles differ in size, shape and arrangement of fibers. They range from very small strands such as muscle of middle ear to large masses such as the muscle of the thigh. Some skeletal muscles are narrow in shape and some broad. Some are long, some short and blunt. Some are triangular and some are irregular. Some form flat sheets and others bulky masses.

Arrangement of fibers differs in various muscles. In some muscles the fibers are parallel to the long axis of the muscle, in some they have narrow attachment. The direction of the fibers making a muscle is important because of its relationship to function.

### **4.0 FUNCTION OF SKELETAL MUSCLES**

1. Skeletal muscles contract only if stimulated. The natural stimulus in nerve impulses and artificial stimuli are electrical or injury.

2. Skeletal muscles contract in different types such as isotonic contraction, isometric contraction, twitch contraction etc.
3. Skeletal muscles contract according to graded strength.
4. Skeletal muscles produce movement by pulling on end bones of joints.
5. Muscles, which move part, do not be over that part but go close to it.
6. Skeletal muscles always act in groups rather than singly.
7. Bone act as levers and joints as fulcrums of these levers.

## 5.0 CLASSIFICATION OF SKELETAL MUSCLES

The following is the classification of skeletal muscles according to some of the body parts:

1. **Upper Arm** - The major muscles that move upper arm are;
  - (1) Pectoralis major
  - (2) Latissimus dorsi
  - (3) Deltoid
2. **Lower Arm** - The main muscles that move lower arm are;
  - (1) Biceps
  - (2) Triceps
  - (3) Brachialis
3. **Leg Thigh** - The major muscles that move the thigh are;
  - (1) Gluteus maximus
  - (2) Iliopsoas
  - (3) Rectus femoris
  - (4) Adductor longus
4. **Lower Leg**
  - (1) Quadriceps femoris
  - (2) Hamstring muscles
  - (3) Sartorius
5. **Foot** - The main muscles that moves the foot are;
  - (1) Tibialis anterior
  - (2) Gastrocnemius
  - (3) Soleus
6. **Head** - The muscles which move the head are;
  - (1) Sternocleidmastoid
  - (2) Splenius Capitis
  - (3) Longissimus capitis
7. **Chest** - The main muscles that move the chest wall are;
  - (1) External intercostals
  - (2) Internal Inter Costals
  - (3) Diaphragm
8. **Shoulder** - The muscles which move the shoulder are;
  - (1) Trapezius
  - (2) Pectoralis
  - (3) Serratus anterior

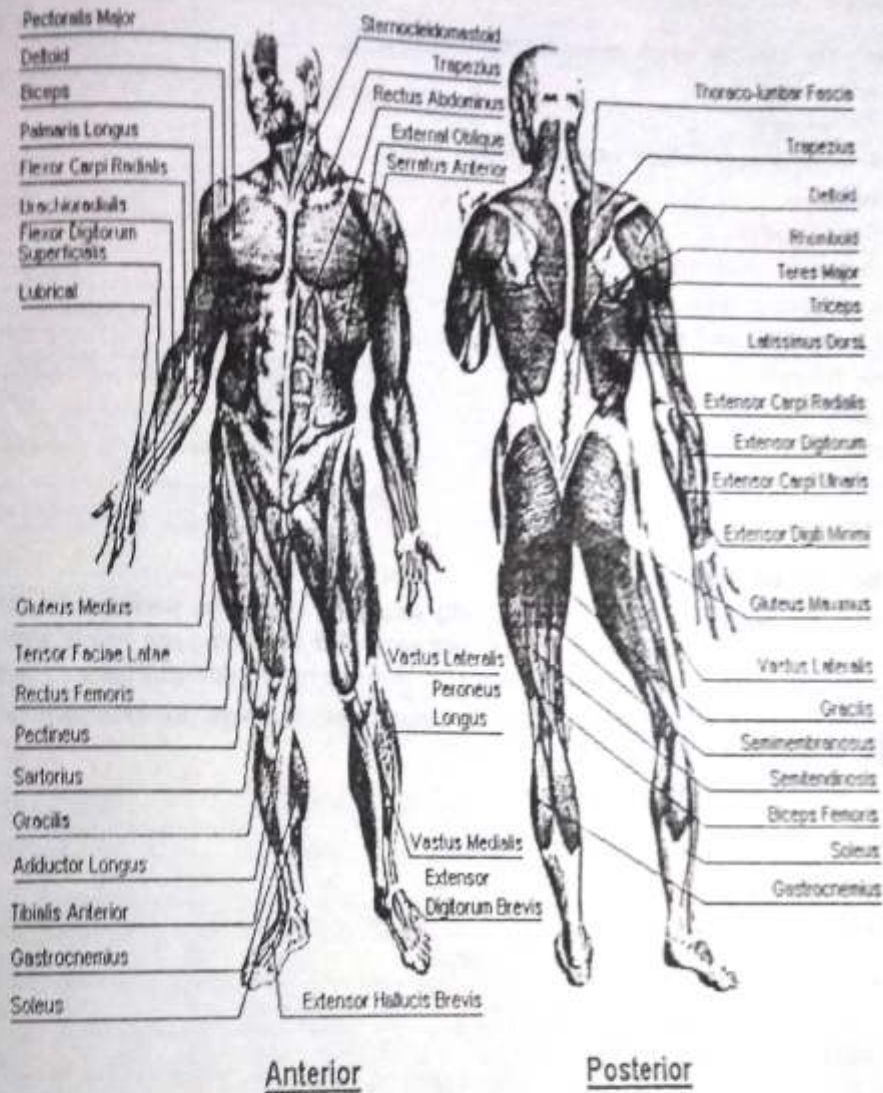


Fig. 2. Muscles Chart

9. **Hand** - The muscles which move the hand are;
- (1) Palmaris longus
  - (2) Flexor Carpi Radialis
  - (3) Flexor carpi ulnaris
  - (4) Extensor Carpi Radialis Longus
  - (5) Extensor carpi radialis brevis
10. **Abdominal Wall** - The muscles which move the abdominal wall are;
- (1) External oblique
  - (2) Internal oblique
  - (3) Transversalis
  - (4) Rectus abdominis

11. **Pelvic** - The muscles which move the pelvic floor are;

- (1) levator ani
- (2) coccygeus

12. **Trunk** - The muscles which move the trunk are;

- (1) Iliopsoas
- (2) Sacrospinalis
- (3) Iliopsoalis lumborum
- (4) Longissimus dorsi

13. **Facial expression and mastication-**

- (1) Occipito frontalis
- (2) Orbicularis oculi
- (3) Orbicularis oris
- (4) Masseter
- (5) Temporal

## 6.0 MUSCLE EXERCISE

Prior to strength training, warm up and flexibility exercises should be performed. Warm up should include at least 5 minutes of aerobic activity to provide increased blood oxygen levels and increased body temperature. Both of these factors will increase the effectiveness of the strength-training workout.

Exercise sessions should be organized so that the larger muscle groups are exercised first, followed by the smaller muscle groups.

The order of groups should be as follows:

- Abdomen
- Hips and lower back
- Upper Legs
- Calves
- Chest
- Upper back
- Shoulders
- Triceps
- Biceps
- Waist
- Neck

(A) Chest Exercises	Muscle Group
Bench Press	Pectorals, Triceps, Anterior Deltoids
Inclined Fly	Outer/Inner Pectorals, Anterior Deltoids
Inclined Press	Upper Pectorals, Triceps, Anterior/Medial Deltoids
Declined Press	Lower/Outer Pectorals, Triceps, Anterior Deltoids Pectorals
Pushup	Triceps, Anterior Deltoids
Cable Crossover	Upper/Lower Pectorals
Pec Dec	Pectorals, Anterior Deltoids

<b>(B) Back Exercises</b>	<b>Muscle Groups</b>
Shrugs	Trapezius
One Arm Row	Trapezius, Latissimus Dorsi
Pull-ups	Biceps, Rhomboids
Back Extension	Erector Spinae
Roman Bench	Erector Spinae
Seated Row	Erector Spinae, Latissimus Dorsi, Biceps
Lateral Pull down	Latissimus Dorsi, Biceps
<b>(C) Shoulder Exercises</b>	<b>Muscle Groups</b>
Overhead (Military) Press	Medial Deltoid, Triceps
Lateral Raises	Anterior/Medial Deltoid
Front Raises	Anterior/Posterior Deltoid
Prone Fly	Posterior Deltoid, Rhomboids
<b>(D) Arm Exercises</b>	<b>Muscle Groups</b>
Barbell Curl	Full Biceps/Forearms
Dumbbell Preacher Curl	Upper/Outer Biceps
Standing Dumbbell/Low Cable	Inner Biceps
Seated Hammer Curls	Outer Biceps/Forearms (Brachialis)
Seated Inclined Dumbbell Curls	Lower Biceps
Triceps Kickback/Dip	Triceps Lateral Head
Triceps Seated OverHead Ext	Triceps Medial Head
Triceps Lying Extension	Triceps Long Head
<b>(E) Lower Body</b>	<b>Muscle Groups</b>
Squat	Gluteus Maximus, Quads, Hamstrings, Erectors
Front Lunge	Gluteus Maximus, Quads, Hamstrings
Calf Heel Raise	Gastrocnemius, Soleus
Hip Extension	Gluteus Maximus
Hip Abduction	Abductors, Outer Thigh
Hip Adduction	Adductor, Inner Thigh
Leg Press	Gluteus Maximus, Quads, Hamstrings
Leg Extension	Quads
Leg Curl	Hamstrings
<b>(F) Abdominal</b>	<b>Muscle Groups</b>
Upper Crunches/Inclined	Upper Abdomen
Sit-up	
Lower Crunches/Leg	Lower Abdomen
Raises	
Side Crunches	Outer Obliques
Crunch Machine	Abdomen, Hip Flexor

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Leg Press	Gluteus Maximus, Quads, Hamstrings
Leg Extension	Quads
Leg Curl	Hamstrings
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Lower Crunches/Leg Raises	Lower Abdomen
Side Crunches	Outer Obliques
Crunch Machine	Abdomen, Hip Flexor