Types of muscle tissue

Skeletal

cardiac

Smooth

Movement of thigh and Leg

- Grouped according to anterior, medial, or posterior
- Most anterior muscles flex femur at hip, extend leg at knee
- Most posterior muscles extend thigh, flex leg
- Medial muscles all adduct thigh
- All three groups enclosed by fascia late
- Include flexion, extension, abduction, adduction, circumduction, and rotation
- Thigh flexor pass in front of hip joint
- liposoas: primary mover of flexion
- Tensor fasciae latae
- Rectus femoris
- Assisted by medial adductors and sartorial Thigh extensor
- Hamstring muscles: prime movement of extension
- Quadricep femoris arise from four separate heads that form the flesh of front and side of thigh
- All insert into the quadricep tendon which then inserts into the patella, ad then via patellar ligament, into the livid tuberosity
- powerful knee extensor

Smooth Muscle

Smooth Muscle Tissue: Found in walls of hollow organs

not striated

Involuntary: cannot be controlled consciously

4 Main characteristics of Muscle Tissue

Excitability	Contractility	Extensibility	Elasticity
Ability to receive and respond to stimuli	Ability to shorten forcibly when stimulated	Ability to be stretched	Ability to recoil to resting length

Compression of abdominal viscera

Four paired muscles
- Rectus abdominis
- external obliques
- internal obliques
- transverse abdominis

Head Movement and Trunk Extension

Anterolateral neck muscles	Intrinsic Muscles of the back
Move head	extend trunk and maintain posture

Myofibrils

Myofibrils	myofibril features
densely packed, rodlike elements	Striation
80% of muscle cell volume	sarcomas
	Myofilaments
	molecular composition of muofilaments

Sliding filament Model of Contraction

Contraction	Sliding filament model of contraction

Sliding filament Model of Contraction (cont)

the activation of cross bridges to generate force	During contraction, thin filaments slid past thick filaments, causing actin and myosin to overlap more
shortening occurs when tension generated by cross bridges on thin filaments exceed forces opposing shortening	When nervous system stimulates muscle fiber, myosin heads are allowed to bind to action forming cross bridges

contraction ends when bridge become inactive

Mastication ad tongue movement

Muscle of mastication

four pairs all innervated by cranial nerve V

prime mover of jaw closure: tempralis and master

grinding movement; pterygoids

chewing role: buccinator

Fascicle Arrangements (cont.)

pennate	different forms
short fascicles attach obliquely to central tendon running length of muscle	Unipennate: fascicles attach only to one side of tendon
	Bipennte: fascicles insert from opposite sides of tendon (rectus femurs)
	Multipennate: appears as feathers inserting into one tendon (example deltoid)

Movement of Ankels and Toes

- Muscles of anterior compartment
- primary toe extensors and ankle dorsli-fexors
- Tibialis anterior
- Extensor digitorum longus
- Fibuaris tertius
- Extensor hallucis longus

Muscles of the lateral compartment of the leg

- Plantar flexion and eversion of the foot; stabile lateral ankle and lateral longitudinal arch of foot
- Fibularis longus
- Fibularis brevis

Muscles of the posterior compartment f the leg

- act to plantar flex the ankle
- All are innervated by tibial nerve
- Divided into Superficial muscles and deep muscles

Humerus Movement

- nine Muscles cross shoulder ring
- Insert on and move humerus
- Some originate from scapula, other from axial skeletion

-action include flexion, extension, adduction

- Three prime movers of arm

1) pectorals major
2) latissimus dorsi
3) Deltoid

- Rotator cuff muscles act as synergist and fixators;originate on scapulae reinforce shoulder capsule; prevent dislocation

1) supraspinatus
2) infraspinatus
3) teres minor
4) subscapularis

Swallowing Muscles

Sternocleidomastodi muscle divides neck into two triangles

- Anterior muscles are divided based on location to the hyoid bone: supra hyoid and infra hyoid
- Tongue and buccinator muscles push food back towards pharynx, where muscles in posterior mouth and pharynx complete swallowing process
- Epiglottis closes over larynx while muscles in walls of pharynx propel food forward to stomach
-

Facial Expressions

Facial expression muscles are different because they insert into skin not bone	Facial expression muscles consists of two groups
Important nonverbal communication	Muscles of the scalp
	muscles of the face

Muscle Action and Interaction

muscle can only pull; never push	3 main function group
what one muscle group does the other undoes	Prime mover: major responsibility for producing specific movement
	Antagonist: opposes or reverses particular movement

Muscle Action and Interaction (cont)

Syngerist: Helps prime mover; adds extra force to same movement; reduces undesi-rable or unnecessary movement; Fixator: type that immobilizes bone or muscle organ rather than enhancing movement of Prime movers

Myofibrils

Striations	sarcomere	myofil-aments
Stripes formed from repeating series of dark and light bands along length of each myofibril	Smallest contractile unit of muscle fiber	Actin myofil-aments: Thin filament; extend across I band and partway in A band
A band= dark region	Contains A band with half of an I band at each end	myosin Myofil-aments: Thick filaments: extend length of A band

I band= lighter region

Muscle Fiber Microanatomy

Sarcolemma	Sarcoplasma
muscle fiber plasma membrane	muscle fiber cytoplasm

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Muscle Functions

Produce movement	Maintain posture and body position	Stabilize joints	Generate heat as the contract
Responsible for all locomotion and manipulation			

Skeletal Muscle

Skeletal muscle tissue	Skeletal muscle fibers
packaged into skeletal muscles: organs that are attached to bone and skin	Longest of all muscle and have striations (stripes)
	also called voluntary muscle: can be consciously controlled

Fascicle Arrangements

All skeletal muscle consists of bundles of fibers	The most common patterns of arrangement
Variation results i muscles with different shapes and functional capabilities	Circular: fascicles arranged in concentric rings
	Convergent: broad organ; fascicles converged toward single tendon insertion
	parallel: Fascicles parallel to long axis of traplike muscle (striation)
	Fusiform: Spindle shaped muscle with parallel fibers (bicep brachia)

Swallowing Muscles (Cont)

Infrahyoid Muscles	Suprahyoid Muscles
- four strap like muscles	Four deep muscles involved in swallowing
Depressed hyoid bone and larynx during swallowing and speaking	1) Form floor or oral cavity 2) Anchor tongue 3) Elevated hyoid bone 4) Move larynx during swallowing

Breathing

Inhailing	Expiration
contraction of the muscles enlarge the rib cage	Relaxation of muscles decrease size of rib cage
Diaphram divides thoracic and abdominal cavities	

Skeletal Muscle Anatomy

Nerve and blood Supply	Connective tissue sheaths	Attachments
each muscle receives a nerve, artery, and veins	Muscles covered in connective tissue	muscle span joints and attach to bone
consciously controlled skeletal muscles has nerves supplying every fiber to control activity	Support cells and reinforces whole muscles	Muscles attach to bone in two places Insertion: Attachment to movable bone: Orgion: attachment to oimmovable bone

Skeletal Muscle Anatomy (cont)

Contracting muscles fivers require huge amounts of oxygen and nutrients	Epimysium: Dense irregular connective tissue surrounding entire muscle; may blend with fascia	Direct Attachment: Epimysium fused to periosteum of bone or perichondrium of cartilage
need waste products removed quickly	Perimysium: Fibrous connective tissue surrounding fascicles	Indirect: Connective tissue wrapping extend beyond muscle as roselike tendon or sheetlike aponeurosis
	Endomysium: Fine areolar connective tissue surrounding each muscle fiber	

Scapula and arm

- Most are the extrinsic shoulder muscles
- act in combination to fit shoulder girls; Move it to increase range of arm movements
- action: elevation, depression, rotation, lateral and medial movements, protraction and retraction

Two groups of muscle

- Muscle of the anterior thorax
- muscles of the posterior thorax

Movement of Wrist, Hand, and Fingers

- Divide into anterior and posterior muscles
- Most anterior muscles are flexors
- Most posterior muscles are extensors
- further divided into superficial and deep muscles
- Action: Movement of wrist, finger, thumb, as well as pronation and supination of forearm
- Pronator teres and pronator quadratus pronate forearm
- Supination: synergist with biceps brachia in forearm supination

Anterior Muscles

- Consist of five superficial and three deep muscles
- Most arise from common flexor tendon attached to medial epicondyle of humerus
- Most tendons of insertion held in lace at wrist be flexor retinaculum

Posterior Muscles

- consists of four superficial and four deep muscles
- All are innervated by the radial nerve or its branches
- Most arise from common flexor tendon attached to lateral epicondyle of humerus
- Most tendons of insertion help in lace at wrist by extensor retinaculum

Cardiac Muscle

Cardiac muscle tissue: is found only in heart

makes up bulk of heart walls; striated

involuntary; cannot be controlled consci-ously