Layers of the skin

Epidermis
- ✗
- ✗
- ✗
- ✗
- ✗

Dermis
- ✗
- ✗

Hypodermis

Layers of the skin

Epidermis
- Statum Basles
- Stratum spinous
- Statum granulosm
- Stratum lucidum
- Strutum corneaum

Dermis
- pappillar(1.5th)
- reticular (4/5th)

Hypodermis

Receptors

Somatic pain -
Visceral Pain -
Referred pain -

Pacinian corpuscles –
Ruffini's corpuscles –
Meissners corpuscles –
Merkel's disc –
Thermoreceptors –
Nociceptors –

Receptors

Pain in the skin, muscles, bones, joints, etc is called – somatic pain
Any pain from the organs is called - visceral
Visceral pain is often not "felt" in or over the organ or location from which it originates, but rather somewhere else. This is called – referred pain

Pacinian corpuscles – detect vibration
Ruffini's corpuscles – detect pressure
Meissners corpuscles – light touch
Merkel's disc – touch and pressure (in epidermis – act like a real nerve ending)
Thermoreceptors – temperature
Nociceptors – (Pain receptors) free nerve endings that are interpreted by the brain whoever the brain wants to interpret them.

Muscles

Voluntary myo -
Involuntary myo -

Cardiac myo -

Fiber –

Motor end-plate –

Neuronmusclar junction –

neurotransmitter -

Muscles

Voluntary myo. (AKA striated / aka skeletal) makes up the largest percentage of body mass. Envervated by voluntary nerves. Striated because it has stripes.

Involuntary myo (aka smooth, aka visceral) – its the muscles inside the organs and blood vessels. Under control of he autonomic nerve system. You don't see the striations under light microscopes.

Cardiac myo (a cross between smooth and striated) has some striations. Has slightly different physiology functions.

Fiber – nerve cells, connective tissue, muscle tissue all can be called fibers.

Motor end-plate – The end of the nerve that is stimulating the muscle. It's still a synapse. It will stimulate either a few or a couple of hundred. (for large muscles, it's several hundred, the more precise it has to be, the fewer muscles cells are stimulated.)

Neuronmusclar junction – It's a synapse, but it's nerve to muscle. The receptors in the muscle and the motor end-plate.

Sometimes the neurotransmitter is reused. However, in skeletal muscles, the neurotransmitter is degraded. There are diseases where you can't create enough neurotransmitter...

Terminology

Sarcolemma –
T-tubules –
Sarcoplasm –
Sarcoplasmic reticulum –
Nucleus –
Sarcomere –
Z Disc –
Actin –
Myosin Filament –
Cross-bridges –
Tropomyosin –
Troponin –
Rigor mortis –

Terminology

Sarcolemma – muscle cell outer membrane
T-tubules – tubular extensions from the sarcolemma that carries depolarization to the cell's interior.
Sarcoplasm – muscle cell cytoplasm.
Sarcoplasmic reticulum – An endoplasmic reticulum like bag that contains calcium ions.
Nucleus – Skeletal muscles cells have multiple nuclei
Sarcomere – The collapsing "room"
Z Disc – The two outer walls of the sarcomere.
Actin – Muscle protein attached to the Z disc
Myosin Filament – (the non-moving part) attaches to and moves the actin
Cross-bridges – the actual portion of the myosin filament that attaches to the actin.
(Note: there can be 6 strands of actin around the myosin.
Tropomyosin – in the relaxed muscle, it covers the binding site on the actin.
Troponin – holds the tropomyosin in place.
Rigor mortis – within a period of time (a couple of hours at room temperature) a dead body stiffens (and will stay stiff for about 24 hours)

More terminology

Z-line –
A band –
H band –
M line –
I band –
Motor Unit –
All or nothing rule -
Muscle tone –
Aerobic metabolism and pyruvic acid –
Anaerobic metabolism and lactic acid –
Oxygen Debt –

More Terminology

Z-line – where the Z-disc is.
A band – The total length of the myocin.
H band – The inner par of he A band where there is no overlapping actin.
M line – dead center of the sarcomere. The connection that holds the myosin in place.
I band – the area around the z-disc where all you have is actin.
Motor Unit – the one nerve fiber and all of the muscle cells it stimulates
All or nothing rule - A muscle cell will contract completely or not at all.
Muscle tone – refers to the fact that all muscles at all time will have some degree of contraction. (The normal state of the muscle.)
Aerobic metabolism and pyruvic acid – burning fuel in the presence of oxygen. It produces pyruvic acid which goes into the citric acid cycle.
Anaerobic metabolism and lactic acid – burning fuel without oxygen. It produces lactic acid.
Oxygen Debt – the amount of oxygen needed to turn the lactic acid back into pyruvic acid.

Cardiac Muscles

Skeletal muscle vs . cardiac muscle:
Interconnected -
Intercalated disks –
Blood supply to the heart muscles and mitochondira in heart muscles –
Cardiac muscle contractions –
Cardiac muscle does not have the capability-

Cardiac Muscles

Skeletal muscle is multinucleated, cardiac muscle has only one nucleus.

Cardiac cells are interconnected so that only one muscle fiber/cell needs to be depolarized in order to depolarize all of the cardiac muscle cells.

Intercalated disks – a synapse(or actual connect) between cardiac cells that allows the depolarization to travel from one cell to the next.

Blood supply to the heart muscles and mitochondira in heart muscles – has a much greater blood supply and many more mitochondria in the cells.

Cardiac muscle contractions – are slower and last longer than skeletal muscle contractions.

Cardiac muscle does not have the capability to work under anaerobic conditions.

Smooth Muscle

Number of Nucleus:
Intermediate filament bundles –
Dense Bodies –
Visceral -
Multiunit smooth muscle consists of –

Smooth Muscle

Smooth muscles have only one nucleus.
Intermediate filament bundles – like the actin and the myosin, the equivalent of the Z-line.
Dense Bodies – what the intermediate filaments pull on.
Visceral - single unit smooth muscle forms a continuous interconnected network of muscle fibers that function as a single unit.
Multiunit smooth muscle consists of – individual muscle fibers where each muscle fiber is controlled by a separate motor neuron.

Bones

Epiphyseal plate –

Epiphyseal line –
Bone strength and activity -
Osteoblasts -
Osteaclasts –
Enchondral bone formation –
centers of ossification –
epiphyseal plate and line in long bones -
Enchondral –
Intramembranous bone formation –
Soft spots in the head –
Propriorecepion -
Golgi tendon organ -
Muscle spindles -

Bones

Epiphyseal plate – growth cartiledge

Epiphyseal line – when everything has turned to bone. It's not growing anymore.
Bone strength and activity - it has been proven that, if you are active your bones stay stronger.
Osteoblasts - a bone cell that makes bone
Osteaclasts – a bone cell the reabsorbs bone
Enchondral bone formation – it starts as membraneous to cartiledge and then to bone. Most of the areas of the body.
centers of ossification – place in the cartilage that starts to turn into bone (start in shaft in long bone and hen the two ends)
epiphyseal plate and line in long bones - the plate is the area of growth between the shaft of the bone and the epiphysis of the bone (where the bone grows in length).
Enchondral – found in most of the bones
Intramembranous bone formation – to allow bones to bend during birth. Found in skull, clavicle, and hips.
Soft spots in the head – fontanels, the areas where the bone is still membrane.
Propriorecepion - the feedback of where the body “is”.
Golgi tendon organ - tells the body how much stress is being put on the tendon. (this is what you hit when you hit someone to get the reflex reaction...)
Muscle spindles - tells how long the muscle has been stretched out, and the rate of the stretching.

Respiratory System

Respiratory passages -
upper –
lower –
ventilation –
Gas exchange –
Panes of glass analogy –
Surfactant –
Intrapulmonary pressure –
Intralpleural pressure -
Why is this important? .
We breathe in by –
Exhaling-
Compliance –

Respiratory System

Respiratory passages -
upper – from the larynx up
lower – trachea, bronchi, bronchioles
ventilation – the movement of air through the respiratory passages.
Gas exchange – the actual movement of oxygen in and CO2 out between the alveoli and the capillaries/blood.
Panes of glass analogy – put a drop of water between two planes of glass and they will stick together. Water itself is sticky. It will keep the alveoli from opening up.
Surfactant – substance that reduces the surface tension of water molecules in the alveoli and allows them to expand fully. (CF – surfactant is never developed)
Intrapulmonary pressure – pressure inside the lungs.
Intralpleural pressure - pressure inside the pleural sac.
Why is this important? Pleural space around the lungs has less than atmospheric pressure so they keep the lungs from collapsing.
We breathe in by – contracting the diaphragm
Exhaling- is totally passive. We relax and the air leaves...
Compliance – we relax and the lung cavity returns to it's normal size.