COMPARISON OF DIFFERENT TYPES OF MUSCLE PHYSIOLOGY

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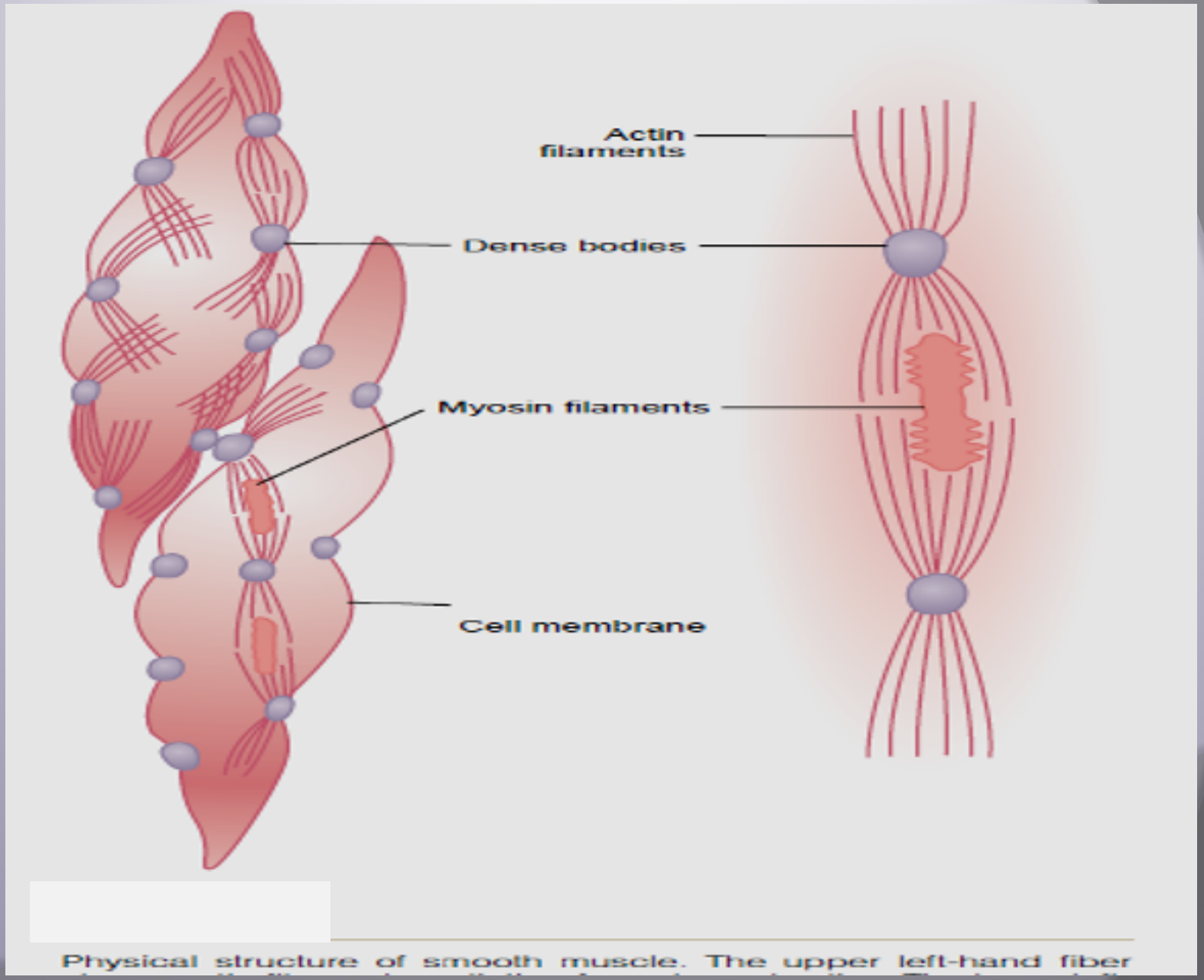
The Muscle

Muscles are divided into 3 types:

	Skeletal	Cardiac	Smooth
-Striations	Striated	Striated	Non-striated
-control	Voluntary	Involuntary	Involuntary
-innervation	Somatic	Autonomic N.S.	Autonomic N.S.
-Function	Movement	Pumping of blood	According to site
-site	Attached to bone	Heart	Gut, bl.vs, others

- -in the cardiac muscle and skeletal muscle there are some proteins are not found in smooth muscles
- -these proteins are troponin
- -in smooth muscle we have clmodiolin instead of troponin
- -troponin attached with 2 Ca by its C type
- -calmodiolin attached with 4 Ca

- -The function of the right side of the heart is to receive and collect blood only
- -The function of left side of the heart is pumping of the blood
- -smooth muscle are not straited because it haven’t lines , but it have dense bodies
- -the density of myosin in smooth muscle less than it in skeletal muscle.



Physical structure of smooth muscle. The upper left-hand fiber

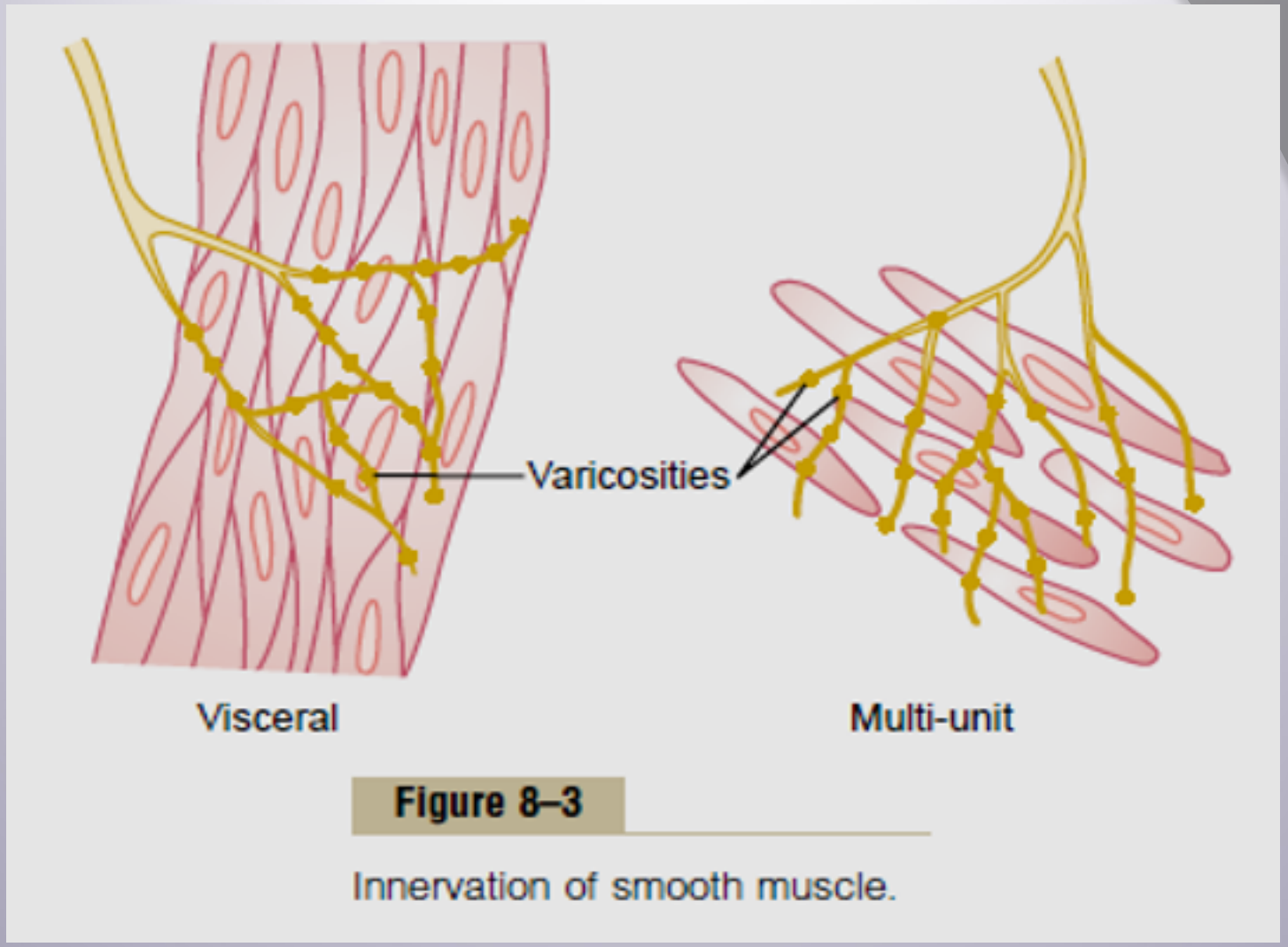


Figure 8–3

Innervation of smooth muscle.

Iris of these eye known as example of multi-unit

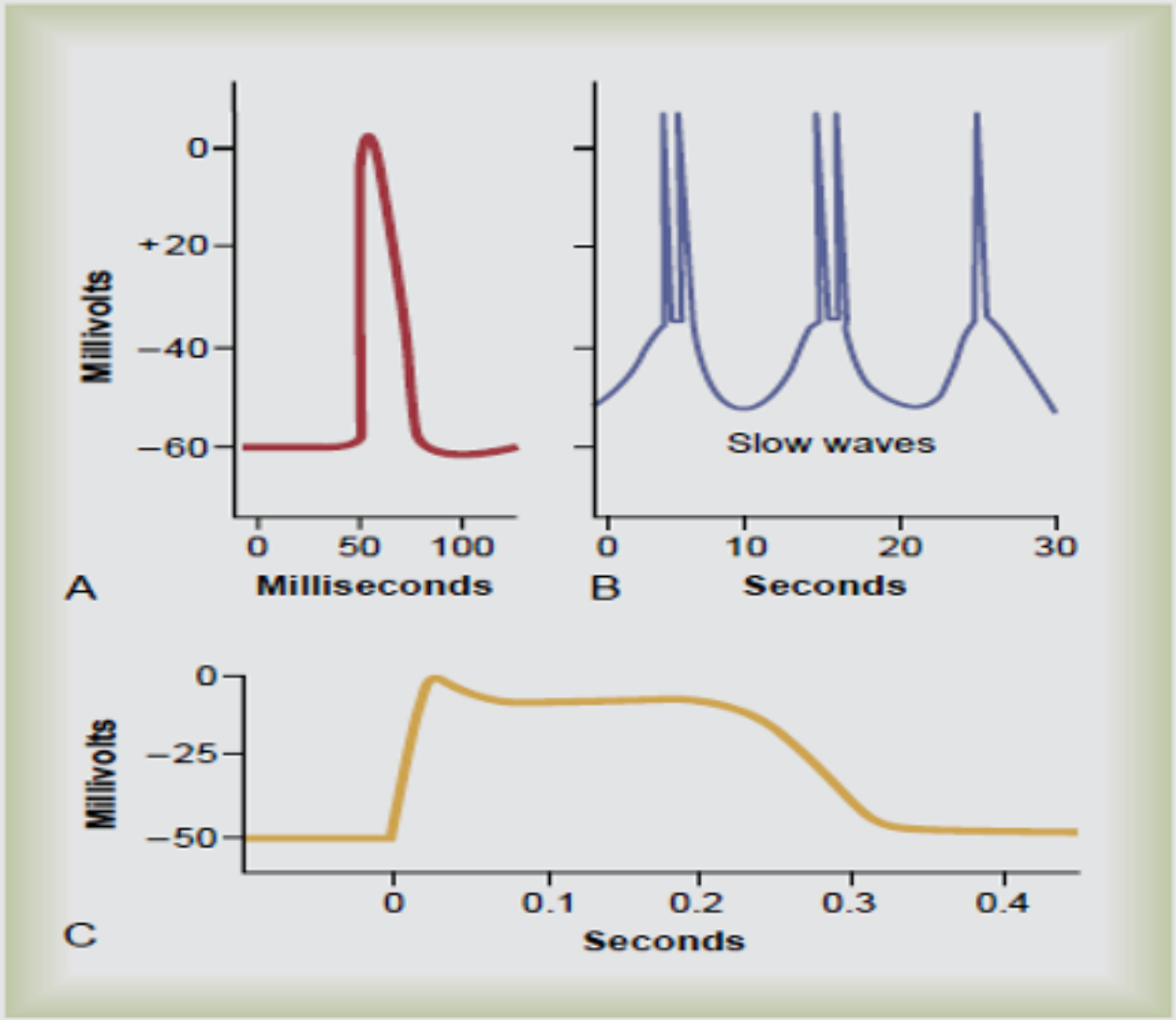
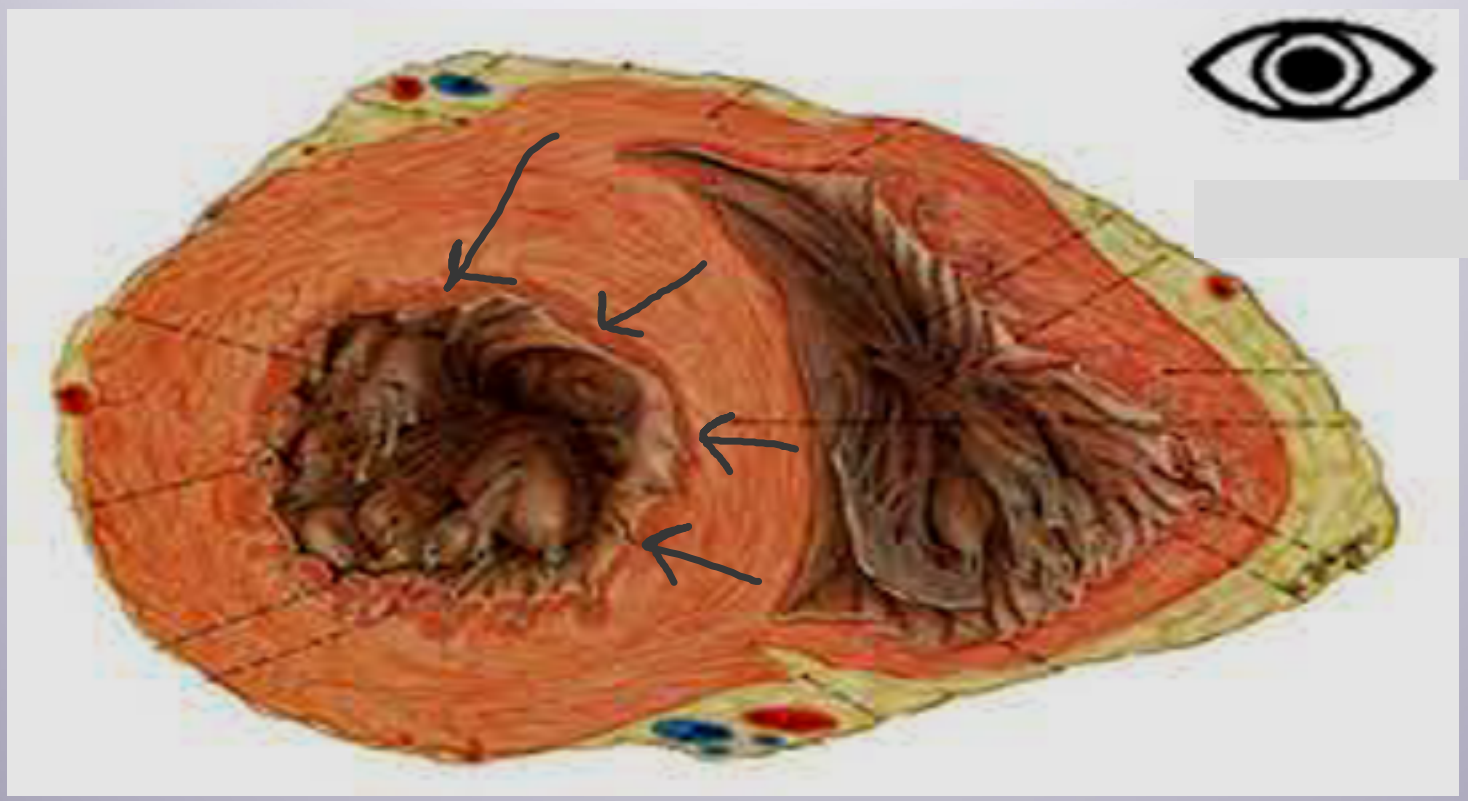


Figure 8–4

A, Typical smooth muscle action potential (spike potential) elicited

Left ventricular aid



The thickness of the left ventricle is 3 times that in right ventricle

- When the left ventricle contract its help right ventricle to contract also ..... This known as left ventricle aid.

Cardiac Muscle fibers

***The main tissues of the heart:**

1. **The connective tissues:** represent the septa of the heart and the fibrous valves in addition to its chordae tendinae fibrous tendons by which the papillary muscles attached to the vanes of the atrio-ventricular valve (AV valve).

2. **The muscular tissues:**

The atrial muscles: are thin and arranged in rings around both atria. The right atrial wall is thinner than the left atrial wall.

The ventricular muscles: formed of three layers:

- **The outer and inner layer**, are spiral, run in opposite directions. They loop back inside the heart to form the papillary muscles.
- **The middle layer** : is thick and transverse layer. It is lost at the apex.

N.B.: left ventricular aid:

The wall of the left ventricle is three times as thick as the right and the cross section the left ventricle is spherical and the right ventricle is oblong. So, the contraction of the left ventricle pulls on the outer free wall of the right ventricle, aiding its contraction (So, acute diseases that affect contraction of the right ventricle are not fatal as it can be compensated by the left ventricular aid).

The specialized cardiac muscles for initiation and propagation of excitation waves. They are modified cardiac muscle fibers which have the ability to conduct the nerve impulses throughout the myocardium and contract only feebly because they contain less myofibrils but more glycogen.

- -The papillary muscle is a thick muscle found in ventricles only ..... this source is inner and outer layers of ventricular muscles.
- - one of the modified tissues in the heart is pacemaker.
- -pacemaker is tissue modified from muscle and work to make heartbeat .

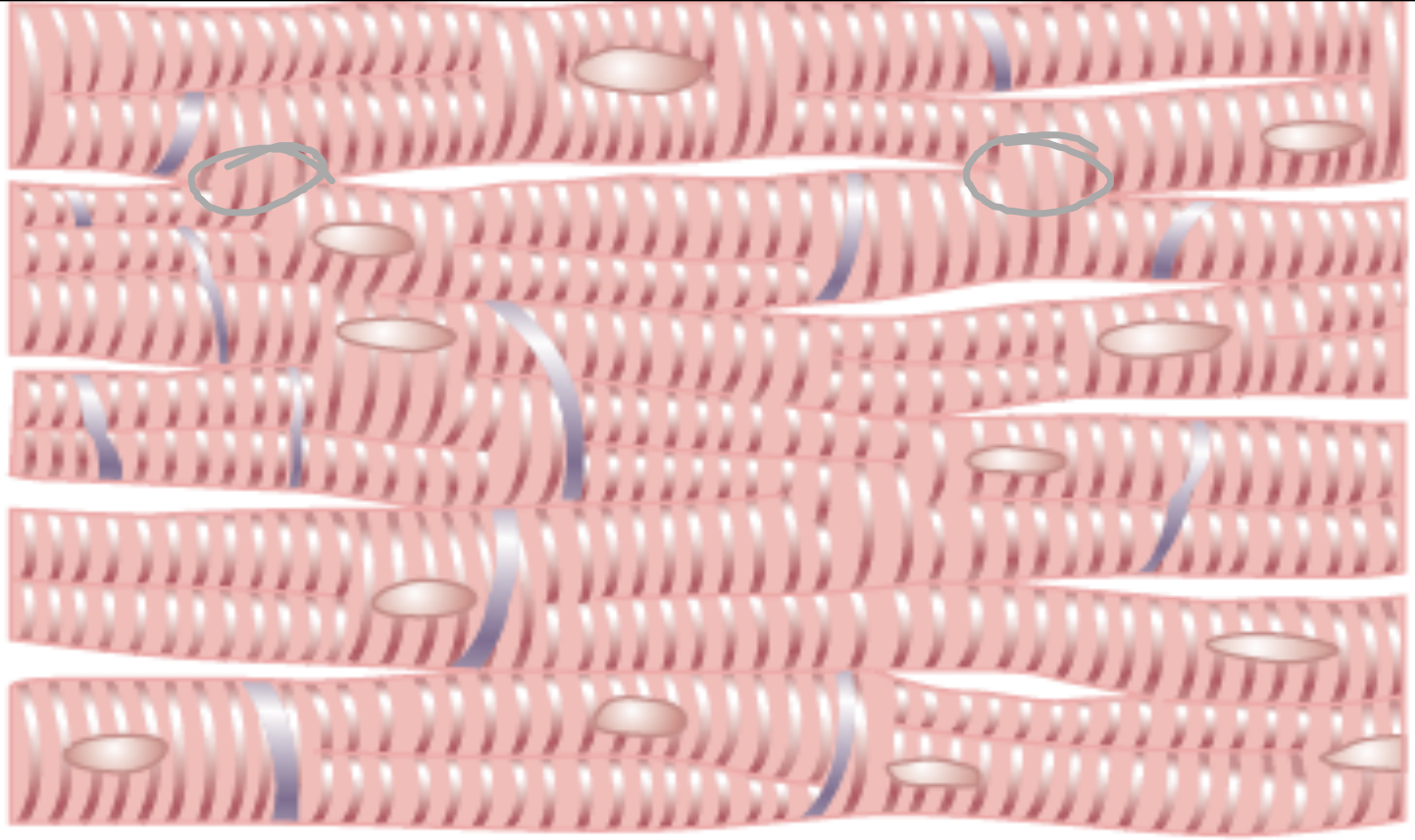


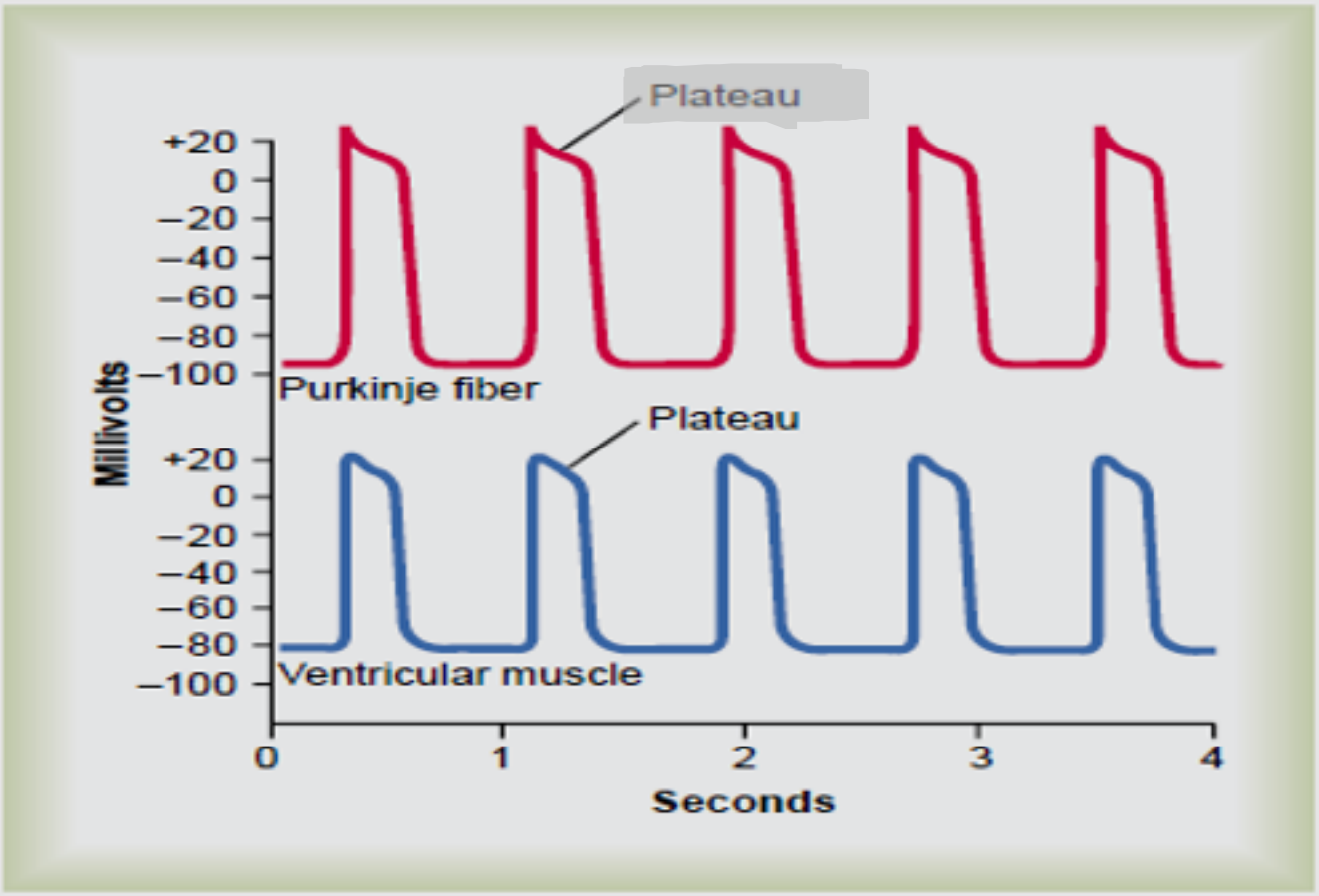
Figure 9–2

"Syncytial," interconnecting nature of cardiac muscle fibers.

Syncytium :Work as one part or one cell

- The cardiac muscle fibres are connected together by discs .....
- So it is work togother as one part and this known as syncytium
- Parkinje is modified

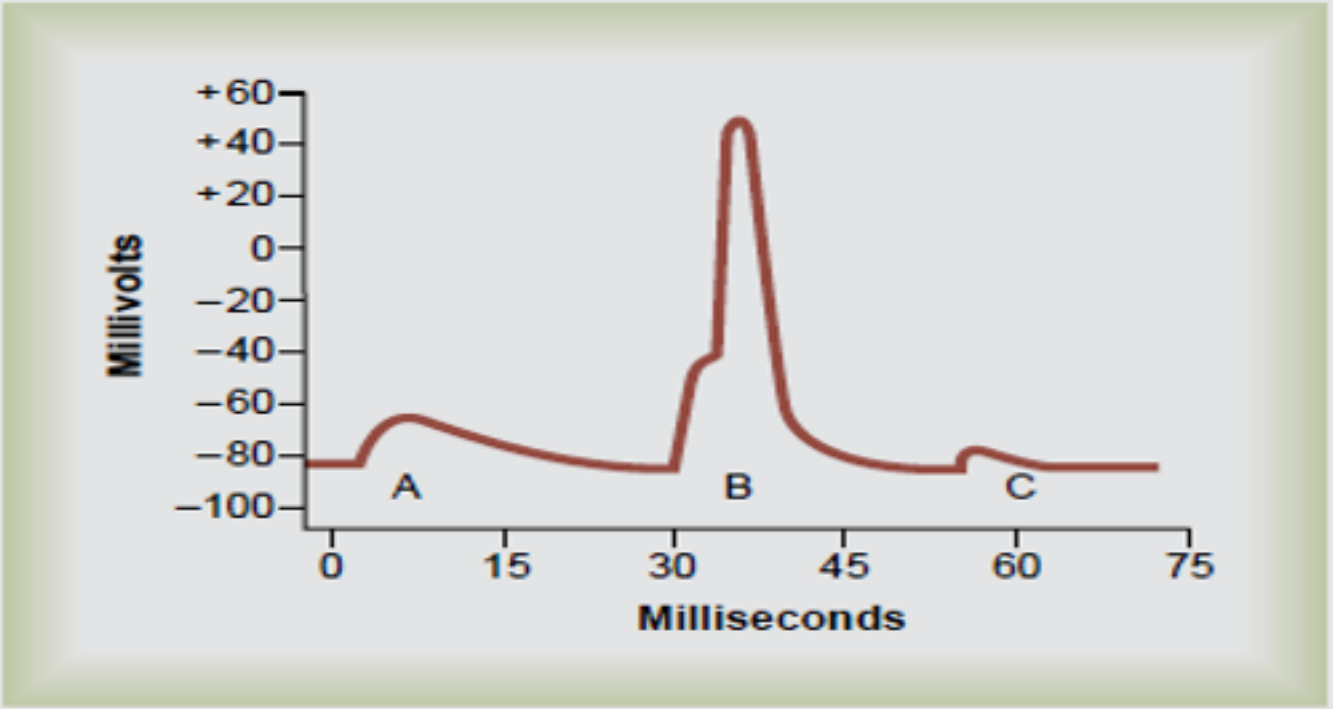
Cardiac Muscl fibers Action potential



Rhythmical action potentials (in millivolts) from a Purkinje fiber and from a ventricular muscle fiber, recorded by means of microelectrodes.

- -parkinje is modified
- -plateau : it is a new gate open that indicate slow Ca+ channel an Na+ channel influx that obstruct repolarization ..... K+ outflux balance or neutralize this Ca & Na influx.
- -plateu aren‘t found ind skeletal muscle.

Skeletal muscle EPP



End plate potentials (in millivolts). *A*, Weakened end plate potential recorded in a curarized muscle, too weak to elicit an action potential. *B*, Normal end plate potential eliciting a muscle action potential. *C*, Weakened end plate potential caused by botulinum toxin that decreases end plate release of acetylcholine, again too weak to elicit a muscle action potential.

Thank You