QUIZ Time

physiology 7

Done&Corrected by:Mohammed Ramadan

لجنة طب الأسنان

physiology 7

What happens during depolarization of the action potential?
a) Fast voltage-gated Na+ channels open
b) K+ channels close immediately
c) Na+ channels remain closed
d) Cl- enters the cell

Ans: b

What is the role of the Na+-K+ pump in maintaining RMP?
a) It pumps 2 Na+ in and 3 K+ out
b) It pumps 3 Na+ out and 2 K+ in
c) It allows Na+ and K+ to move freely
d) It does not affect RMP

Ans: b

What is the main cause of the resting membrane potential?
a) Equal distribution of Na+ and K+
b) Selective permeability of the membrane and Na+-K+ pump
c) High intracellular Na+ concentration
d) Low extracellular K+ concentration

Ans: b

What happens when the membrane reaches +35 mV during an action potential?
a) K+ channels close
b) Na+ channels close
c) More Na+ enters the cell
d) The membrane remains depolarized

Ans: b

physiology 7

Which of the following ions contributes to the negative charge inside the cell at rest?

a) Na+

b) Cl-

c) Protein anions and phosphate ions

d) Ca2+

Ans:c

What is the primary reason for the rapid phase of repolarization?

a) Opening of Na+ channels

b) Closing of K+ channels

c) Increased K+ outflow

d) Decreased K+ outflow

Ans:c

Why does K+ leak out of the cell more than Na+ leaks in at rest?

a) The concentration gradient of K+ is lower than that of Na+

b) The membrane is 50-100 times more permeable to K+ than Na+

c) Na+ channels are always open, while K+ channels are gated

d) The Na+-K+ pump transports more K+ out than Na+ in

Ans:b

What is the primary cause of the positive after potential (after hyperpolarization)?

a) Complete closure of Na+ channels

b) Slow closure of K+ channels

c) Increased Na+ influx

d) Decreased permeability of the membrane to K+

Ans:b

physiology 7

The resting membrane potential is more negative inside the cell than outside?

a) True

b) False

ans:a

Local anesthetics like lidocaine block K+ channels, preventing repolarization?

a) True

b) False

Ans:b

QUIZ Time

physiology 8

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physiology 8

What is the normal resting membrane potential of cardiac muscle?
a) -50 to -70 mV
b) -70 to -85 mV
c) -85 to -100 mV
d) -100 to -120 mV

Ans:c

Which phase of the cardiac action potential is responsible for preventing tetanic contraction?
a) Phase 0 – Depolarization
b) Phase 1 – Initial Repolarization
c) Phase 2 – Plateau Phase
d) Phase 3 – Final Repolarization

Ans:c

What is the effect of vagal tone on the SA node?
a) Increases the firing rate to 105 impulses/min
b) Decreases the firing rate to 70 impulses/min
c) Has no effect on heart rate
d) Stops SA node activity

Ans:b

What does Frank-Starling's Law state?
a) The heart contracts maximally or not at all
b) The force of contraction is proportional to initial muscle fiber length
c) The action potential duration determines contraction strength
d) The AV node determines the heart's contraction force

Ans:b

physiology 8

What is the function of intercalated discs in cardiac muscle?
a) They increase muscle contraction force
b) They allow electrical excitation to spread rapidly between cardiac cells
c) They store calcium for contraction
d) They prevent overstretching of cardiac fibers

Ans:b

What happens when the heart muscle is overstretched, as in heart failure?
a) The force of contraction increases indefinitely
b) The force of contraction decreases
c) The SA node stops functioning
d) The vagal tone increases heart rate

Ans:b

Which part of the heart has the highest rhythm and acts as the primary pacemaker?
a) (AV) node
b) atrial muscle
c) (SA) node
d) Ventricular muscle

Ans:c

The all-or-none rule states that cardiac muscle contracts partially depending on the stimulus strength?
a) True
b) False

Ans:b

physiology 8

The Na+-K+ pump plays a role in restoring the resting membrane potential after repolarization?
a) True
b) False

ans:a

Which of the following best explains the ionic basis of the plateau phase (Phase 2) of the cardiac muscle action potential and its physiological significance?

a) A rapid influx of Na^+ followed by immediate repolarization, shortening the refractory period.
b) A balance between Ca^{2+} influx and K^+ efflux that prolongs the action potential, preventing tetanic contractions and reducing fatigue.
c) An initial K^+ efflux succeeded by delayed Na^+ influx, resulting in a brief action potential.
d) Continuous Ca^{2+} influx with no K^+ efflux, leading to prolonged depolarization and potential arrhythmias.

Ans:b

QUIZ Time

physiology 9

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physiology 9

Which statement best describes the systolic phase of the cardiac cycle?
a) It is when the ventricles relax and fill with blood.
b) It represents the period during which the atria contract only.
c) It is when the ventricles contract and eject blood.
d) It corresponds to the time when all valves are open.

Ans:c

What is the duration of one complete cardiac cycle as mentioned in the lecture?
a) 0.6 seconds
b) 1.0 second
c) 0.8 seconds
d) 1.2 seconds

ans:c

During the isometric contraction phase of ventricular systole, which of the following is true?
a) Ventricular volume increases.
b) All valves are open.
c) Ventricular volume remains constant while pressure increases.
d) Atrial pressure exceeds ventricular pressure.

Ans:c

In which phase do the AV valves open, allowing rapid filling of the ventricles?
a) Rapid filling phase
b) Slow ejection phase
c) Isometric contraction phase
d) Isometric relaxation phase

Ans:a

physiology 9

What is the primary role of the atrial systole phase in the cardiac cycle?
a) It initiates ventricular contraction.
b) It causes the semilunar valves to open.
c) It pushes an additional 30% of blood into the ventricles.
d) It results in a significant decrease in ventricular pressure.

Ans:c

Which phase of ventricular systole ejects 70% of blood while the semilunar valves are open?
a) Rapid ejection phase
b) Slow ejection phase
c) Isometric contraction phase
d) Atrial systole phase

Ans:a

In which phase does the ventricle contract isometrically with constant volume and all valves closed?
a) Isometric contraction phase
b) Rapid filling phase
c) Slow ejection phase
d) Isometric relaxation phase

Ans:a

Which phase follows isometric relaxation and features open AV valves with a gradual increase in ventricular volume?
a) Slow filling phase
b) Rapid filling phase
c) Atrial systole phase
d) Rapid ejection phase
Ans:b