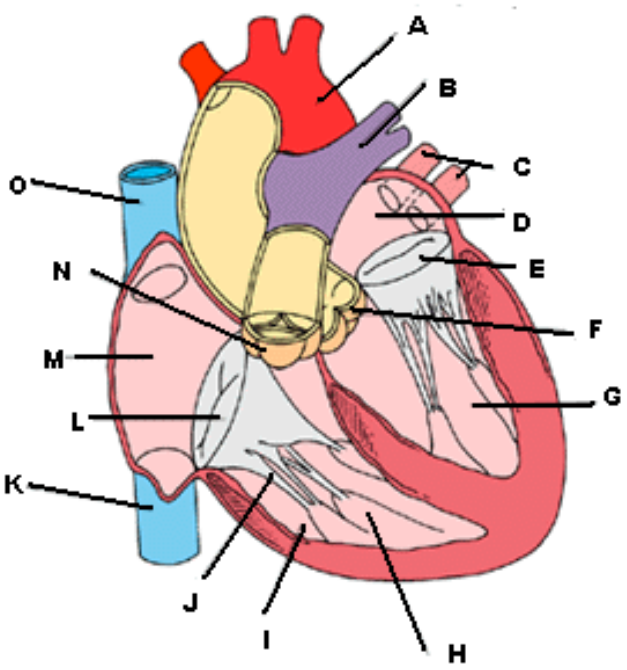
2008 Health Science – Sample Tournament
by Karen L. Lancour

Station A: Examine the diagram of the Heart and answer the following questions.



1. Name and give the function of the structure labeled **A**.

2. Name and give the function of the structure labeled **K.**

3. Name and give the function of the structure labeled **G**.

4. Name and give the Function of the structure labeled **M**.

5. Name and give the function of the structure labeled **E** .

Station B: Examine the EKG diagram and answer the following questions.

6. Using the diagram, explain what happens during the **P** phase

7. Using the diagram, explain what happens during the **QRS** phase.

8. Using the diagram, explain what happens during the **T** phase

Station C: Explain the effects of the following drugs on the brain and circulatory system

9. alcohol -

10. caffeine –

11. nicotine –

12. barbiturates –

13. opiates –

Station D:

14. Explain the electrical system of the heart.

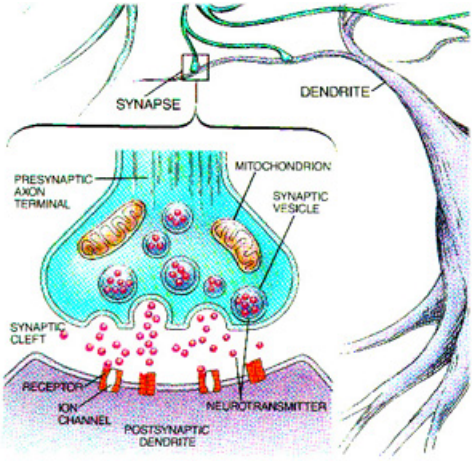
15. What happens to hemoglobin in sickle cell anemia?

Station E:

16. Explain the mechanism by which a nerve impulse travels along a nerve cell.
Use diagrams if it will help you with your explanation.

Station F:

17. Explain the process being demonstrated
by the diagram to the right.



Station G:
Give the function for the following of the structures.

18. Medulla oblongata

19. Reticular formation

20. Meninges

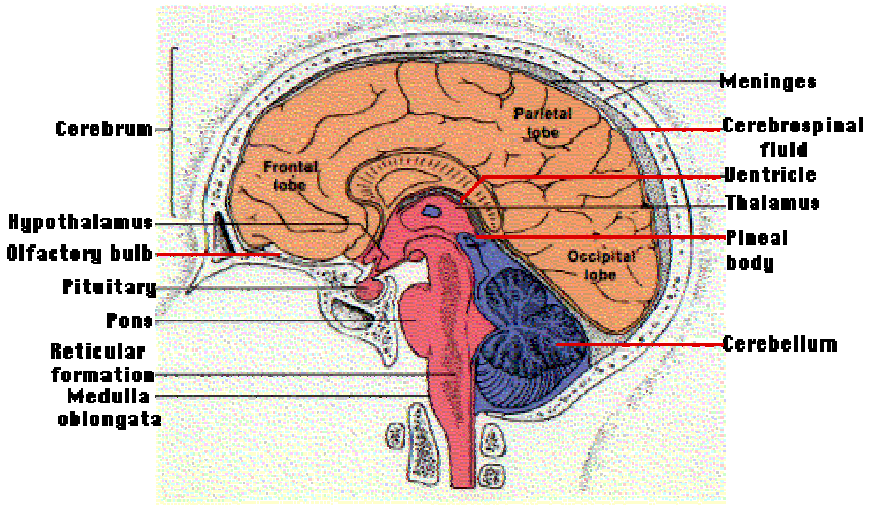
21. Cerebrum

22. Thalamus

23. Cerebrospinal fluid

24. Cerebellum

25. Occipital lobe



Station H: Explain the following diseases and their treatment.
26. Parkinson's disease

27. Epilepsy

28. Sickle Cell Anemia

Station I : Problems – Use the formulas to solve the following problems.
29. If systolic pressure is 122 and diastolic pressure is 84, what are the pulse pressure and the Mean Arterial Pressure?

30. Mrs. Jones has a heart rate of 85, a systolic pressure of 140 and diastolic pressure of 60, and an end diastolic volume of 110 and end systolic volume of 40. What is her cardiac output?

Practice Activity – Competition Design

Develop Stations which collect data, interpret actual experimental data, and/or address questions related to the function of the nervous and circulatory system in health and disease.
Formulate questions and answers related to these stations.

2007 Health Science – Sample Tournament - Answer Key

Station A:

1. Aorta – carries oxygenated blood from heart to body
2. Vena cava – brings blood back to heart from body
3. Left ventricle – pumps blood through aorta to body
4. Right Atrium – collects blood coming in from vena cava
5. Mitrial valve - keeps blood from sloshing back into left atrium

Station B:

6. P = atria contract (depolarization)
7. QRS = atria relaxes (repolarization) as ventricles contract (depolarization)
8. T = ventricles relax (repolarization)

Station C:

9. alcohol – slows down processing of information from senses, inhibits thought processes, pupils dialate, heart rate slows
10. caffeine - increase in blood pressure and pulse, increase neuron firing in brain
11. nicotine - rapid heartbeat and increased blood pressure, increased release of acetylcholine
12. barbiturates – bind to GABA receptors, slow down brain
13. opiates – stimulates opiate receptors in brain, pain reliever, euphoria,

Station D:

14. Impulse from SA node spreads in all directions causing atrial to contract. When the impulse reaches AV node, it relays them by way of the AV bundle and Purkinje fibers to the ventricles causing them to contract.
15. The hemoglobin molecule is less soluble and forms solid crystals when blood oxygen is low causing the RBC to collapse

Station E:

16. Explain the mechanism by which a nerve impulse travels along a nerve cell.
Sodium pump explained

Station F:

17. Explain the process of an impulse at the synapse.
Neurotransmitters – stimulant and inhibitory

Station G:

18. Medulla oblongata – vital reflexes as heart beat, respiration
19. Reticular formation – sets priorities
20. Meninges – protective coverings over brain
21. Cerebrum – conscious activities
22. Thalamus – brain's switchboard
23. Cerebrospinal fluid – absorbs shock to protect brain & spine
24. Cerebellum – muscle coordination, muscle tone, balance
25. Occipital lobe – vision

Station H:

26. Parkinson's Disease - nervous disorder caused by deficiency of dopamine – medications to increase levels of dopamine
27. Epilepsy – brain disorders that cause seizures – antiseizure medications help
28. Sickle Cell Anemia – inherited recessive disorder causing abnormal shaped red blood cells – medications and if necessary transfusion of RBC's

Station I:

29. pp = 38 hg of Mercury and MAP = 96.7 rounded to 97
30. CO = 5950 mL/min