# Alternative Item Formats: Sample Questions

The purpose of the National Certification Examination (NCE) and the Self-Evaluation Examination (SEE) is to gather statistical information to make measured assessments of the knowledge, skills, and abilities possessed by and necessary for entry-level nurse anesthesia practitioners. In order to enhance the ability of the NCE and SEE to assess entry-level competency in the field of nurse anesthesia, the National Board of Certification and Recertification for Nurse Anesthetists (NBCRNA) utilizes various types of items within the examination.

The item types that may be encountered while taking the NCE and SEE include the traditional multiple-choice (MC) type, as well as the following alternative item types: multi-select (MS), short answer (SA), drag-and-drop (DD), and hotspot (HS). Alternative item types are utilized when the assessment of important subject matter is difficult using the traditional multiple-choice format.

Below are several examples of these question formats. The intent of providing these examples is to give the examinee an idea of how the questions will appear on the NCE or the SEE, and NOT to provide an adequate sampling of the content outline.

*It is important to note that the following examples are samples only. They may not be the exact representation of the alternative question formats presented on the NCE and SEE.*

The correct answers for the following questions may be found on the final pages.

To learn more about these alternative item formats, please go to the Exam Tutorial on the NBCRNA website. Please also see the Alternative Item FAQs in the same website section.

**Multi-Select (MS) Sample Questions**

1. What are the hemodynamic goals of hypertrophic cardiomyopathy?
   **(Select 2.)**

   - ☐ A. Decrease contractility
   - ☐ B. Decrease preload
   - ☐ C. Increase afterload
   - ☐ D. Increase heart rate

2. What are potential complications of pulmonary artery catheter insertion?
   **(Select 2.)**

   - ☐ A. Cardiac perforation
   - ☐ B. Left bundle-branch block
   - ☐ C. Mitral valve rupture
   - ☐ D. Pulmonary infarction

3. Pharmacologic characteristics that best describe the effect of naloxone at opioid receptors include:
   **(Select 2.)**

   - ☐ A. affinity.
   - ☐ B. efficacy.
   - ☐ C. intrinsic activity.
   - ☐ D. reversibility.
   - ☐ E. stereo selectivity.

4. Abnormal placental implantations beyond the endometrium include:
   **(Select 3.)**

   - ☐ A. abruptio placentae.
   - ☐ B. placenta accreta.
   - ☐ C. placenta increta.
   - ☐ D. placenta percreta.
   - ☐ E. placenta previa.

5. Characteristics of Eaton-Lambert syndrome include:
   **(Select 3.)**

   - ☐ A. positive response to anticholinesterase agents.
   - ☐ B. improved strength with activity.
   - ☐ C. reduced anticholine release.
   - ☐ D. destruction of acetylcholine receptors.
   - ☐ E. postjunctional defect.
   - ☐ F. sensitivity to all muscle relaxants.


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

6. Which conditions will result in elevated T4 levels?
**(Select 2.)**

- ☐ A. Hyperthyroidism
- ☐ B. Primary hypothyroidism
- ☐ C. Secondary hypothyroidism
- ☐ D. Pregnancy

7. A Mallampati Class II airway assessment involves visualization of which pharyngeal structures?
**(Select 3.)**

- ☐ A. Upper incisors
- ☐ B. Soft palate
- ☐ C. Tonsillar pillars
- ☐ D. Tonsillar fauces
- ☐ E. Uvula
- ☐ F. Epiglottis

8. Which of the following are effects of muscle relaxants?
**(Select 3.)**

- ☐ A. Blocking acetylcholine from reaching the nicotinic cholinergic receptor
- ☐ B. Blocking acetylcholine release from the motor nerve terminal
- ☐ C. Causing prolonged depolarization of the motor end plate
- ☐ D. Preventing magnesium from facilitating actin-myosin coupling

9. Which of the following are mechanisms of action of anticonvulsants?
**(Select 3.)**

- ☐ A. Inhibition of the actions of GABA
- ☐ B. Inhibition of NMDA receptors
- ☐ C. Inactivation of sodium receptors
- ☐ D. Limitation of the activation of calcium channels

10. The musculocutaneous nerve arises from which nerve roots?
**(Select 3.)**

- ☐ A. C5
- ☐ B. C6
- ☐ C. C7
- ☐ D. C8
- ☐ E. T1
- ☐ F. T2


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

11. Successful laryngoscopy for intubation requires alignment of which 3 axes?
**(Select 3.)**

- ☐ A. Nasal
- ☐ B. Oral
- ☐ C. Tracheal
- ☐ D. Laryngeal
- ☐ E. Glottic
- ☐ F. Pharyngeal

12. Which of the following pulmonary function test results indicate restrictive pulmonary disease?
**(Select 3.)**

- ☐ A. Decreased forced vital capacity (FVC)
- ☐ B. Decreased $FEV_1$/FVC ratio
- ☐ C. Decreased FEF 25%-75%
- ☐ D. Decreased total lung capacity (TLC)
- ☐ E. Decreased functional residual capacity (FRC)
- ☐ F. Increased $FEV_1$

13. Pharmacological management of thyroid storm may include:
**(Select 3.)**

- ☐ A. sodium thiosulfate.
- ☐ B. sodium iodide.
- ☐ C. levothyroxine.
- ☐ D. hydrocortisone.
- ☐ E. methylene blue.
- ☐ F. propranolol.


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

**Short Answer (SA) Sample Questions**

**NOTE:**
**When responding to the calculation questions, enter the number only in the format requested. Do NOT enter units or labels (e.g., liters, L, mm Hg), or the response will be marked wrong.**

1. What is the BMI for a 70-kg patient who is 1.6 meters tall?

   **Enter your answer below as a whole number with no decimals, in kg/m$^2$.**

   _____ kg/m$^2$

2. Calculate cardiac output given the following hemodynamic parameters: stroke volume, 60 mL; blood pressure, 150/70 mm Hg; heart rate, 50/min.

   **Enter your answer below as a whole number with no decimals, in L/min.**

   _____ L/min

3. Use of positive pressure greater than how many mm Hg with a laryngeal mask airway may cause stomach inflation?

   **Enter your answer below as a whole number with no decimals, in mm Hg.**

   _____ mm Hg

4. In the lateral position, blood flow to the dependent lung of the anesthetized patient most represents which zone of flow?

   **Enter your answer below as a whole number with no decimals.**

   Zone _____


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

5. What is the hourly maintenance fluid rate for an 11-pound infant?

   **Enter your answer below as a whole number with no decimals, in mL/h.**

   _____ mL/h

6. What is the hourly maintenance fluid requirement for an 80-kg male?

   **Enter your answer below as a whole number with no decimals, in mL/h.**

   _____ mL/h

7. On the 12-lead ECG, what is the upper limit of the normal R-wave axis?

   **Enter your answer below as a whole number with no decimals, in degrees (°).**

   _____ °

8. A patient's blood pressure is 140/70 mm Hg. What is the mean arterial pressure?

   **Enter your answer below as a whole number with no decimals, in mm Hg.**

   _____ mm Hg

9. A patient is 72 inches tall and weighs 200 pounds. Calculate this patient's BMI.

   **Enter your answer below as a whole number with no decimals, in $kg/m^2$.**

   _____ $kg/m^2$

10. What is the cerebral perfusion pressure for a patient with a blood pressure of 130/70 mm Hg and intracranial pressure (ICP) of 18 mm Hg?

    **Enter your answer below as a whole number with no decimals, in mm Hg.**

    _____ mm Hg

**Drag and Drop, Matching/Ordering Sample Questions**

1. Match the action on the vocal cords with the intrinsic muscle that causes it.

| Action on Vocal Cords | Muscle |
|---|---|
| Elongates | Posterior cricoarytenoid |
| Adducts | Lateral cricoarytenoid |
| Relaxes | Cricothyroid |
| Abducts | Thyroarytenoid |

2. Match each blood gas partition coefficient with its corresponding inhalation agent.

| Blood Gas Partition Coefficient | Inhalation Agent |
|---|---|
| 2.5 | Isoflurane |
| 1.46 | Desflurane |
| 0.42 | Sevoflurane |
| 0.65 | Halothane |


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

3. Match the type of breathing system with its description.

| Breathing System | Description |
|---|---|
| Open | Complete rebreathing with extremely low fresh gas flow |
| Semi-open | No reservoir is used and no rebreathing |
| Semi-closed | A reservoir is used with no rebreathing |
| Closed | A reservoir is used with partial rebreathing |

4. Order the relative potencies of the indicated inhalation agents from highest to lowest potency.

| Inhalation Agent | Order |
|---|---|
| Isoflurane | First (Highest) |
| Nitrous oxide | Second |
| Desflurane | Third |
| Sevoflurane | Fourth (Lowest) |



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

5. Match the nurse anesthetist with her contribution to the profession.

| Nurse Anesthetist | Contribution |
|---|---|
| Alice Magaw | Earliest known nurse anesthetist |
| Sister Mary Bernard | Established the National Association of Nurse Anesthetists |
| Agatha Hodgins | Establishment of curriculum and standards in schools of nurse anesthesia |
| Helen Lamb | Mother of anesthesia |

6. Match the autonomic drug class with its associated physiologic effect.

| Autonomic Drug Class | Physiologic Effect |
|---|---|
| Alpha-agonist | Tachycardia |
| Alpha-blocker | Vasodilation |
| Beta-agonist | Uterine contraction |
| Anticholinergic | Increased blood sugar |


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

7. Match the patient age with the associated airway-related item.

| Patient Age | Airway-Related Item |
| --- | --- |
| 1-year-old | 4.5 cuffed endotracheal tube size |
| 10-year-old | 2.5 uncuffed oral endotracheal tube size |
| Preterm infant | #1 straight blade |
| 2-year-old | 17-cm oral endotracheal tube insertion depth |

8. Match the appropriate laboratory test to the coagulation-related event.

| Laboratory Test | Event |
| --- | --- |
| Partial thromboplastin time | Nonsteroidal anticoagulant use |
| Bleeding time | Warfarin administration |
| D-dimer | Heparin infusion |
| Prothrombin time | Active fibrinolysis |



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

9. Regarding renal control of blood pressure, match the stimulus to the factor **MOST** immediately stimulated by it.

| Stimulus | Factor |
|---|---|
| Angiotensin I | Angiotensin I |
| Angiotensin II | Angiotensin II |
| Hypotension | Aldosterone |
| Renin | Renin |

10. Match each medication used in aspiration prophylaxis with its classification.

| Medication | Classification |
|---|---|
| Bicitra | Nonparticulate antacid |
| Metoclopramide | Gastric prokinetic |
| Omeprazole | Histamine-2 antagonist |
| Ranitidine | Proton pump inhibitor |


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

11. Match the appropriate ST elevation finding in the ECG leads to each part of the heart.

| ST Elevation | Part of the Heart |
|---|---|
| II, III, aVF | Lateral |
| $V_1$-$V_2$ | Inferior |
| $V_4$-$V_5$ | Septal |
| I, aVL | Anterior |

12. Match the twitch response with its corresponding nerve origin.

| Twitch | Nerve Origin |
|---|---|
| Adductor twitch | Femoral |
| Quadriceps twitch | Obturator |
| Dorsiflexion | Tibial nerve |
| Plantar flexion | Peroneal nerve |



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

13. Match the drug with its respective chemical classification.

| Drug | Chemical Classification |
| --- | --- |
| Droperidol | Imidazole |
| Etomidate | Phenol |
| Ketamine | Butyrophenone |
| Propofol | Phencyclidine |



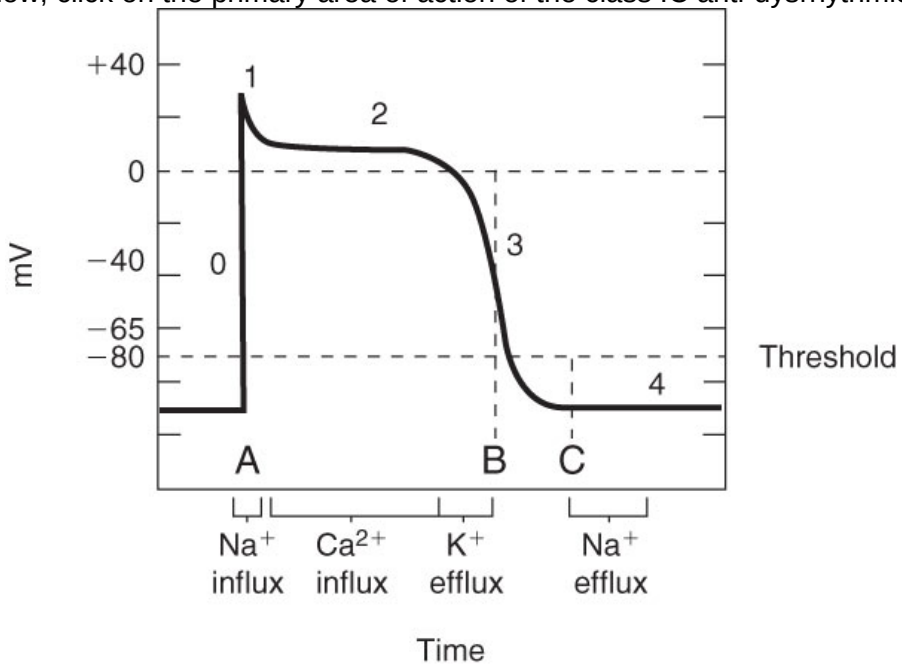
8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

NBCRNA

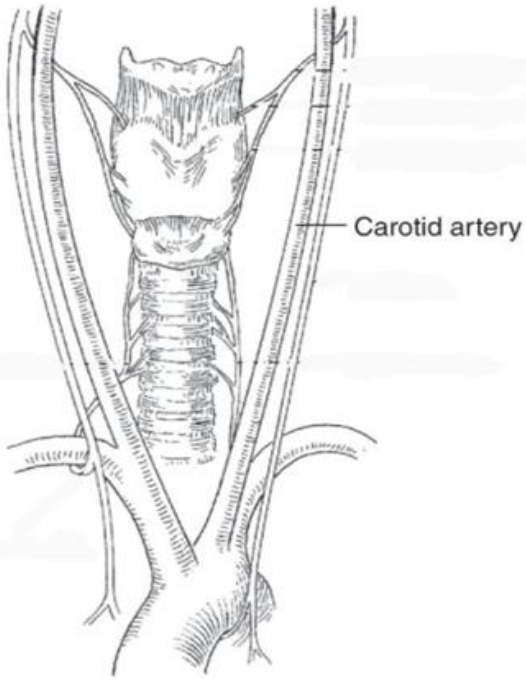
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

**Hotspot (HS) Sample Questions**

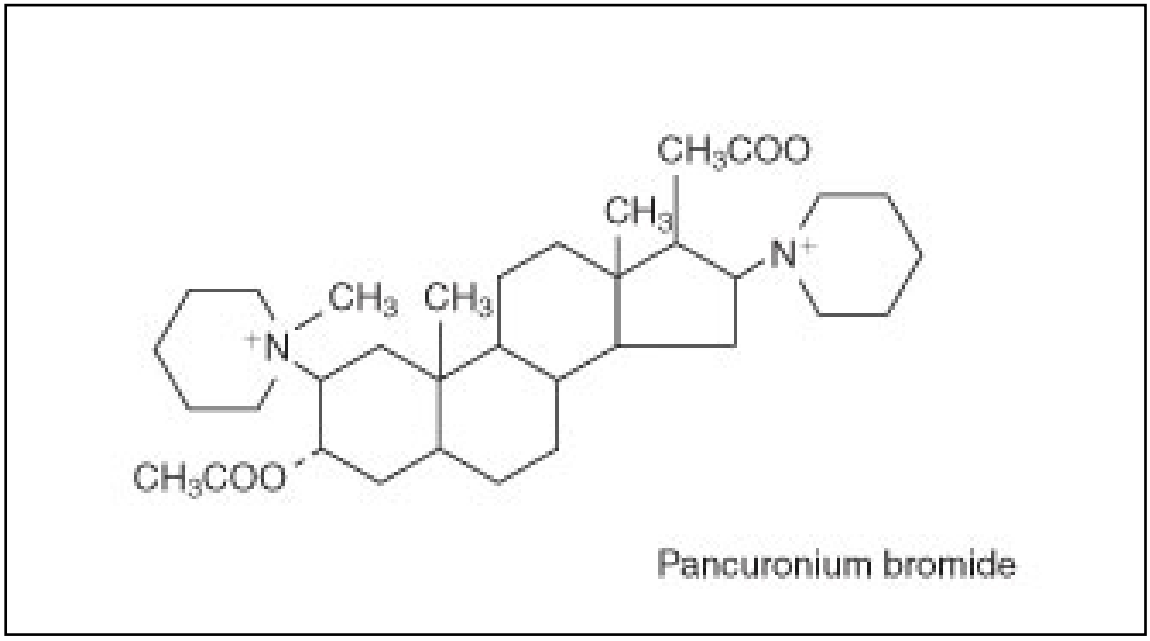
1. In the image below, click on the primary area of action of the class IC anti-dysrhythmic drugs.



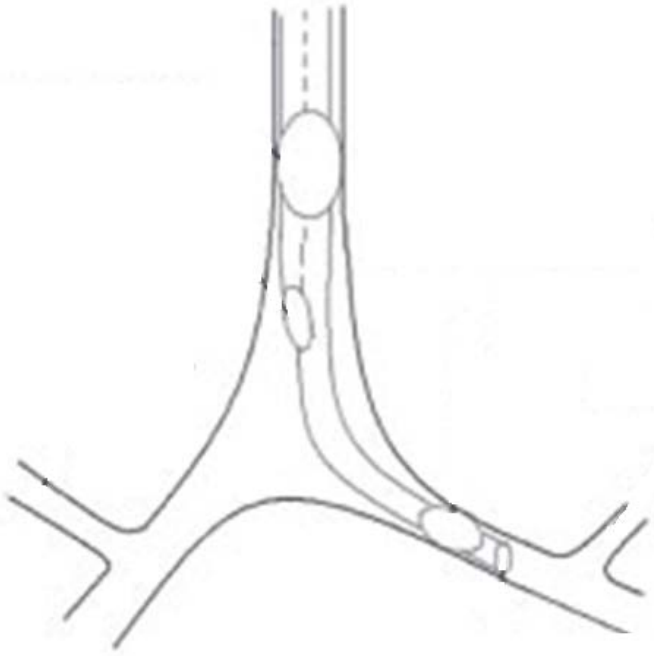

2. In the figure below, click on the nerve that may be compressed during mediastinoscopy.



3. In the diagram below, click on the only aspect of pancuronium's chemical structure which is altered to create vecuronium.




4. In the figure below showing a properly placed left-sided double-lumen endotracheal tube, click on the line indicating the tube's tracheal orifice.



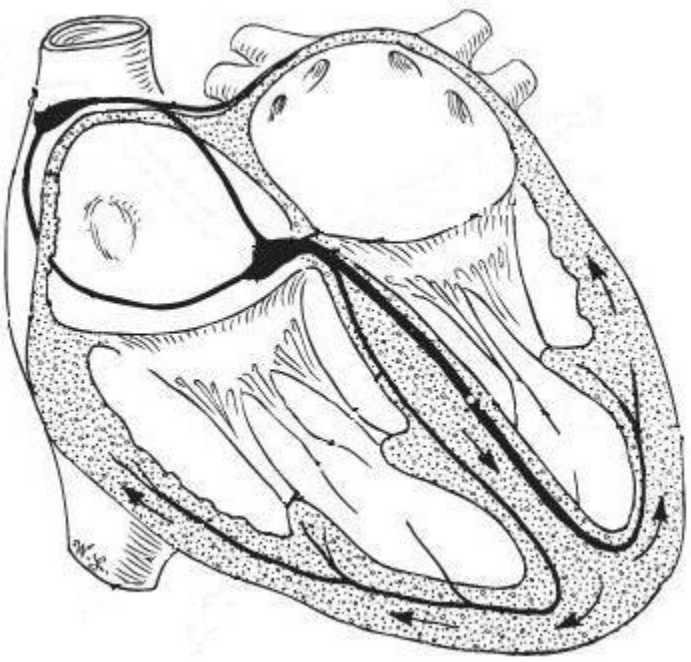


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

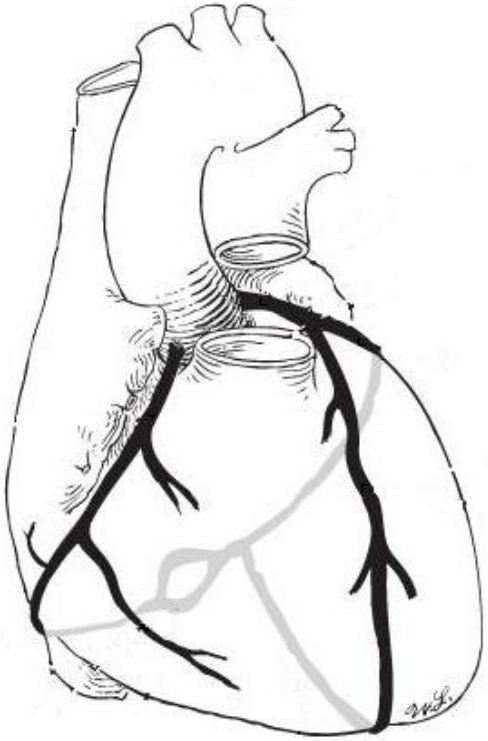
NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

5. In the diagram of the cardiac conduction system below, click on the area that conducts the highest intrinsic rate.



6. In the diagram of the coronary arterial circulation below, click on the artery that supplies blood to the sinoatrial and atrioventicular nodes.



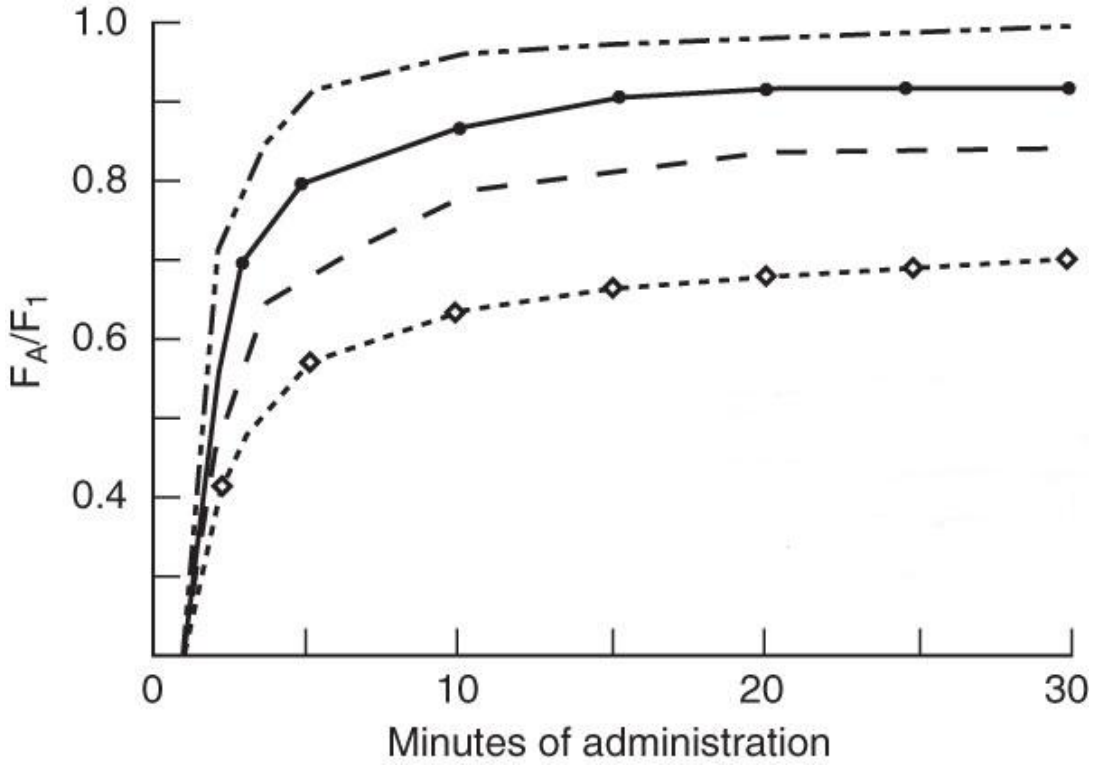


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

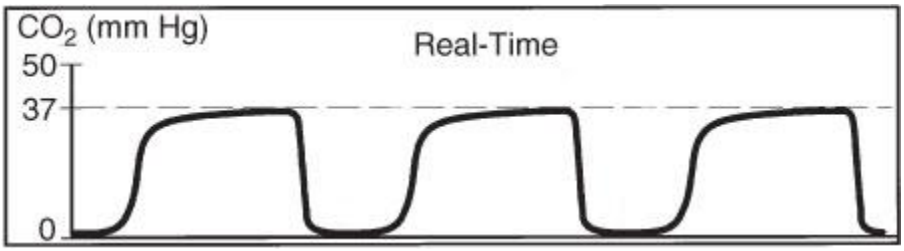
NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

7. The graph below depicts $F_A/F_1$ of isoflurane, sevoflurane, desflurane, and nitrous oxide. Click on the line that is characteristic of desflurane.



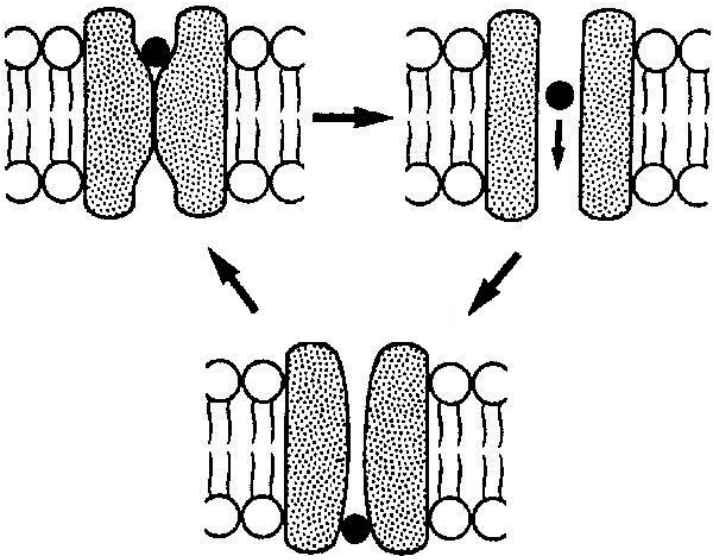

8. Below is a normal capnogram. Where on the graph would rebreathing be seen, if it were present?






8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

9. Click the form of the neuronal sodium channel receptor to which binding by a local anesthetic is most difficult.



10. Designate the portion of the anesthesia delivery system which best signifies the beginning of the low pressure circuit.

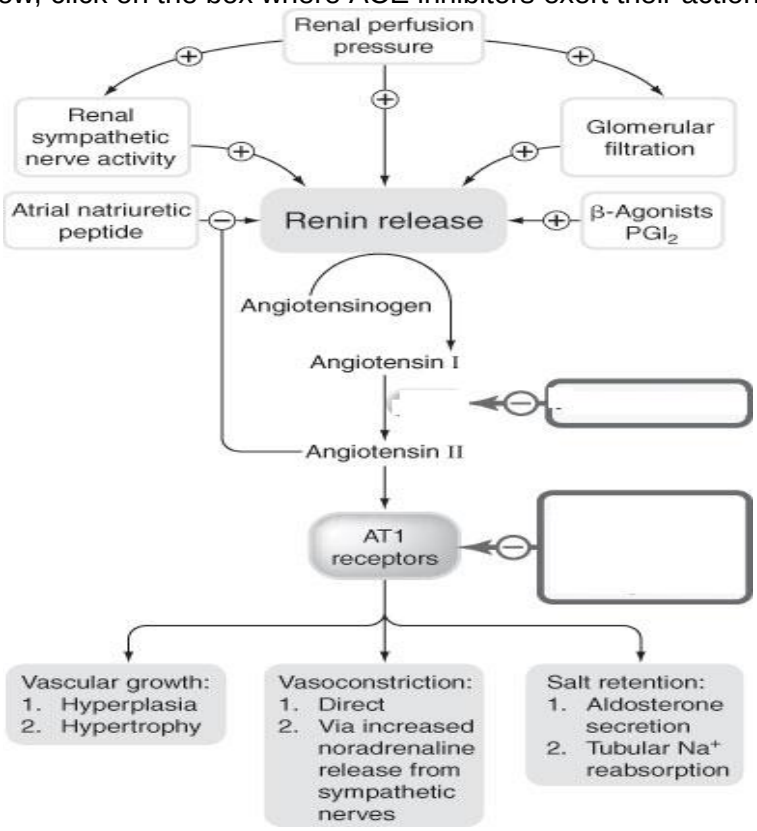



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

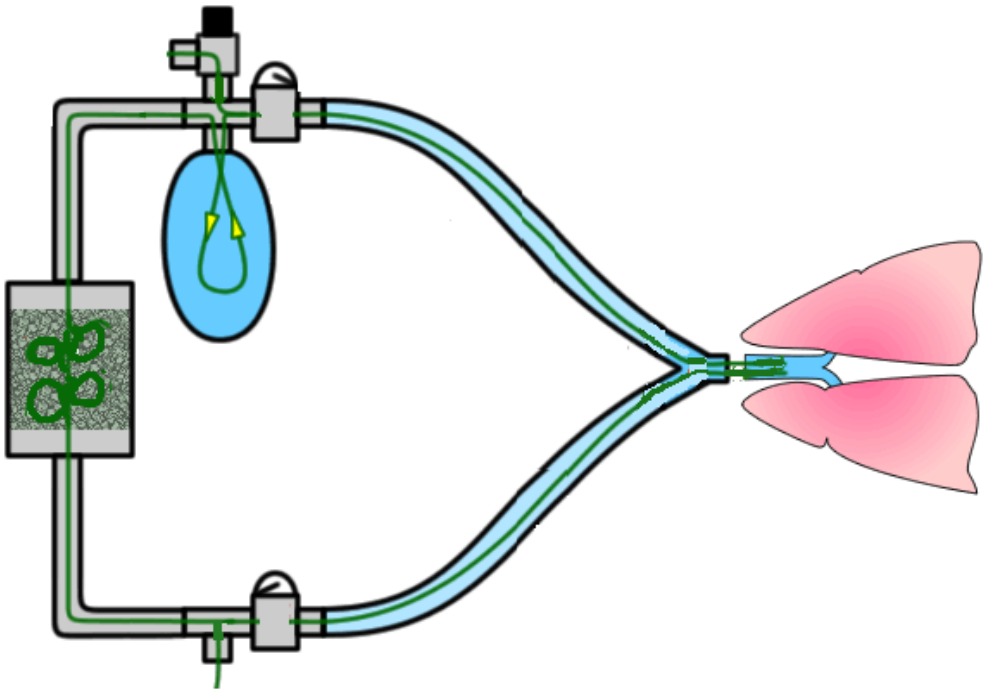
NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

11. In the diagram below, click on the box where ACE inhibitors exert their action:




12. Click on the expiratory side of this circle circuit.





8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

## Correct Answers

### Multi-Select (MS) Sample Questions

| | | | | | |
|---|---|---|---|---|---|
| 1. | A, C | 6. | A, D | 11. | B, D, F |
| 2. | A, D | 7. | B, D, E | 12. | A, D, E |
| 3. | A, D | 8. | A, B, C | 13. | B, D, F |
| 4. | B, C, D | 9. | B, C, D | | |
| 5. | B, C, F | 10. | A, B, C | | |

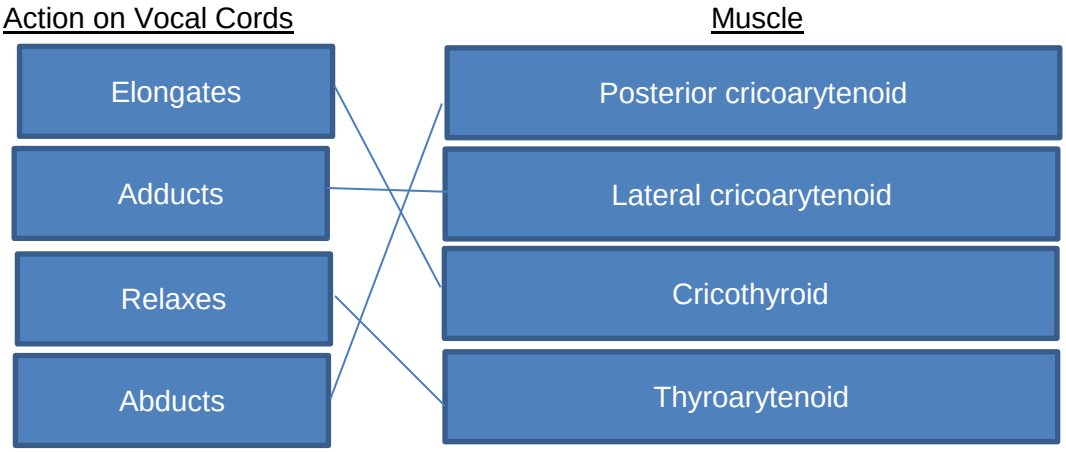
### Short Answer (SA) Sample Questions

| | | | | | |
|---|---|---|---|---|---|
| 1. | 27 | 5. | 20 | 9. | 27 |
| 2. | 3 | 6. | 120 | 10. | 72 |
| 3. | 20 | 7. | 90 | | |
| 4. | 3 | 8. | 93 | | |

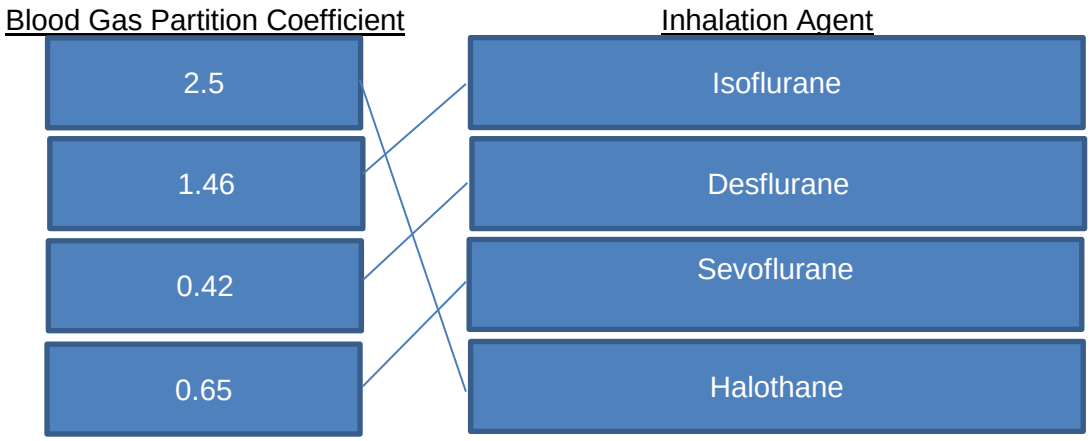

8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

**Drag and Drop Sample Questions**

1. Match the action on the vocal cords with the intrinsic muscle that causes it.



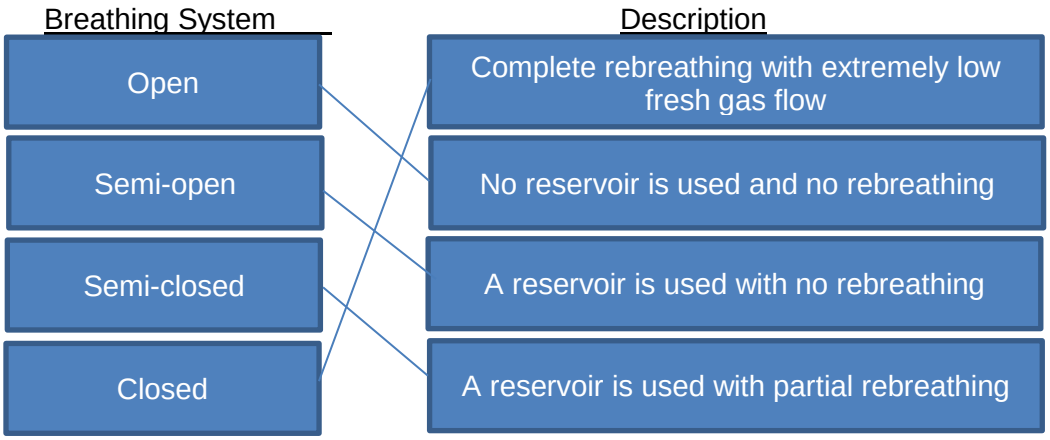

2. Match each blood gas partition coefficient with its corresponding inhalation agent.



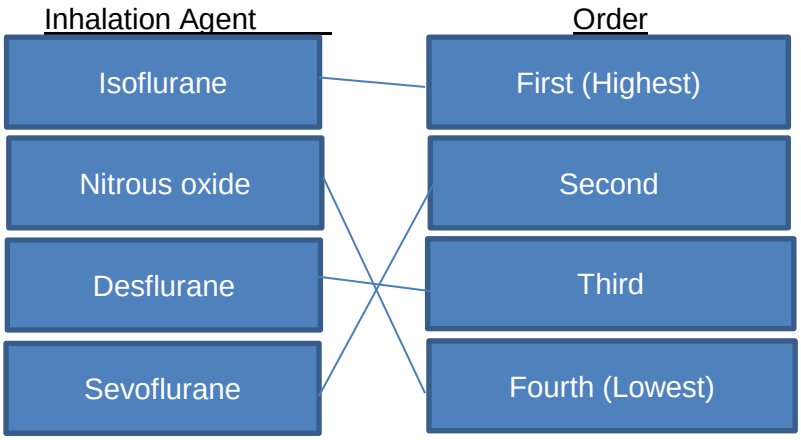



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

3. Match the type of breathing system with its description.



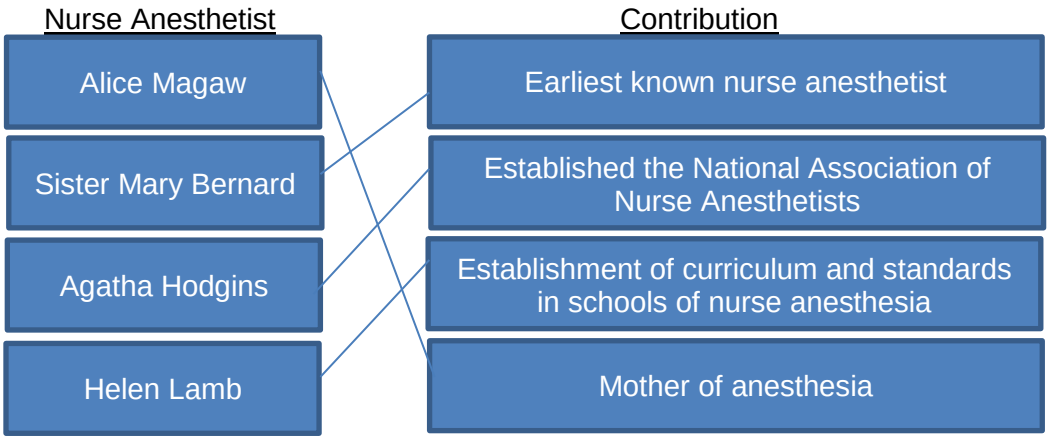

4. Order the relative potencies of the indicated inhalation agents from highest to lowest potency.



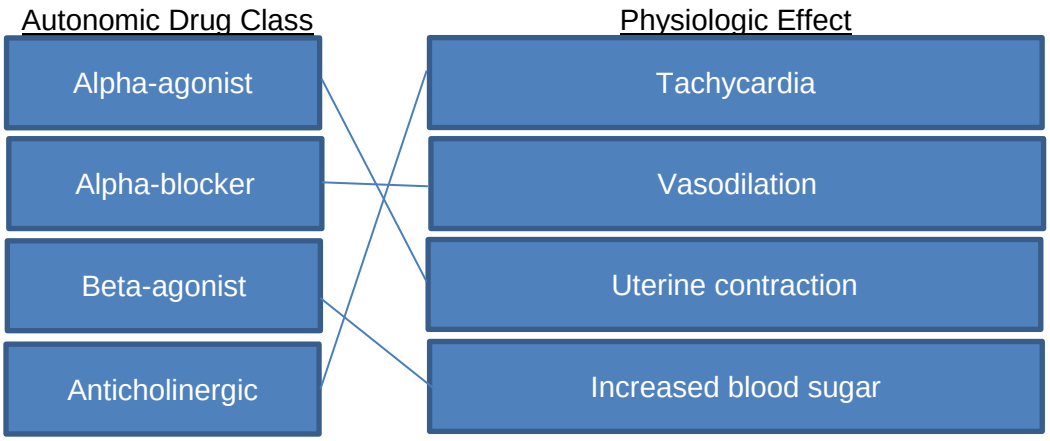



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

5. Match the nurse anesthetist with her contribution to the profession.



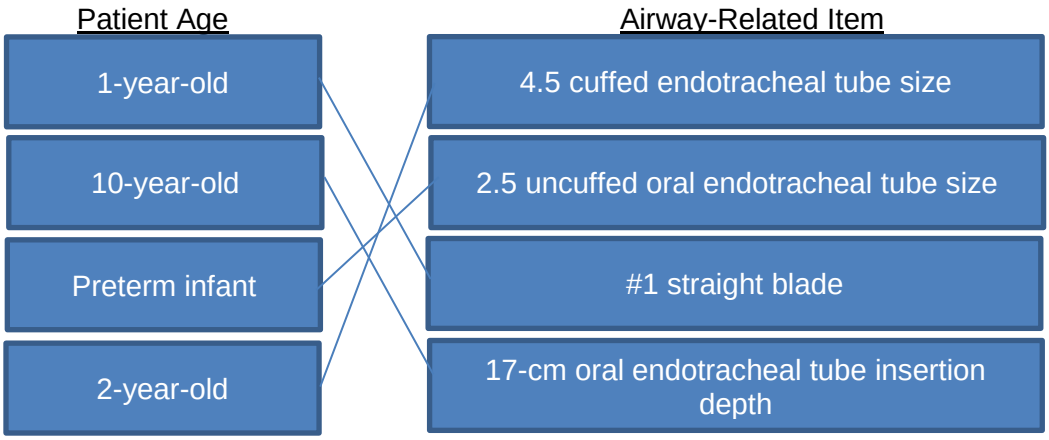

6. Match the autonomic drug class with its associated physiologic effect.



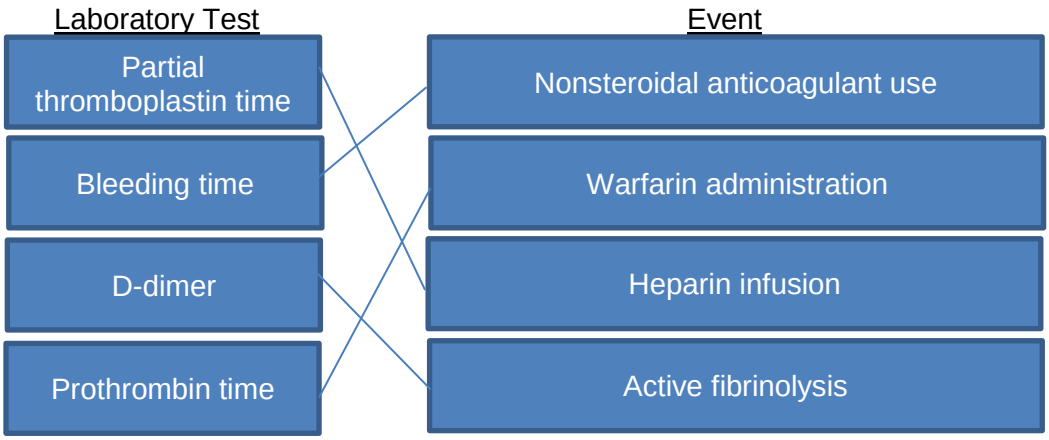



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

7. Match the patient age with the associated airway-related item.




8. Match the appropriate laboratory test to the coagulation-related event.



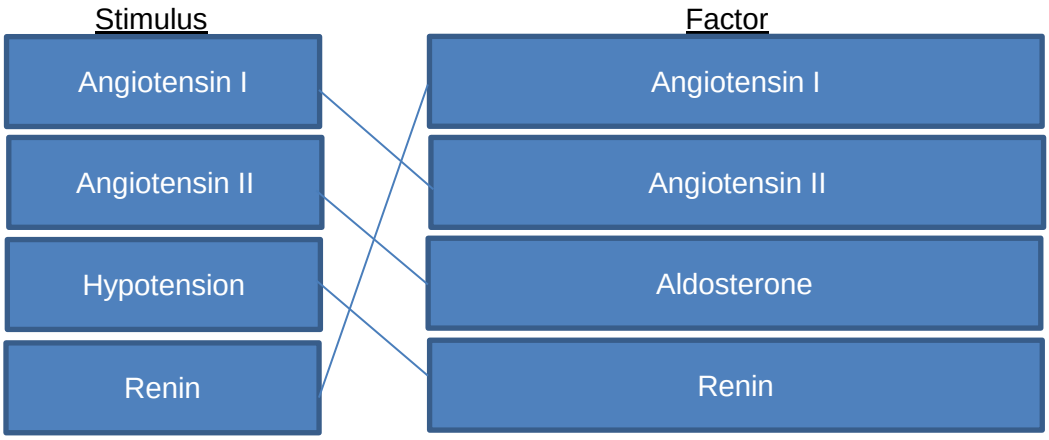



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

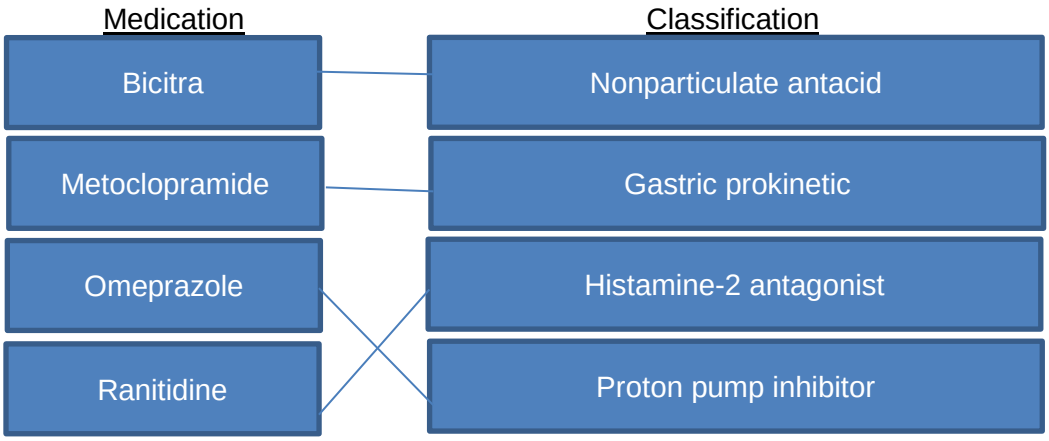
NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

9. Regarding renal control of blood pressure, match the stimulus to the factor **MOST** immediately stimulated by it.



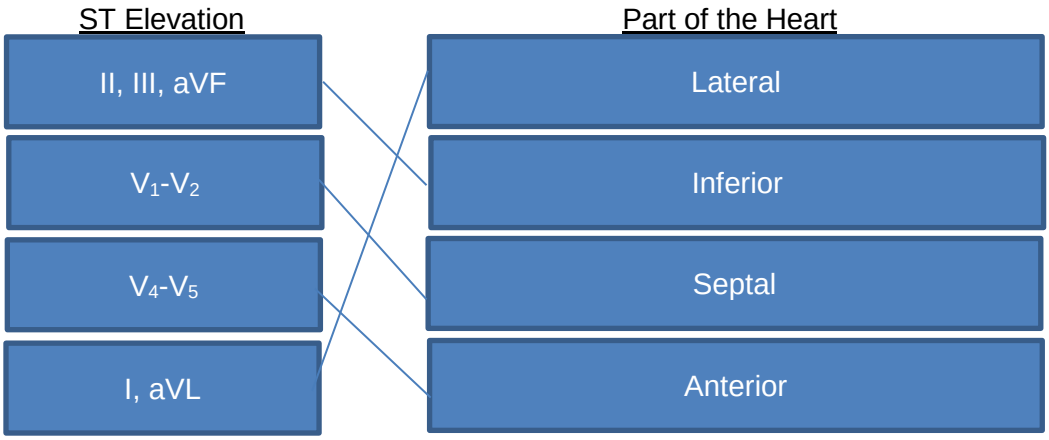

10. Match each medication used in aspiration prophylaxis with its classification.



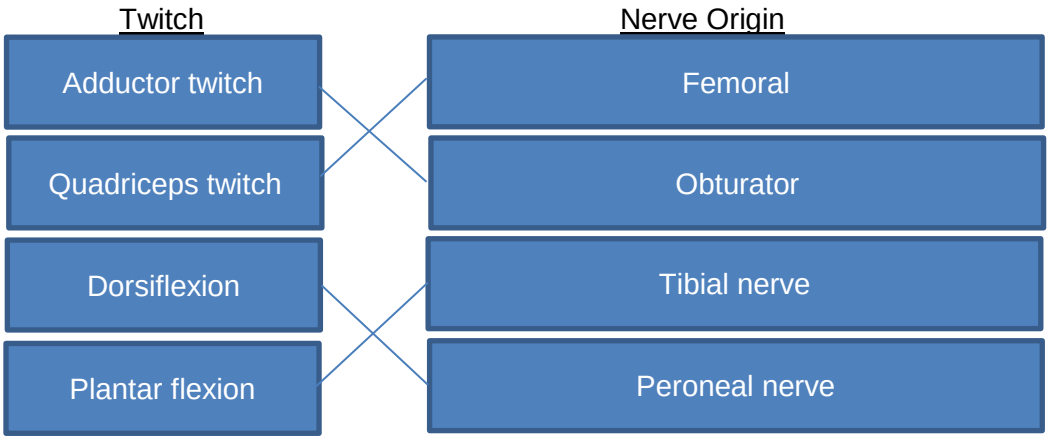


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

11. Match the appropriate ST elevation finding in the ECG leads to each part of the heart.



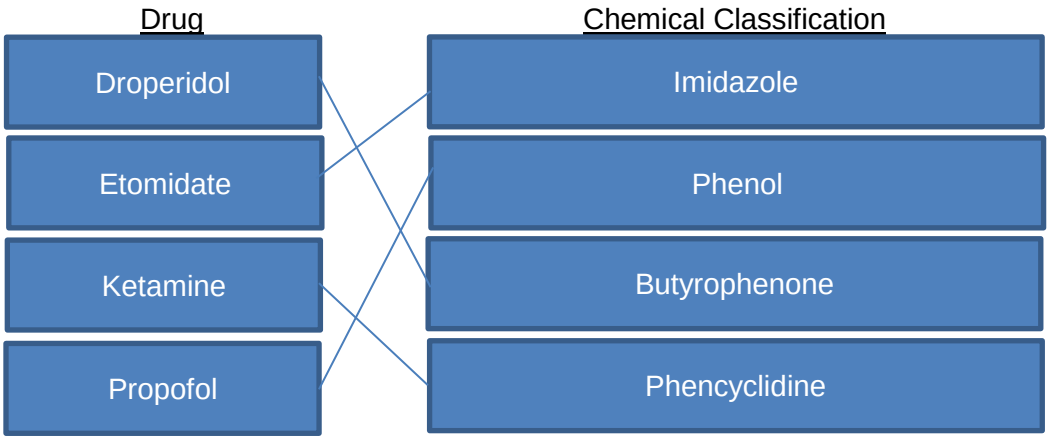

12. Match the twitch response with its corresponding nerve origin.






8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

13. Match the drug with its respective chemical classification.





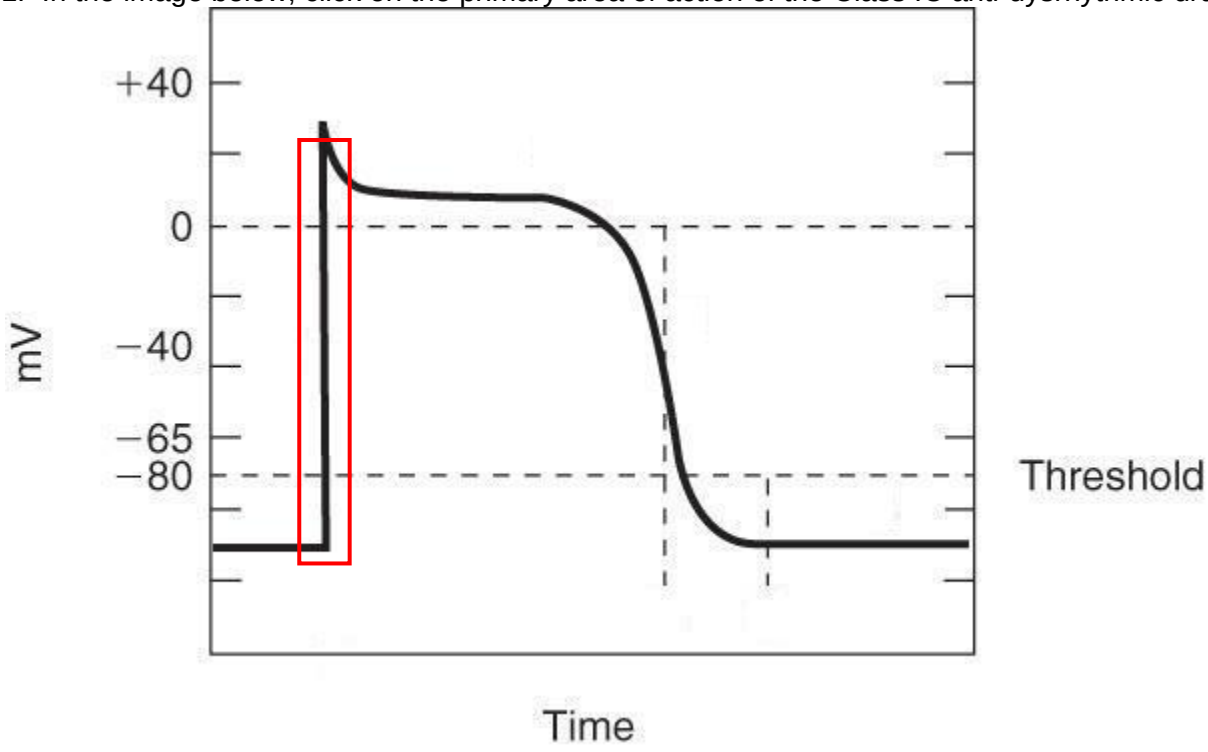

8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

NBCRNA

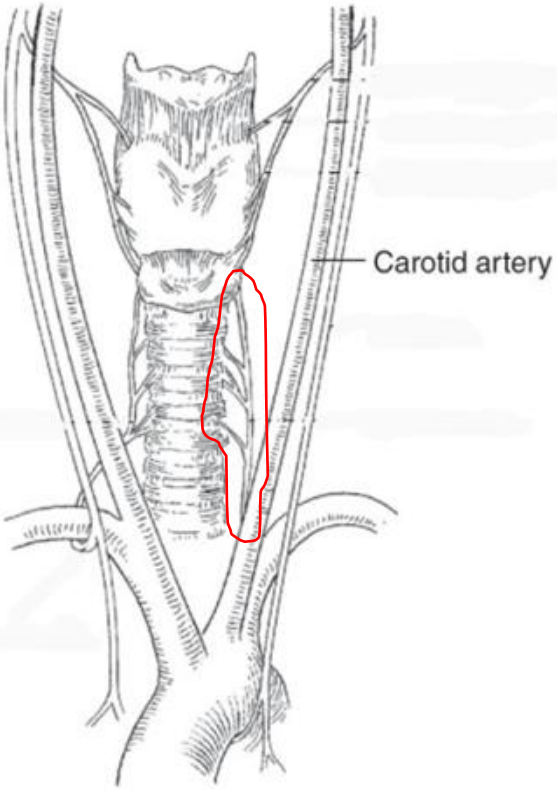
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

**Hotspot Sample Questions**

1. In the image below, click on the primary area of action of the Class IC anti-dysrhythmic drugs.




2. In the figure below, click on the nerve that may be compressed during mediastinoscopy.



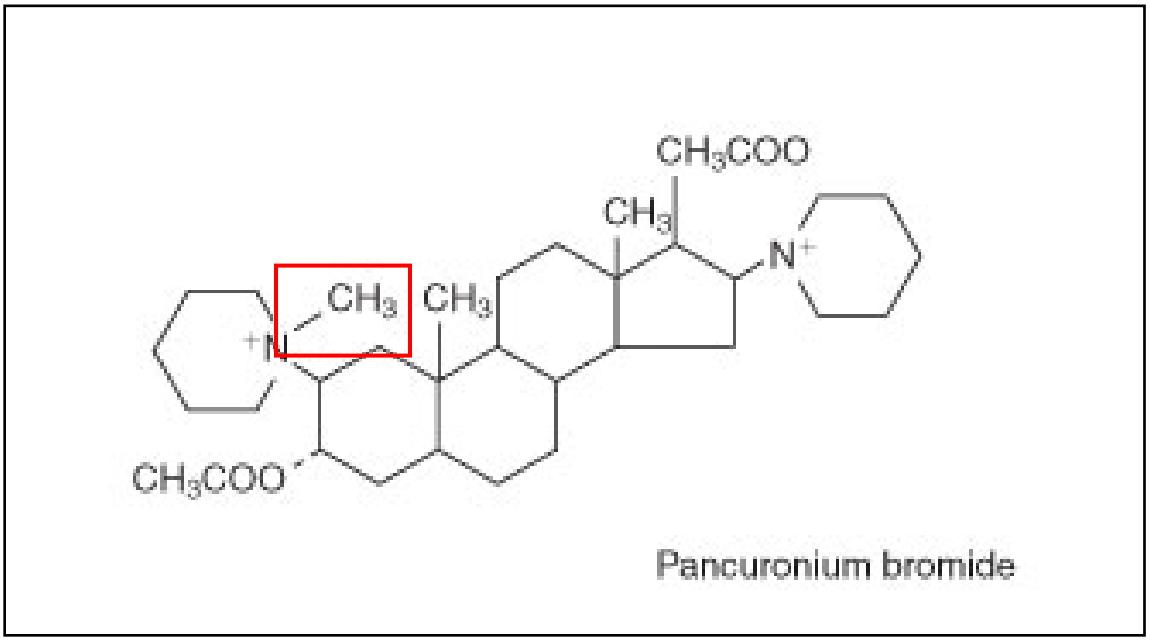



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

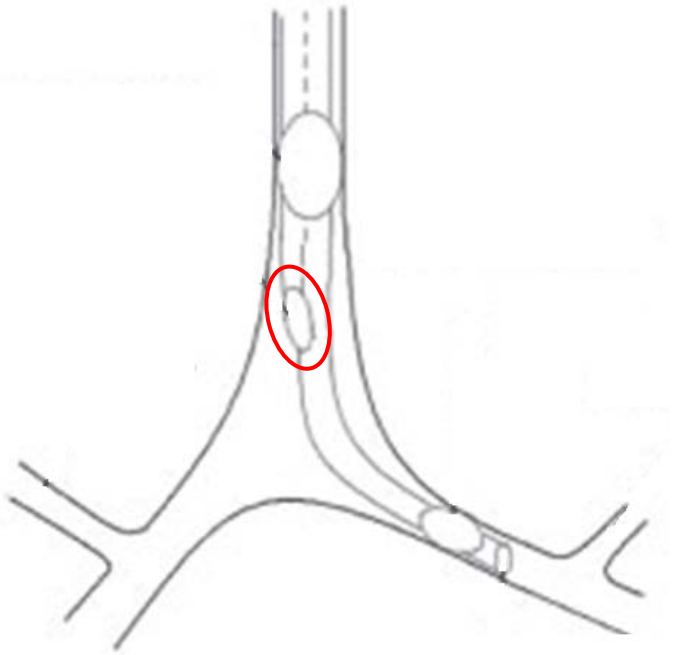
NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

3. In the diagram below, click on the only aspect of pancuronium's chemical structure which is altered to create vecuronium.




4. In the figure below showing a properly placed left-sided double-lumen endotracheal tube, click on the tube's tracheal orifice.



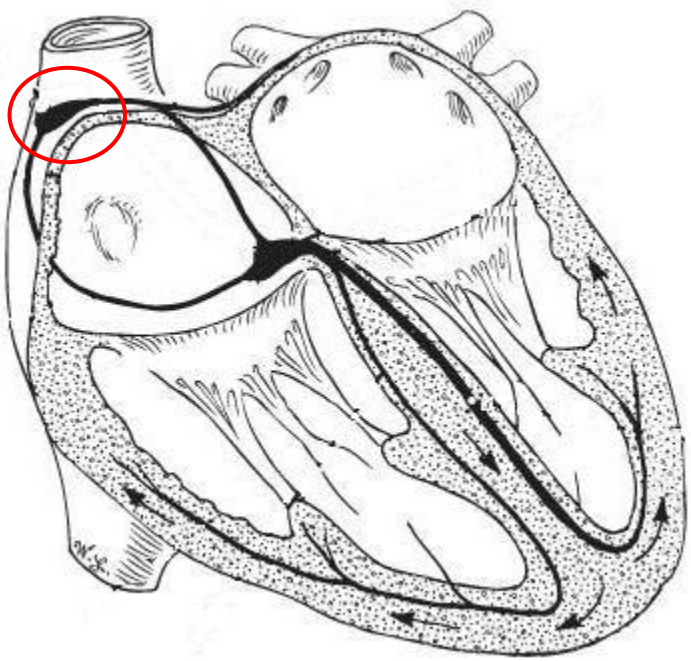


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

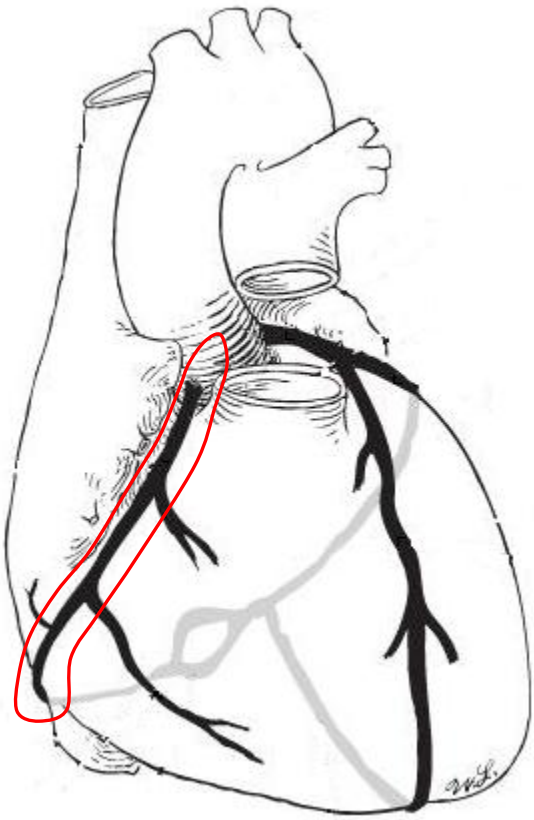
NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

5. In the diagram of the cardiac conduction system below, click on the area that conducts the highest intrinsic rate.



6. In the diagram of the coronary arterial circulation below, click on the artery that supplies blood to the sinoatrial and atrioventricular nodes.



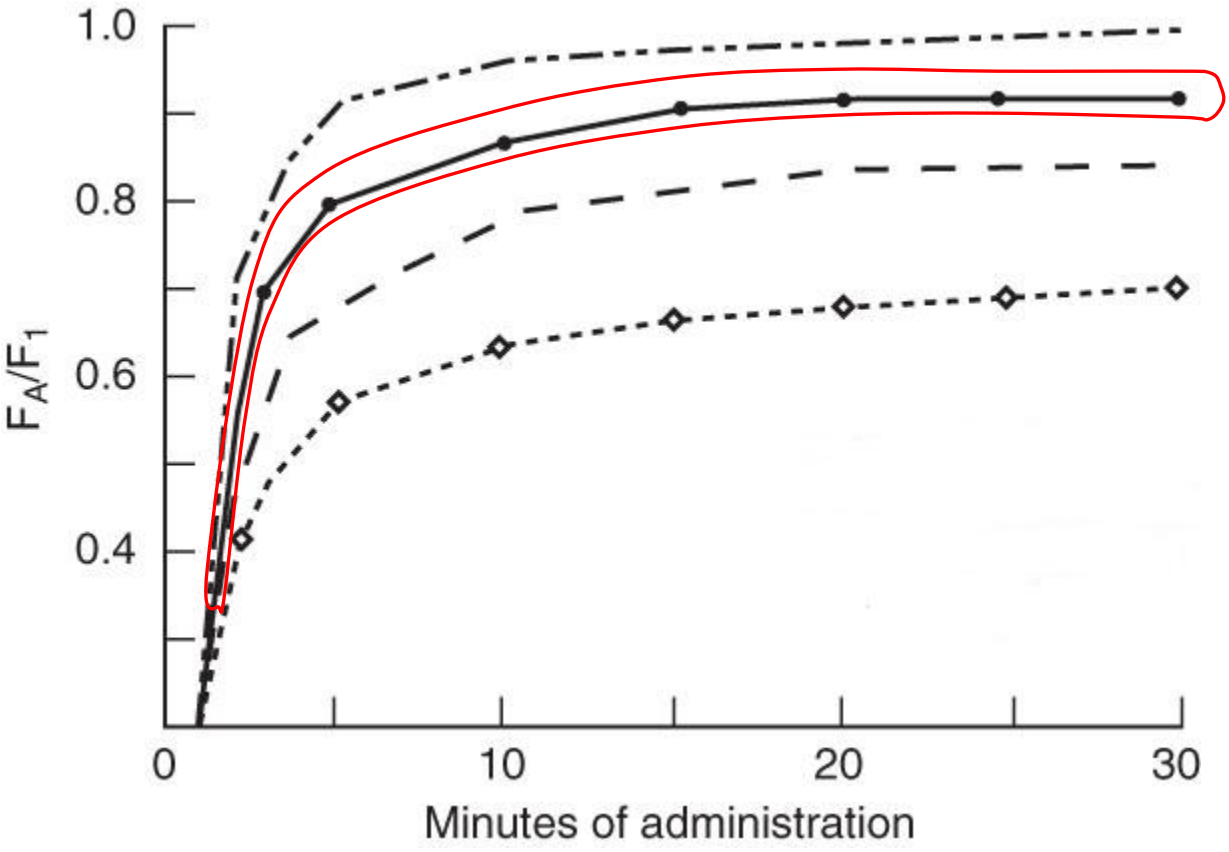


8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

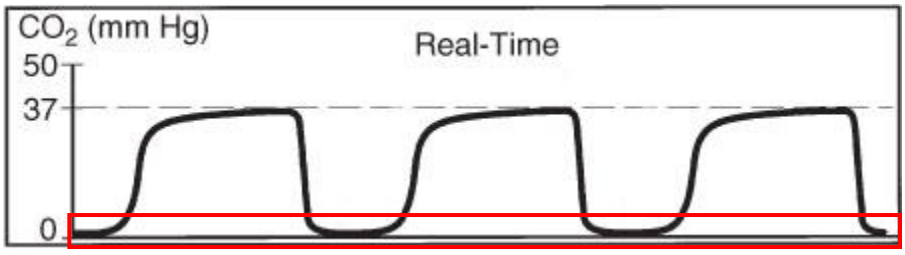
NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

7. The graph below depicts $F_A/F_1$ of isoflurane, sevoflurane, desflurane, and nitrous oxide. Click on the line that is characteristic of desflurane.



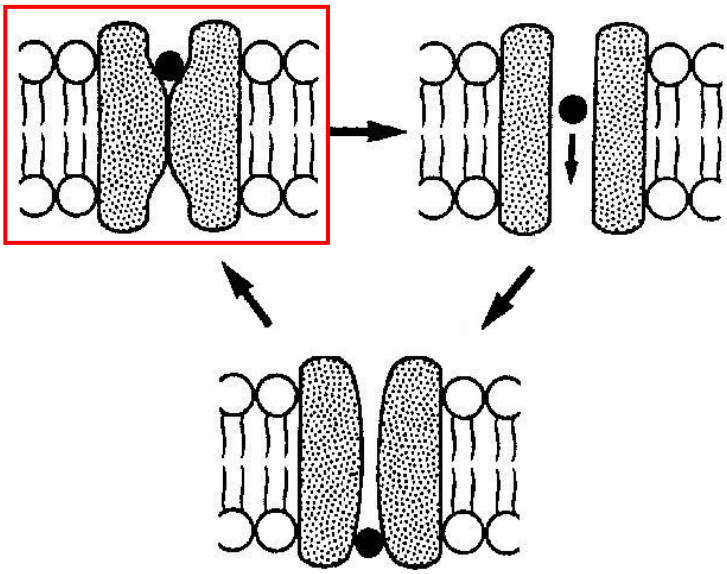

8. Below is a normal capnogram. Where on the graph would rebreathing be seen, if it were present?



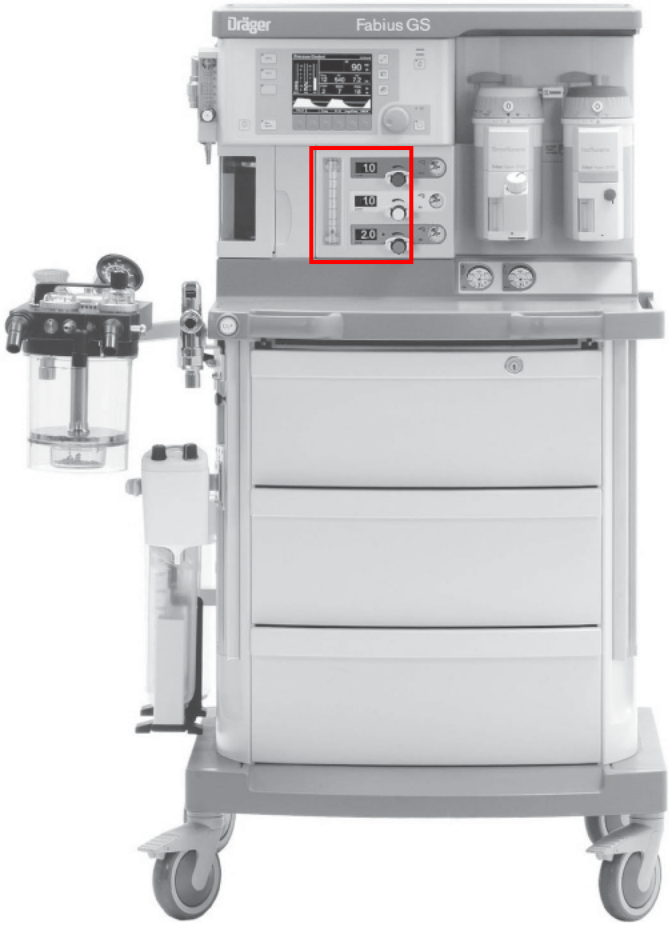



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631
NBCRNA
855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

9. Click the form of the neuronal sodium channel receptor to which binding by a local anesthetic is most difficult.



10. Designate the portion of the anesthesia delivery system which best signifies the beginning of the low pressure circuit.



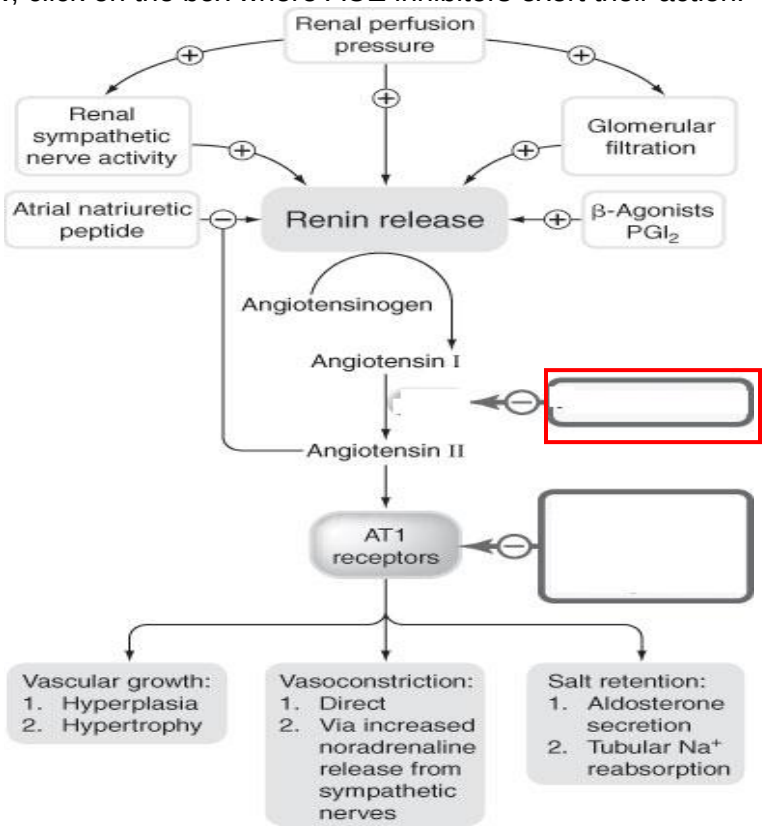



8725 W. Higgins Rd.
Suite 525
Chicago, IL 60631

NBCRNA

855-285-4658
www.NBCRNA.com
708-669-7636 :: fax

11. In the diagram below, click on the box where ACE inhibitors exert their action:




12. Click on the expiratory side of this circle circuit.