

Kevin's Review - 35 NCLEX Practice Questions

1. The nurse is evaluating the client who was admitted 8 hours ago for induction of labor. The following graph is noted on the monitor. Which action should be taken first by the nurse?

- A. Instruct the client to push
- B. Perform a vaginal exam
- C. Turn off the Pitocin infusion
- D. Place the client in a semi-Fowler's position

Correct Answer: C. Turn off the Pitocin infusion

The monitor indicates variable decelerations caused by cord compression. If Pitocin is infusing, the nurse should turn off the Pitocin.

- **Option A:** Instructing the client to push is incorrect because pushing could increase the decelerations and because the client is 8cm dilated, making answer A incorrect.
- **Options B and D:** Performing a vaginal exam should be done after turning off the Pitocin, and placing the client in a semi-Fowler's position is not appropriate for this situation.

2. The most serious adverse effect of tricyclic antidepressant (TCA) overdose is:

- A. Hyperpyrexia
- B. Cardiac arrhythmias
- C. Seizures
- D. Metabolic acidosis

Correct Answer: B. Cardiac arrhythmias.

Excessive ingestion of TCAs results in life-threatening wide QRS complex tachycardia. Tricyclic antidepressants act on approximately five different neurotransmitter pathways to achieve their effects. They block the reuptake of serotonin and norepinephrine in presynaptic terminals, which leads to increased concentration of these neurotransmitters in the synaptic cleft. The increased concentrations of norepinephrine and serotonin in the synapse likely contribute to its antidepressant effect.

- **Option A:** TCAs do not cause an elevation in body temperature. TCAs have varying degrees of receptor affinities, leading to several adverse effects. The most common adverse effects include constipation, dizziness, and xerostomia. Due to its blockade of cholinergic receptors, it can lead to blurred vision, constipation, xerostomia, confusion, urinary retention, and tachycardia.
- **Option C:** TCA overdose can induce seizures, but they are typically not life-threatening. There is evidence of TCAs increasing the risk of seizures in those with epilepsy, and use requires caution in this population.
- **Option D:** TCAs do not cause metabolic acidosis. Due to the blockade of alpha-1 adrenergic receptors, it can cause orthostatic hypotension and dizziness. TCA-induced histamine blockade (H1) may lead to sedation, increased appetite, weight gain, and confusion.

3. Which therapeutic communication technique is being used in this nurse-client interaction? Client: "When I am anxious, the only thing that calms

me down is alcohol.” Nurse: “Other than drinking, what alternatives have you explored to decrease anxiety?”

- A. Reflecting
- B. Making observations
- C. Formulating a plan of action
- D. Giving recognition

Correct Answer: C. Formulating a plan of action

The nurse is using the therapeutic communication technique of formulating a plan of action to help the client explore alternatives to drinking alcohol. The use of this technique, rather than direct confrontation regarding the client’s poor coping choice, may serve to prevent anger or anxiety from escalating.

- **Option A:** This therapeutic communication technique reflects and mirrors what the nurse believes the client’s feelings to be underneath the words. It mirrors, or reflects, the patient’s feelings, not words, back to the client so that the client’s feelings can be further explored and expressed by the patient.
- **Option B:** Making observations refers to verbalizing what the nurse perceives. For example, the nurse says, “You appear tense.” or “I notice you are biting your lip.” Sometimes clients cannot verbalize or make themselves understood. Or the client may not be ready to talk.
- **Option D:** Recognition, acknowledgment, and acceptance of the client and their thoughts which are conveyed during communication are therapeutic communication techniques and strategies that give the nurse the opportunity to let the client know that you are interested in them and respectful of them and their thoughts. It also allows the client to recognize that the nurse is open, honest and without any bias or judgements.

4. Septal involvement occurs in which type of cardiomyopathy?

- A. Congestive
- B. Dilated
- C. Hypertrophic
- D. Restrictive

Correct Answer: C. Hypertrophic

In hypertrophic cardiomyopathy, hypertrophy of the ventricular septum—not the ventricle chambers—is apparent. This abnormality isn’t seen in other types of cardiomyopathy. Ventricular hypertrophy results in a dynamic pressure gradient across the left ventricular outflow tract (LVOT), which is associated with further narrowing during systole.

- **Option A:** Congestive cardiomyopathy is a clinical state in which an abnormality of ventricular myocardium results in impaired pump function and circulatory congestion. Multiple factors have been incriminated in the etiology and progression of the myocardial damage.
- **Option B:** Dilated Cardiomyopathy (DCM) is a disease of the heart muscle characterized by enlargement and dilation of one or both of the ventricles along with impaired contractility defined as left ventricular ejection fraction (LVEF) less than 40%. By definition, patients have systolic dysfunction and may or may not have overt symptoms of heart failure.

- **Option D:** Restrictive cardiomyopathy indicates constrictive pericarditis; the underlying cause is usually myocardial. There are several causes of restrictive cardiomyopathy, including infiltrative diseases, storage diseases, and a variety of systemic diseases. Infiltrative diseases are pathologies that lead to a build-up of a substance in the myocardium.

5. The principal goals of therapy for older patients who have poor glycemic control are:

- A. Enhancing the quality of life.
- B. Decreasing the chance of complications.
- C. Improving self-care through education.
- D. All of the above.

Correct Answer: D. All of the above.

Older adults with diabetes are at substantial risk for both acute and chronic microvascular and cardiovascular complications of the disease. More than 25% of the U.S. population aged ≥65 years has diabetes, and the aging of the overall population is a significant driver of the diabetes epidemic.

- **Option A:** One of the principal goals of therapy for older persons with diabetes mellitus and poor glycemic control is enhancing the quality of life due to the decline in physical performance and an increased risk of poor health outcomes due to physiologic vulnerability to clinical, functional, or psychosocial stressors.
- **Option B:** Decreasing the chance of complications is another goal of therapy for older persons with diabetes because diabetes complications can lead to serious illness and even death, which is why prevention is so important.
- **Option C:** As with all patients with diabetes, diabetes self-management education and ongoing diabetes self-management support are vital components of diabetes care for older adults and their caregivers. Through good self-management, people with diabetes can better their quality of life and diminish the risk of developing complications. It can also help lower the number of hospital admissions, or make those times when they do need to go into hospital, for whatever reason, a better experience, with a reduced length of stay.

6. The manic client announces to everyone in the dayroom that a stripper is coming to perform this evening. When the nurse firmly states that this will not happen, the manic client becomes verbally abusive and threatens physical violence to the nurse. Based on the analysis of this situation, the nurse determines that the most appropriate action would be to:

- A. With assistance, escort the manic client to her room and administer Haldol as prescribed if needed.
- B. Tell the client that smoking privileges are revoked for 24 hours.
- C. Orient the client to time, person, and place
- D. Tell the client that the behavior is not appropriate.

Correct Answer: A. With assistance, escort the manic client to her room and administer Haldol as prescribed if needed.

The client is at risk for injury to self and others and therefore should be escorted out of the dayroom. Antipsychotic medications are useful to manage the manic client. Hyperactive and agitated behavior usually responds to Haldol. Alert staff if a potential for seclusion appears imminent. Usual priority of interventions would be: firmly setting limits; chemical restraints (tranquilizers); and seclusions.

- **Option B:** Option B may increase the agitation that already exists in this client. Remain neutral as possible; Do not argue with the client. The client can use inconsistencies and value judgments as justification for arguing and escalating mania. Maintain a consistent approach, employ consistent expectations, and provide a structured environment. Clear and consistent limits and expectations minimize the potential for the client's manipulation of staff.
- **Option C:** Orientation will not halt the behavior. Use a calm and firm approach. Provides structure and control for a client who is out of control. Use short, simple, and brief explanations or statements. Short attention span limits understanding to small pieces of information. Chart, in nurse's notes, behaviors; interventions; what seemed to escalate agitation; what helped to calm agitation; when as-needed (PRN) medications were given and their effect; and what proved most helpful.
- **Option D:** Telling the client that the behavior is not appropriate already has been attempted by the nurse. Decrease environmental stimuli (e.g., by providing a calming environment or assigning a private room); helps decrease escalation of anxiety and manic symptoms.

7. Mario is admitted to the emergency room with drug-included anxiety related to over ingestion of prescribed antipsychotic medication. The most important piece of information the nurse in charge should obtain initially is the:

- A. Length of time on the med.
- B. Name of the ingested medication & the amount ingested.
- C. Reason for the suicide attempt.
- D. Name of the nearest relative & their phone number.

Correct Answer: B. Name of the ingested medication & the amount ingested.

In an emergency, lives saving facts are obtained first. The name and the amount of medication ingested are of utmost important in treating this potentially life-threatening situation. Second-generation antipsychotics carry the FDA boxed warning of increased incidence of stroke in elderly patients with dementia. The recommendation is to avoid the use of second-generation antipsychotics along with other drugs that prolong the QTc interval.

- **Option A:** All dopamine receptor antagonists are available and can be administered in oral form. Except for thioridazine, pimozide, and molindone, all other first-generation antipsychotics can also be given parenterally. Haloperidol and fluphenazine can be delivered in long-acting depot parenteral form.
- **Option B:** Some antipsychotics can be monitored for a plasma therapeutic range. It is recommended to monitor plasma concentrations at a trough, which is at a minimum of 12 hours after the prior dose, and best at 20 to 24 hours after the last dose. Most antipsychotics do not have a well-defined dose-response curve.
- **Option D:** Antipsychotics are widely used medications for a variety of mental health disorders. While effective, these drugs do have many potential side effects. Healthcare workers, working as an interprofessional team, need to be aware of the adverse effects because they can seriously affect the quality of life. To avoid the metabolic effects of these drugs, the patient needs to receive

information regarding lifestyle changes. Regular exercise, discontinuation of smoking, and eating a healthy diet are essential.

8. The LPN is reviewing the lab results of an elderly client when she notes a urine specific gravity of 1.006. The nurse recognizes that:

- A. The client has impaired renal function
- B. The client has a normal specific gravity
- C. The client has mild dehydration
- D. The client has low sodium level in the blood

Correct Answer: B. The client has a normal specific gravity

- Option B: Urine specific gravity is a laboratory test that shows the density of urine compared with water. The normal specific gravity is 1.005-1.030.
- Option C: A specific gravity of 1.010 can indicate mild dehydration.
- Options A and D: Impaired renal function and hyponatremia will indicate decreased urine specific gravity.

9. The nurse is admitting a patient diagnosed with type 2 diabetes mellitus. The nurse should expect the following symptoms during an assessment, except:

- A. Hypoglycemia
- B. Frequent bruising
- C. Ketonuria
- D. Dry mouth

Correct answer: A. Hypoglycemia

Hypoglycemia does not occur in type 2 diabetes unless the patient is on insulin therapy or taking other diabetes medication. In T2DM, the response to insulin is diminished, and this is defined as insulin resistance. During this state, insulin is ineffective and is initially countered by an increase in insulin production to maintain glucose homeostasis, but over time, insulin production decreases, resulting in T2DM.

- **Option B:** Type 2 diabetes can affect blood circulation which makes it easier for the skin to bruise. Decreased blood flow to the area surrounding an injury prevents a wound from healing properly, resulting in the development of bruise-like lesions or spots.
- **Option C:** The presence of ketones in the urine happens due to a lack of available insulin. T1DM patients can often present with ketoacidosis (DKA) coma as the first manifestation in about 30% of patients.
- **Option D:** Losing a lot of fluids caused by frequent urination can lead to dehydration hence patients can develop dry mouth. People with diabetes are prone to dehydration. In those with diabetes, a person's blood glucose levels can become too high. The term for this is hyperglycemia, and it can cause a person to experience dry mouth.

10. While planning care for a 2-year-old hospitalized child, which situation would the nurse expect to most likely affect the behavior?

- A. Strange bed and surroundings.
- B. Separation from parents.
- C. Presence of other toddlers.
- D. Unfamiliar toys and games.

Correct Answer: B. Separation from parents

Separation anxiety is most evident from 6 months to 30 months of age. It is the greatest stress imposed on a toddler by hospitalization. If separation is avoided, young children have a tremendous capacity to withstand other stress.

- **Option A:** Most children, even school-aged children, are fearful of a strange bed and new surroundings.
- **Option C:** The presence of other toddlers might help the client calm down and adjust with the environment.
- **Option D:** Unfamiliar toys and games would least likely affect the toddler's behavior.

11. A 67-year-old male patient who recently had a permanent artificial pacemaker implanted is receiving education from the nurse about managing his health and lifestyle with the device. The patient enjoys an active lifestyle and is keen to understand what activities and precautions are necessary with his new pacemaker. He also uses various electrical appliances at home and is concerned about how they might affect his pacemaker. In this scenario, which piece of information provided by the nurse indicates a knowledge deficit regarding the management of a patient with an artificial cardiac pacemaker?

- A. "Take your pulse rate once a day, in the morning upon awakening."
- B. "You may use electrical appliances but maintain a safe distance from high-powered devices."
- C. "Regular follow-up care is important to ensure the pacemaker is functioning correctly."
- D. "You may engage in contact sports."

Correct Answer: D. may engage in contact sports

The client should be advised by the nurse to avoid contact sports. This will prevent trauma to the area of the pacemaker generator.

- **Option A:** The physician may advise to take and record the pulse rate often to gauge the heart rate. This allows comparison of the heart rate to the acceptable range to determine if the pacemaker is working effectively.
- **Option B:** Use of electrical appliances is allowed, but the client must maintain a distance from the appliances. Devices such as anti-theft systems, metal detectors, cell phones, mp3 players/headphones, radios, power-generating equipment, magnets, etc may interfere with a pacemaker.

- **Option C:** Modern pacemakers are built to last. Still, it needs to be checked periodically to assess the battery and find out how the wires are working, so it is a must to keep pacemaker checkup appointments.

12. A centrally located tumor would produce which of the following symptoms?

- A. Shoulder pain
- B. Pleuritic pain
- C. Coughing
- D. Hemoptysis

Correct Answer: C. Coughing

- **Option C:** Centrally located pulmonary tumors are found in the upper airway (vocal cords) and usually obstruct airflow, producing such symptoms as coughing, wheezing, and stridor.
- **Option A:** Pancoast tumors that occur in the apices may cause shoulder pain.
- **Option B:** As the tumor invades the pleural space, it may cause pleuritic pain.
- **Option D:** Small cell tumors tend to be located in the lower airways and often cause hemoptysis.

13. When attending a client with a head and neck trauma following a vehicular accident, the nurse's initial action is to?

- A. Provide oxygen therapy
- B. Initiate intravenous access
- C. Immobilize the cervical area
- D. Do oral and nasal suctioning

Correct Answer: C. Immobilize the cervical area

Clients with suspected or possible cervical spine injury must have their neck immobilized until formal assessment occurs. Maintain cervical spine spinal immobilization and minimize neck movement particularly during transport. Beware that absence of neurologic findings does not eliminate the possibility of spinal cord injury.

- **Option A:** Immediate measures are necessary to maintain breathing and hemodynamic stability, such as oxygen therapy. Hyperbaric oxygen (HBO) therapy has also been shown to exert neuroprotective effects when administered before or after SCI. Experimental studies have revealed various mechanisms that contribute to these neuroprotective effects, including improved spinal cord oxygen tension, decreased apoptosis, reduced inflammation, attenuation of oxidative stress, and improved angiogenesis and autophagy.
- **Option B:** Rapid infusion as quickly as possible of large volumes of crystalloids to restore blood volume and blood pressure is now the standard treatment for patients with combined traumatic brain injury and hemorrhagic shock. The final goal of fluid management is to optimize the circulatory system to ensure the sufficient delivery of oxygen to organs.
- **Option D:** Suctioning is also done after the cervical spine is immobilized. Patients with known or suspected cervical spine injury may require emergent intubation for airway protection and ventilatory support or elective intubation for surgery with or without rigid neck stabilization (i.e.,

halo).

14. The glycosylated hemoglobin of a 40-year-old client with diabetes mellitus is 2.5%. The nurse understands that:

- A. The client has good control of her diabetes
- B. The client has poor control of her diabetes
- C. The client can have a higher-calorie diet
- D. The client requires adjustment in her insulin dose

Correct Answer: A. The client has good control of her diabetes

- Option A: Glycosylated hemoglobin test or hemoglobin A1c measures the average blood glucose over the past 3 months. The normal range for people with diabetes with poor glucose control is less than 7% hence, a result of 2.5% means that the client's diabetes is well under control.
- Option B: The desired range for glycosylated hemoglobin in an adult client with poor glucose control is less than 7%
- Option C: A high caloric diet will lead to elevated glycosylated hemoglobin.
- Option D: The diet and insulin dose is appropriate for the client.

15. An ultrasound is performed on a client at term gestation that is experiencing moderate vaginal bleeding. The results of the ultrasound indicate that an abruptio placenta is present. Based on these findings, the nurse would prepare the client for:

- A. Complete bed rest for the remainder of the pregnancy.
- B. Delivery of the fetus.
- C. Strict monitoring of intake and output.
- D. The need for weekly monitoring of coagulation studies until the time of delivery.

Correct Answer: B. Delivery of the fetus.

The goal of management in abruptio placentae is to control the hemorrhage and deliver the fetus as soon as possible. Delivery is the treatment of choice if the fetus is at term gestation or if the bleeding is moderate to severe and the mother or fetus is in jeopardy.

- **Option A:** Placental abruption occurs when there is a compromise of the vascular structures supporting the placenta. In other words, the vascular networks connecting the uterine lining and the maternal side of the placenta are torn away. These vascular structures deliver oxygen and nutrients to the fetus. Disruption of the vascular network may occur when the vascular structures are compromised because of hypertension or substance use or by conditions that cause stretching the uterus. The uterus is a muscle and is elastic whereas the placenta is less elastic than the uterus.
- **Option C:** Evaluation of vital signs to detect tachycardia or hypotension, which may be indicators of a concealed hemorrhage are taken. Blood specimens such as a complete blood count (CBC), fibrinogen, clotting profile, and type and RH may be collected. These laboratory values will not aid in the diagnosis of placental abruption but will provide baseline data against which to evaluate the patient's condition over time.

- **Option D:** Women classified with a class 1 or mild placental abruption and no signs of maternal or fetal distress and a pregnancy less than 37 weeks gestation may be managed conservatively. These patients are usually admitted to the obstetrical unit for close monitoring of maternal and fetus status. Intravenous access and blood work for type and crossmatch is part of the plan of care. The maternal-fetal dyad will continue to be monitored until there is a change in condition or until fetal maturity is reached.

16. The nurse is aware that the patients who are allergic to intravenous contrast media are usually also allergic to which of the following products?

- A. Eggs.
- B. Shellfish.
- C. Soy.
- D. Acidic fruits.

Correct Answer: B. Shellfish

Some types of contrast media contain iodine as an ingredient. Shellfish also contain significant amounts of iodine. Therefore, a patient who is allergic to iodine will exhibit an allergic response to both iodine-containing contrast media and shellfish. Fish and shellfish contain iodine, and allergic reactions to seafood are quite common, with a prevalence ranging anywhere between 2% and 6% of the population. As a result, patients with suspected shellfish allergies are often told by providers that they are allergic to iodine. In 1 study, nearly 92% of patients presenting to a pediatrics clinic with a suspected seafood or shellfish allergy cited iodine as the culprit.

- **Option A:** As contrast-enhanced CT scans utilize a variety of iodine-based agents, patients are often told to avoid CT scans with iodinated contrast agents or receive corticosteroid/antihistamine premedications prior to undergoing CT scans to mitigate potentially life-threatening allergic reactions.
- **Option C:** A survey of radiologists and interventional cardiologists revealed that 65.3% and 88.9%, respectively, asked about seafood or shellfish allergies prior to administering contrast-enhanced CT scans, and 34.7% and 50.0%, respectively, stated that they would withhold contrast media or recommend premedication with corticosteroid/antihistamines for patients with seafood or shellfish allergy.
- **Option D:** Although fish and shellfish contain iodine, so do a wide variety of commonly consumed foods (eg, yogurt, milk, bread). In addition, our bodies contain and require sufficient quantities of iodine for basic functions, making immune reactions to such an essential ingredient of life unlikely. Instead, fish and shellfish contain proteins (parvalbumin and tropomyosins, respectively), which act as the major allergens, not iodine.

17. Which signs cause the nurse to suspect cardiac tamponade after a client has cardiac surgery? Select all that apply.

- A. Tachycardia
- B. Hypertension
- C. Increased CVP
- D. Decreased urine output

E. Jugular vein distention

Correct Answers: A, C, & D

Cardiac tamponade is a medical or traumatic emergency that happens when enough fluid accumulates in the pericardial sac compressing the heart and leading to a decrease in cardiac output and shock. The diagnosis of cardiac tamponade is a clinical diagnosis that requires prompt recognition and treatment to prevent cardiovascular collapse and cardiac arrest.

- **Option A:** Blood in the pericardial sac compresses the heart so the ventricles cannot fill; this leads to a rapid thready pulse. Normally, a small, physiologic amount of fluid surrounds the heart within the pericardium. When the volume of fluid builds up fast enough, the chambers of the heart are compressed, and tamponade physiology develops rapidly with much smaller volumes.
- **Option B:** Tamponade causes hypotension and a narrowed pulse pressure. The fluid may be hemorrhagic, serosanguineous, or chylous. The underlying pathology behind cardiac tamponade is a decrease in the diastolic filling, which leads to a decreased cardiac output. One of the first compensatory signs is tachycardia to overcome the reduced output.
- **Option C:** As the tamponade increases, pressure on the heart interferes with the ejection of blood from the left ventricle, resulting in increased pressure on the right side of the heart, and systemic circulation. Patients with cardiac tamponade present similar to patients with other forms of cardiogenic or obstructive shock. They may endorse vague symptoms of chest pain, palpitations, shortness of breath, or in more severe cases, dizziness, syncope, and altered mental status.
- **Option D:** As the heart is more inefficient, there is a decrease in kidney perfusion and therefore urine output. When fluid compresses the heart and impairs filling, the interventricular septum bows toward the left ventricle during inspiration due to increased venous return to the right side of the heart. This further decreases the left ventricle leading to decreased left ventricular preload and stroke volume.
- **Option E:** The increased venous pressure caused JVD. The JVP tracing may reveal an absent 'y' descent due to the elevated intrapericardial pressure that prevents the filling of the ventricles. The classic physical findings in cardiac tamponade included in Beck's triad are hypotension, jugular venous distension, and muffled heart sounds.

18. Mr. Howard, a 45-year-old patient, presents to the dermatology clinic with concerns about progressive hair thinning. After discussing the potential causes, Dr. Smith delves deeper into the science behind hair growth and explains the stages of the hair growth cycle. During this conversation, Dr. Smith mentions a phase in which the hair follicle starts to shrink and gradually detaches from the hair bulb. This results in the cessation of hair growth and ultimately leads to the hair strand falling out. Which term from the given options best describes this transitional stage?

- A. Catagen
- B. Anagen
- C. Collagen
- D. Telogen

Correct Answer: A. Catagen

The catagen phase is the transitional phase of the hair growth cycle. During the catagen phase, the hair

follicle undergoes involution, or shrinkage, and begins to detach from the dermal papilla (hair bulb). This stage typically lasts a few weeks. Hair growth stops, and the hair strand is cut off from its nourishing blood supply. Over time, the hair eventually falls out.

- **Option B:** Anagen is the active growth phase of the hair follicle where new hair cells are rapidly produced at the hair bulb, resulting in the continuous lengthening of the hair shaft. This phase can last for several years, and the hair typically grows about half an inch (1.25 cm) per month during this period.
- **Option C:** Collagen is the most abundant protein in the human body and plays a crucial role in maintaining the skin's strength, structure, and elasticity. It forms a supportive framework for tissues and contributes to skin's firmness and resilience, but collagen production can decrease with age, leading to wrinkles and sagging skin.
- **Option D:** Telogen is the resting phase of the hair growth cycle, during which the hair follicle is no longer actively producing new hair cells. Hair in the telogen phase remains in place but is not growing, and this phase can last for several weeks to several months before the hair eventually falls out and is replaced by a new hair shaft in the anagen phase.

19. Mr. Wales, who underwent post-abdominal surgery, has a nasogastric tube. The nurse on duty notes that the nasogastric tube (NGT) is draining a large amount (900 cc in 2 hours) of coffee ground secretions. The client is not oriented to person, place, or time. The nurse contacts the attending physician and STAT ABGs are ordered. The results from the ABGs show pH 7.57, PaCO₂ 37 mmHg and HCO₃ 30 mEq/L. What is your assessment?

- A. Metabolic Acidosis, Uncompensated
- B. Metabolic Alkalosis, Uncompensated
- C. Respiratory Alkalosis, Uncompensated
- D. Metabolic Alkalosis, Partially Compensated

Correct Answer: B. Metabolic Alkalosis, Uncompensated

The postoperative client's ABG results show that he has metabolic alkalosis because of an increased pH and HCO₃. It is uncompensated due to the normal PaCO₂ which is within 35 to 45 mmHg.

20. While reviewing a client's chart, the nurse notices that the female client has myasthenia gravis. Which of the following statements about neuromuscular blocking agents is true for a client with this condition?

- A. The client may be less sensitive to the effects of a neuromuscular blocking agent.
- B. Succinylcholine shouldn't be used; pancuronium may be used in a lower dosage.
- C. Pancuronium shouldn't be used; succinylcholine may be used in a lower dosage.
- D. Pancuronium and succinylcholine both require cautious administration.

Correct Answer: D. Pancuronium and succinylcholine both require cautious administration.

The nurse must cautiously administer pancuronium, succinylcholine, and any other neuromuscular blocking agent to a client with myasthenia gravis. Patients on NMDA are usually in the intensive care

unit. Monitoring of patients on NMDA includes pulse oximetry for oxygen saturation, continuous end-tidal CO₂. The rise in the level of carbon dioxide might show the development of malignant hyperthermia.

- **Option A:** Such a client isn't less sensitive to the effects of a neuromuscular blocking agent. Succinylcholine administration correlates to a significant rise in the serum potassium. Therefore, it is recommended to avoid use of succinylcholine in patients with chronic renal disease, burn patients, patients with crush injuries, and rhabdomyolysis. Elevated potassium level can lead to fatal arrhythmia.
- **Option B:** Succinylcholine is also associated with bradycardia especially in the pediatric population. The stimulation of the nicotinic receptor activates a muscarinic receptor that produces bradycardia. The effect can be blunted by administering atropine or glycopyrrolate.
- **Option C:** Either succinylcholine or pancuronium can be administered in the usual adult dosage to a client with myasthenia gravis. When an electric impulse transmits along the motor neuron, it causes the release of acetylcholine (ACh) from the presynaptic membrane which travels across the synaptic cleft and acts on the nicotinic receptors on the postsynaptic membrane, causing muscle contraction.

21. A preoperative patient receives atropine before induction of anesthesia. The nurse caring for this patient understands that this agent is used to prevent:

- A. Anxiety.
- B. Bradycardia.
- C. Dry mouth.
- D. Hypertension.

Correct Answer: B. Bradycardia.

Atropine, an anticholinergic drug, is used as an adjunct to anesthesia to counter the effects of vagal stimulation, which is caused by surgical manipulations that trigger parasympathetic reflexes, resulting in bradycardia. Atropine is the first-line therapy (Class IIa) for symptomatic bradycardia in the absence of reversible causes. Treatments for bradydysrhythmias are indicated when there is a structural disease of the infra-nodal system or if the heart rate is less than 50 beats/min with unstable vital signs.

- **Option A:** Atropine is not anxiolytic. Acetylcholine works on three different receptors that merit attention in nerve agent poisonings. Atropine is only useful to counter muscarinic effects (pralidoxime and benzodiazepines act on the others). If there are local symptoms to the eyes or respiratory tract, atropine is not indicated. Intravenous (IV) atropine indications include patients with hypersalivation, bronchial secretions, or bradycardia.
- **Option C:** Atropine causes dry mouth and sometimes is used to minimize bronchial secretions. While atropine can be used independently for anti-salivation effects, it most commonly is secondary to anticholinergic or antimuscarinic poisoning, as discussed below. It is not formally recommended for routine use in controlled airways, though it can be used off-label for minimizing secretions in the intubated patient.
- **Option D:** Approximately 20% of bradydysrhythmias are due to endogenous cardiac electrical systems. The structural disease may or may not require resuscitation and should be closely monitored with medication and pacing readily available. If there is no improvement in the clinical state after repeat doses of atropine, additional treatments with atropine are unlikely to be effective. However, transient improvements with repeat dosing are an indication to continue treatment with atropine (which may exceed standard cumulative dosing maximums).

22. Drugs can cause adverse events in a patient. Bone marrow toxicity is one of the most frequent types of drug-induced toxicity. The most serious form of bone marrow toxicity is:

- A. Aplastic anemia.
- B. Thrombocytosis.
- C. Leukocytosis.
- D. Granulocytosis.

Correct Answer: A. Aplastic anemia.

Aplastic anemia is the result of a hypersensitivity reaction and is often irreversible. It leads to pancytopenia, a severe decrease in all cell types: red blood cells, white blood cells, and platelets. A reduced number of red blood cells causes hemoglobin to drop. A reduced number of white blood cells make the patient susceptible to infection. And, a reduced number of platelets cause the blood not to clot as easily. Treatment for mild cases is supportive. Transfusions may be necessary. Severe cases require a bone marrow transplant.

- **Option B:** Thrombocytosis is a condition in which there is an excessive number of platelets in the blood. Platelets are blood cells in plasma that stop bleeding by sticking together to form a clot. Too many platelets can lead to certain conditions, including stroke, heart attack, or a clot in the blood vessels.
- **Option C:** Leukocytosis refers to an increase in the total number of white blood cells (WBCs) due to any cause. From a practical standpoint, leukocytosis is traditionally classified according to the component of white cells that contribute to an increase in the total number of WBCs. Therefore, leukocytosis may be caused by an increase in (1) neutrophil count (ie, neutrophilia), (2) lymphocyte count (ie, lymphocytosis), (3) monocyte count (ie, monocytosis), (4) eosinophilic granulocyte count (ie, eosinophilia), (5) basophilic granulocyte count (ie, basophilia), or (6) immature cells (eg, blasts). A combination of any of the above may be involved.
- **Option D:** Granulocytosis occurs when there are too many granulocytes in the blood. It's a condition that's closely related to chronic myelogenous leukemia (CML) and other bone marrow disorders. Granulocytes are white blood cells that have small granules or particles.

23. During the history, which information from a 21-year-old client would indicate a risk for development of testicular cancer?

- A. Genital Herpes
- B. Hydrocele
- C. Measles
- D. Undescended testicle

Correct Answer: D. Undescended testicle

Undescended testicles make the client at high risk for testicular cancer. Mumps, inguinal hernia in childhood, orchitis, and testicular cancer in the contralateral testis are other predisposing factors. The risk of testicular cancer might be a little higher for men whose testicles stayed in the abdomen as opposed to one that has descended at least partway. If cancer does develop, it's usually in the

undescended testicle, but about 1 out of 4 cases occur in the normally descended testicle.

- **Option A:** While HPV infections are very common, cancer caused by HPV is not. Most people infected with HPV will not develop cancer-related to the infection. However, some people with long-lasting infections of high-risk types of HPV, are at risk of developing cancer.
- **Option B:** Hydroceles generally don't pose any threat to the testicles. They're usually painless and disappear without treatment. However, if the patient has scrotal swelling, he should see his doctor rule out other causes that are more harmful such as testicular cancer.
- **Option C:** Measles has a low death rate in healthy children and adults, and most people who contract the measles virus recover fully. The risk of complications is higher in the following groups: children under 5 years old. adults over 20 years old.

24. A cigarette vendor was brought to the emergency department of a hospital after she fell into the ground and hurt her left leg. She is noted to be tachycardic and tachypneic. Painkillers were carried out to lessen her pain. Suddenly, she started complaining that she is still in pain and now experiencing muscle cramps, tingling, and paraesthesia. Measurement of arterial blood gas reveals pH 7.6, PaO₂ 120 mm Hg, PaCO₂ 31 mm Hg, and HCO₃ 25 mmol/L. What does this mean?

- A. Respiratory Alkalosis, Uncompensated
- B. Respiratory Acidosis, Partially Compensated
- C. Metabolic Alkalosis, Uncompensated
- D. Metabolic Alkalosis, Partially Compensated

Correct Answer: A. Respiratory Alkalosis, Uncompensated

The primary disorder is acute respiratory alkalosis (low CO₂) due to the pain and anxiety causing her to hyperventilate. There has not been time for metabolic compensation.

25. Match the acid-base status of the following blood samples to the disorders in the given choices. (PaCO₂ values are in mm Hg and bicarbonate values in mmol/l). pH 7.39, PaCO₂ 59, HCO₃- 35

- A. Respiratory Acidosis, Uncompensated
- B. Metabolic Alkalosis, Uncompensated
- C. Respiratory Acidosis, Fully Compensated
- D. Metabolic Alkalosis, Partially Compensated

Correct Answer: C. Respiratory Acidosis, Fully Compensated

- Based on the given ABG values, pH is 7.39. For pH, the normal range is 7.35 to 7.45. So it is NORMAL.
- PaCO₂ is 59. The normal range for PaCO₂ is from 35 to 45. If PaCO₂ is above 45, it is acidosis. Based on the given ABG values, PaCO₂ is above 45, so it is considered ACIDOSIS.

- HCO₃⁻ is 35. The normal range for HCO₃ is from 22 to 26. If HCO₃ is above 26, it is alkalosis. Based on the given ABG values, HCO₃ is above 26, so it is considered ALKALOSIS.
- For these ABG values, pH is NORMAL but slightly acidic and lines up with PACO₂ which is RESPIRATORY. Therefore, this group of ABG values is considered RESPIRATORY ACIDOSIS.
- Lastly, it is FULLY COMPENSATED because pH is normal. It is considered fully compensated if pH is normal.

26. Which of the following best describes thrombophlebitis?

- A. Inflammation and clot formation that result when blood components combine to form an aggregate body.
- B. Inflammation and blood clots that eventually become lodged within the pulmonary blood vessels.
- C. Inflammation and blood clots that eventually become lodged within the femoral vein.
- D. Inflammation of the vascular endothelium with clot formation on the vessel wall.

Correct Answer: D. Inflammation of the vascular endothelium with clot formation on the vessel wall

Thrombophlebitis refers to an inflammation of the vascular endothelium with clot formation on the wall of the vessel.

- **Option A:** Blood components combining to form an aggregate body describe a thrombus or thrombosis
- **Option B:** Clots lodging in the pulmonary vasculature refers to pulmonary embolism. Pulmonary embolism usually arises from a thrombus that originates in the deep venous system of the lower extremities; however, it rarely also originates in the pelvic, renal, upper extremity veins, or the right heart chambers
- **Option C:** The femoral vein runs along the inside of the legs from the groin area downward. Femoral vein thrombosis refers to a blood clot present in those veins. These veins are superficial, or close to the surface of the skin, and are often more prone to blood clots than deeper veins.

27. The primary nurse asked a clinical nurse specialist (CNS) to consult on a difficult nursing problem. The primary nurse is obligated to:

- A. Implement the specialist's recommendations.
- B. Report the recommendations to the primary physician.
- C. Clarify the suggestions with the client and family members.
- D. Discuss and review advised strategies with CNS.

Correct Answer: D. Discuss and review advised strategies with CNS.

The primary nurse requested the consultation, it is important that they communicate and discuss recommendations. The primary nurse can then accept or reject the CNS recommendations. Effective clinical practice thus involves many instances where critical information must be accurately communicated. Team collaboration is essential.

- **Option A:** Some of the recommendations may not be appropriate for this client. The primary nurse would know this information. A consultation requires review of the recommendations, but not

immediate implementation. Collaboration in health care is defined as health care professionals assuming complementary roles and cooperatively working together, sharing responsibility for problem-solving, and making decisions to formulate and carry out plans for patient care

- **Option B:** This would be appropriate after first talking with the CNS about recommended changes in the plan of care and the rationale. Then the primary nurse should call the physician. Collaboration between physicians, nurses, and other health care professionals increases team members' awareness of each others' type of knowledge and skills, leading to continued improvement in decision making.
- **Option C:** The client and family do not have the knowledge to determine whether new strategies are appropriate or not. Better to wait until the new plan of care is agreed upon by the primary nurse and physician before talking with the client and/or family. A study determined that improved teamwork and communication are described by health care workers as among the most important factors in improving clinical effectiveness and job satisfaction.

28. Marina with acute renal failure moves into the diuretic phase after one week of therapy. During this phase the client must be assessed for signs of developing:

- A. Hypovolemia
- B. Renal failure
- C. Metabolic acidosis
- D. Hyperkalemia

Correct Answer: A. Hypovolemia

In the diuretic phase fluid retained during the oliguric phase is excreted and may reach 3 to 5 liters daily, hypovolemia may occur and fluids should be replaced. The diuretic stage usually lasts for 1-2 weeks but can persist longer. In this stage, an increase in urine output is noted and uremia begins to resolve as the kidney continues to heal.

- **Option B:** The client is already experiencing renal failure. In the initiating stage, which begins when the kidney is injured and lasts from hours to days, signs of renal impairment are present such as altered BUN and creatinine levels and decreased urine output. During this phase, the cause of acute renal failure is sought and treatment is initiated.
- **Option C:** Metabolic acidosis is caused by a build-up of too many acids in the blood. Differentiating between pre-renal azotemia and ATN can be difficult. In prerenal azotemia, urine output is diminished. In ATN, urine output may or may not be diminished. In pre-renal assaults, the urinalysis will show normal urinary sediment with hyaline or granular casts, high specific gravity, high osmolality, low urinary sodium and urea, and normal urine creatinine.
- **Option D:** People with chronic kidney disease have a high risk for hyperkalemia, due in part to the effects of kidney dysfunction on potassium homeostasis. Other complications can include cardiac arrest from hyperkalemia due to the decrease in urine output, elevated phosphorus levels due to impaired renal regulation of calcium and phosphates, metabolic acidosis due to decreases in excretion hydrogen ions, GI bleeding, and decreased nutritional status. In treating hyperkalemia, all sources of dietary potassium should be stopped and a low potassium diet prescribed.

30. A client has a positive reaction to the PPD test. The nurse correctly interprets this reaction to mean that the client has:

- A. Active TB
- B. Had contact with *Mycobacterium tuberculosis*.
- C. Developed a resistance to tubercle bacilli.
- D. Developed passive immunity to TB.

Correct Answer: B. Had contact with *Mycobacterium tuberculosis*.

A positive PPD test indicates that the client has been exposed to tubercle bacilli. Exposure does not necessarily mean that active disease exists. If the infection risk is very high, the PPD test need not be repeated. The positive PPD test is usually followed by TB symptom assessment, physical exam, and chest radiograph. If there are no TB symptoms and no evidence of active tuberculosis infection on physical exam and chest radiograph, the patient most likely has latent TB. The treatment of latent TB should be encouraged once detected.

- **Option A:** A person with active infection usually presents with symptoms of the part affected and constitutional symptoms such as unexplained weight loss, fever, fatigue, loss of appetite, and night sweats. The latent TB, however, is asymptomatic and non-infectious. Early diagnosis of active TB is crucial to managing the disease in time and preventing its spread. The latent TB infection is non-infectious and asymptomatic, with a significant worldwide prevalence (33%).
- **Option C:** The benefit to the PPD test is the rapid identification of the presence of TB infection and, thus, the rapid diagnosis of TB. Although sometimes the infection may not be active, the detection of latent TB allows for treatment and decreases the risk of progression to active TB. It is a very simple and inexpensive skin test (not routinely recommended).
- **Option D:** Some individual's ability to react to tuberculin antigen wanes over time, which results in a false-negative reaction. In individuals with very old tuberculosis infection (many years), sensitization to tuberculin is weak, and the PPD test may be a false negative. However, if a subsequent test is administered, the tuberculin PPD may stimulate the immune system.

31. After terminating the transfusion during a reaction, which action should the nurse immediately be taken next?

- A. Run a solution of 5% dextrose in water.
- B. Run normal saline at a keep-vein-open rate.
- C. Remove the IV line.
- D. Fast drip 200ml normal saline.

Correct Answer: B. Run normal saline at a keep-vein-open rate.

The nurse will infuse normal saline at a KVO rate to keep the patency of the IV line while waiting for further orders from the physician. A transfusion reaction evaluation request form typically is used to document signs and symptoms of a suspected reaction so that the blood bank can use this information, in conjunction with laboratory testing, to arrive at a likely diagnosis. The blood bag, along with the infusion set and anything else attached to the set, should be sent with the transfusion reaction evaluation request.

- **Option A:** IV solution containing dextrose will hemolyze the red cells. IV solution containing dextrose in water will hemolyze red cells. Only isotonic, calcium-free IV solutions should be added to, or come in contact with blood products. Calcium may bind with the citrate anticoagulant and promote clotting in the tubing. Excess glucose and/or dextrose causes hemolysis and shortens red

cell survival.

- **Option C:** The nurse will not remove the IV line because then there would be no IV access route. Transfusion reaction treatment varies with the reaction. Diphenhydramine and acetaminophen are some of the most commonly used drugs for treating mild allergic and febrile nonhemolytic reactions. For other reactions, expert consultation should be considered. In cases of acute hemolytic reaction, baseline laboratory tests should be performed and urine should be kept flowing, possibly with alkalinization.
- **Option D:** Doing a fast drip will potentially lead to congestion and is not done without the physician's order. Volume overload may require diuretics. TRALI is treated with oxygen and supportive care, which may involve intubation. Bacterial contamination may involve blood pressure support and antibiotics. Because anaphylaxis is treated emergently according to hospital protocol, usually with epinephrine and diphenhydramine, there may not be time for consultation until after the patient is stabilized.

32. Miley has been taking growth hormones for quite some time now. As a recipient of the agent, she should be aware that a side effect of growth hormone is:

- A. Increased tumor growth
- B. Soft tissue hypertrophy
- C. Dwarfism
- D. Hyperthyroidism

Correct Answer: A. Increased tumor growth

Growth hormone may increase the size of a tumor if one is present. In addition to the lack of evidence for effectiveness of human growth hormone in these proposed uses, it causes side effects such as diabetes, carpal tunnel syndrome, fluid retention, joint and muscle pain, and high blood pressure. Many of these side effects were seen in studies that used much higher doses of human growth hormone than are now used in elderly people, so there is hope that studies using lower doses alone or in combination with modest doses of anabolic steroids may show a positive ratio of benefits to side effects.

Hypothyroidism and soft tissue atrophy are the side effects. Dwarfism is the indication for therapy.

- **Option B:** Anabolic-androgenic steroids (AAS) and other hormones such as growth hormone (GH) and insulin-like growth factor-1 (IGF-1) have been shown to increase muscle mass in patients suffering from various diseases related to muscle atrophy.
- **Option C:** Recombinant human growth hormone therapy (rhGH) is an effective treatment for patients suffering from growth hormone deficiency. Early intervention can prevent short stature and the psychosocial stress associated with it.
- **Option D:** Hyperthyroidism is associated with increased serum IGF-I levels and marked alterations in the neuroregulation of GH secretion. These changes involve decreased GH responsiveness to GHRH at the pituitary level and, at the hypothalamic level, a lack of suppressive effect of an oral glucose load.

33. Match the acid-base status of the following blood samples to the disorders in the given choices. (PaCO_2 values are in mm Hg and bicarbonate values in mmol/l). pH 7.34, PaCO_2 24, HCO_3^- 20

- A. Respiratory Acidosis, Partially Compensated
- B. Metabolic Acidosis, Partially Compensated
- C. Metabolic Acidosis, Uncompensated
- D. Metabolic Alkalosis, Partially Compensated

Correct Answer: B. Metabolic Acidosis, Partially Compensated

- Based on the given ABG values, pH is 7.34. For pH, the normal range is 7.35 to 7.45. Any blood pH below 7.35 (7.34, 7.33, 7.32, and so on...) is ACIDOSIS.
- PaCO₂ is 24. The normal range for PaCO₂ is from 35 to 45. If PaCO₂ is below 35, it is alkalosis. Based on the given ABG values, PaCO₂ is below 35, so it is considered ALKALOSIS.
- HCO₃⁻ is 20. The normal range for HCO₃ is from 22 to 26. If HCO₃ is below 22, it is acidosis. Based on the given ABG values, HCO₃ is below 22, so it is considered ACIDOSIS.
- For these ABG values, pH is ACIDOSIS and lines up with HCO₃ which is METABOLIC. Therefore, this group of ABG values is considered METABOLIC ACIDOSIS.
- Lastly, it is PARTIALLY COMPENSATED because all three (3) values are abnormal. It is considered partially compensated if all three (3) values are abnormal.

34. Which measure would be least effective in preventing postpartum hemorrhage?

- A. Administer Methergine 0.2 mg every 6 hours for 4 doses as ordered.
- B. Encourage the woman to void every 2 hours.
- C. Massage the fundus every hour for the first 24 hours following birth.
- D. Teach the woman the importance of rest and nutrition to enhance healing.

Correct Answer: C. Massage the fundus every hour for the first 24 hours following birth.

The fundus should be massaged only when boggy or soft. Massaging a firm fundus could cause it to relax. Uterine atony refers to the corpus uteri myometrial cells inadequate contraction in response to endogenous oxytocin that is released in the course of delivery. It leads to postpartum hemorrhage as delivery of the placenta leaves disrupted spiral arteries which are uniquely void of musculature and dependent on contractions to mechanically squeeze them into a hemostatic state.

- **Option A:** Active management of the third stage includes uterine massage with concomitant sustained low-level traction on the umbilical cord. Simultaneous oxytocin infusion is helpful, although it is reasonable to defer it to after delivery of the placenta. Medications used for postpartum hemorrhage secondary to Uterine atony include the following: oxytocin (Pitocin) can be given IV 10 to 40 units per 1000 ml or 10 units intramuscularly (IM). The rapid undiluted infusion may cause hypotension; methylergonovine (Methergine) given IM 0.2 mg. Given every 2 to 4 hours. Should be avoided in patients with hypertension: misoprostol (Cytotec): 800 to 1000 mg placed rectally. May cause a low-grade fever. It has a delayed action.
- **Option B:** A fundus that is higher than 2 cm above the umbilicus may indicate a distended bladder or a uterus that is filled with blood. After delivery of a large infant, the fundal height can be slightly elevated, and this may be a normal finding. Assist the woman to empty her bladder. Catheterize only if the woman is unable to void and the bladder is distended. Once the bladder is empty, reevaluate the fundal height. Bladder distention, incomplete emptying, urine retention, and/or the inability to void may occur during the first few days postpartum. Within 12 hours of birth, changes in

hormone levels (decreased estrogen and oxytocin) occur resulting in diuresis. Measure and record urine output in the first 24 hours post-birth. A bladder scan can also be used at this time to assess for post-void residual.

- **Option D:** This is an effective measure to enhance and maintain contraction of the uterus and to facilitate healing. The nurse must be well versed in postpartum assessment and be able to identify subtle changes that could indicate a woman's deteriorating condition. Components of care should be standardized regardless of whether the recovery is done in a post-anesthesia care unit (PACU), a labor and delivery room, or a postpartum room.

35. During recovery from a cerebrovascular accident (CVA), a female client is given nothing by mouth, to help prevent aspiration. To determine when the client is ready for a liquid diet, the nurse assesses the client's swallowing ability once each shift. This assessment evaluates:

- A. Cranial nerves I and II.
- B. Cranial nerves III and V.
- C. Cranial nerves VI and VIII.
- D. Cranial nerves IX and X.

Correct Answer: D. Cranial nerves IX and X.

Swallowing is a motor function of cranial nerves IX and X. Cranial nerve IX (glossopharyngeal nerve), is responsible for motor (SVE) innervation of the stylopharyngeus and the pharyngeal constrictor muscles by the nucleus ambiguus. Damage to the recurrent laryngeal branch of the vagus nerve can result in vocal hoarseness or acute dyspnea with bilateral avulsion.

- **Option A:** Cranial nerves I, II, and VIII don't possess motor functions. Cranial nerve I, the olfactory nerve, is composed of special visceral afferents (SVA). Chemo-sensory receptors in the olfactory mucosal lining bind to odorant molecules and conduct a signal through the nerves traveling through the cribriform plate of the ethmoid bone to synapse on the neurons of the olfactory bulb within the cranial vault. Cranial nerve II, the optic nerve, conveys special somatic afferent (SSA) visual sensory information from the rods and cones retinal sensory receptors to the thalamus, especially the lateral geniculate nucleus (LGN), and the superior colliculus (SC). Cranial nerve III innervates most of the eye muscles, by splitting into a superior and an inferior branch to innervate the remaining three recti muscles, the inferior oblique, and the skeletal muscle component of levator palpebrae superiors.
- **Option B:** The motor functions of cranial nerve III include extraocular eye movement, eyelid elevation, and pupil constriction. Cranial nerve III innervates most of the eye muscles, by splitting into a superior and an inferior branch to innervate the remaining three recti muscles, the inferior oblique, and the skeletal muscle component of levator palpebrae superioris. While no autonomic fibers travel with the fifth cranial nerve as it exits the pons, parasympathetic fibers from the other mixed cranial nerves will join with peripheral branches of cranial nerve V to innervate their respective target structures, such as the lacrimal, parotid, submandibular, and sublingual glands.
- **Option C:** The motor function of cranial nerve V is chewing. Cranial nerve VI controls lateral eye movement. The abducens nerve innervates the lateral rectus muscles only; thereby this nerve can be tested by evaluating the abduction of the eye gaze. Cranial nerve VIII, the vestibulocochlear nerve, is responsible for the auditory sense and the vestibular sense of orientation of the head.