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Question: 1

A 64-year-old female presents to the emergency department with sudden-onset left-sided weakness and slurred speech that began two hours ago. Non-contrast computed tomography (CT) of the head reveals no hemorrhage. The attending physician suspects an ischemic stroke involving the right middle cerebral artery territory.

Which of the following cellular events is most likely occurring in the penumbra surrounding the infarct core at this time?

- A. Neuronal hyperpolarization due to increased ATP production
- B. Activation of voltage-gated calcium channels leading to excitotoxicity
- C. Restoration of ionic gradients and normal neuronal function
- D. Decreased glutamate release, preventing further neuronal injury

Answer: B

Explanation:

In the ischemic penumbra, reduced blood flow results in diminished oxygen and glucose delivery, leading to decreased ATP production. This energy deficit impairs the function of ion pumps, such as the Na^+/K^+ ATPase, causing neuronal depolarization. Depolarization opens voltage-gated calcium channels, allowing an influx of calcium ions into neurons. Elevated intracellular calcium triggers the release of excitatory neurotransmitters like glutamate into the extracellular space. Excessive glutamate further activates NMDA (N-methyl-D-aspartate) and AMPA (α -amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid) receptors, perpetuating calcium influx and leading to excitotoxicity, which contributes to neuronal injury and death.

In contrast, neuronal hyperpolarization due to increased ATP production is unlikely, as ischemia leads to ATP depletion and depolarization, not hyperpolarization.

Restoration of ionic gradients and normal neuronal function cannot occur without adequate ATP, which is lacking in the ischemic penumbra.

Decreased glutamate release preventing further neuronal injury does not occur. Instead, glutamate release is increased due to depolarization and impaired reuptake mechanisms, exacerbating neuronal damage.

Question: 2

A 70-year-old male is recovering at home following hospitalization for an ischemic stroke. He exhibits right-sided weakness and requires assistance with ambulation. The healthcare team is considering initiating home health services.

Which condition must the patient meet to qualify for home healthcare under Medicare guidelines?

- A. The patient must require skilled therapy services such as physical or occupational therapy.
- B. The patient must be homebound, meaning leaving home requires considerable effort or assistance.

- C. The patient must be enrolled in a Medicare Advantage Plan.
- D. The patient must require continuous 24-hour skilled nursing care.

Answer: B

Explanation:

To qualify for home healthcare services under Medicare, the patient must be considered homebound. This means leaving the home requires considerable and taxing effort, assistance from another person, or the use of a supportive device like a wheelchair or walker. Additionally, the patient must require skilled services (such as skilled nursing or therapy), but homebound status is the primary eligibility requirement. Without being classified as homebound, a patient does not qualify for Medicare home health benefits even if skilled services are needed.

Enrollment in a Medicare Advantage Plan is not necessary to access home health services. Patients with traditional Medicare coverage are also eligible if the criteria are met.

Medicare covers patients needing part-time or intermittent skilled nursing or therapy services. Patients requiring full 24-hour skilled care would need a different care setting, such as a nursing facility.

While needing skilled therapy services is a component of home health eligibility, it alone is insufficient. The patient must also be homebound to qualify for services under Medicare regulations.

Question: 3

A 41-year-old female presents with sudden-onset right-sided numbness and weakness, accompanied by expressive aphasia

a. She reports a history of similar episodes over the past year, each resolving within hours. She also notes experiencing severe headaches with visual disturbances, such as flashing lights, preceding these episodes. Neurological examination reveals mild right-sided weakness and difficulty finding words. Non-contrast head computed tomography (CT) is unremarkable.

What is the most appropriate next step in management?

- A. Refer for electroencephalography (EEG)
- B. Administer thrombolytic therapy
- C. Schedule carotid Doppler ultrasonography
- D. Initiate migraine prophylactic therapy and provide patient education

Answer: D

Explanation:

The patient's recurrent episodes of unilateral numbness, weakness, expressive aphasia, and visual disturbances preceding severe headaches are indicative of hemiplegic migraine, a subtype of migraine with aura that can mimic a stroke. Given the frequency and severity of her episodes, initiating prophylactic therapy to reduce the frequency and severity of attacks is appropriate. Patient education regarding migraine triggers and symptom management is also essential.

Administering thrombolytic therapy is contraindicated without evidence of acute ischemic stroke, especially given the patient's history of similar transient episodes and unremarkable imaging.

Scheduling carotid Doppler ultrasonography may be considered if there is suspicion of carotid artery disease, but the patient's symptoms are more consistent with hemiplegic migraine.

A referral for electroencephalography (EEG) could be useful if seizures are suspected, but the clinical presentation aligns more closely with hemiplegic migraine.

Question: 4

A 72-year-old male with a history of nonvalvular atrial fibrillation, managed with 75 mg twice daily dabigatran (Pradaxa), presents to the emergency department with sudden-onset left-sided weakness and a Glasgow Coma Scale (GCS) score of 10. A non-contrast computed tomography (CT) scan reveals a right basal ganglion intracerebral hemorrhage. Vital signs include blood pressure of 180/95 mmHg, heart rate of 88 bpm, and oxygen saturation of 96% on room air.

Which of the following actions should the nurse anticipate as the priority intervention?

- A. Give one unit of fresh frozen plasma and recheck coagulation labs
- B. Prepare to administer prothrombin complex concentrate 25 units/kg IV
- C. Take the patient to surgery because the risk of bleeding outweighs the benefit of immediate neurosurgical intervention.
- D. Prepare to administer idarucizumab in two boluses of 2.5 g IV before taking the patient to surgery

Answer: D

Explanation:

Idarucizumab (Praxbind) is the specific reversal agent for dabigatran, a direct thrombin inhibitor, and is indicated in cases of life-threatening or uncontrolled bleeding, such as intracerebral hemorrhage. The recommended administration is two consecutive 2.5 gram intravenous doses, totaling 5 grams. This reversal is essential before any surgical intervention to reduce the risk of continued bleeding and allow for safer neurosurgical management. Dabigatran is not responsive to vitamin K or plasma products, and idarucizumab rapidly neutralizes its anticoagulant effects, often within minutes, making it the appropriate intervention in this emergency setting.

Giving one unit of fresh frozen plasma and rechecking coagulation labs is inappropriate because fresh frozen plasma is used for reversing vitamin K antagonists like warfarin, not dabigatran. Additionally, it would not act quickly enough or effectively in this case.

Taking the patient to surgery because the risk of bleeding outweighs the benefit of immediate neurosurgical intervention is misleading. While surgery might be indicated, it should not occur before anticoagulation is reversed, as this would place the patient at high risk of uncontrolled intraoperative bleeding.

Prothrombin complex concentrate (PCC) is effective for reversing vitamin K antagonists like warfarin, and it is sometimes used off-label for reversing factor Xa inhibitors (like rivaroxaban or apixaban). However, dabigatran is a direct thrombin inhibitor, and PCC is not the recommended or most effective reversal agent for dabigatran.

Question: 5

A 65-year-old female is brought to the emergency department by her son due to sudden onset of slurred speech and right-sided weakness that began 45 minutes ago. Her blood glucose level is 42 mg/dL.

What is the most appropriate next step in the initial triage of this patient?

- A. Notify neurology for immediate bedside evaluation
- B. Correct the hypoglycemia and reassess neurological status
- C. Start oxygen via nasal cannula and insert two large-bore IVs
- D. Initiate a stroke alert and proceed to head CT

Answer: B

Explanation:

Hypoglycemia is a well-known stroke mimic. In this case, glucose correction is a priority and may fully reverse symptoms, confirming they are metabolic rather than neurologic in origin. This reassessment helps prevent unnecessary treatments such as thrombolytics, which carry risks if used inappropriately. While initiating a stroke alert and proceeding to head CT is standard for stroke triage, in the presence of severe hypoglycemia, the priority is correcting glucose first. If symptoms persist after normalization, then a stroke alert would be appropriate.

Starting oxygen via nasal cannula and inserting two large-bore IVs are supportive measures but are not the most immediate priority in this specific context. There's no indication that the patient is hypoxic or needs fluid resuscitation.

Neurology involvement is important, but the acute correction of a reversible cause (hypoglycemia) is a more time-sensitive and practical first step.

Question: 6

A 72-year-old male is being discharged after a hemorrhagic stroke. He expresses concern about preventing another stroke.

Which lifestyle modification should the nurse emphasize as most effective in reducing his risk?

- A. Adopting a low-sodium diet to manage blood pressure
- B. Wearing compression stockings to prevent lower extremity edema
- C. Using a walker at home to prevent falls during ambulation
- D. Attending a weekly stroke support group to stay motivated

Answer: A

Explanation:

Elevated blood pressure is the most significant modifiable risk factor for recurrent hemorrhagic stroke. Reducing dietary sodium ($\leq 2,400$ mg/d) is a cornerstone of non-pharmacologic hypertension management and has a well-established impact on reducing blood pressure levels. Patient education should include strategies for reading food labels, avoiding processed foods, and using herbs and spices as salt substitutes to enhance adherence and sustainability.

Wearing compression stockings is more relevant for venous thromboembolism prophylaxis and managing edema, not blood pressure control.

Using a walker may help reduce the risk of falls during recovery, but it doesn't address stroke recurrence.

Stroke support groups can provide emotional support and help patients stay engaged in recovery, yet they do not replace targeted interventions like dietary changes for stroke prevention.

Question: 7

A 70-year-old male with a history of hypertension and hyperlipidemia presents with sudden onset of right-sided weakness and difficulty speaking. A computed tomography (CT) scan reveals an occlusion in the left middle cerebral artery.

Which type of stroke is most consistent with these findings?

- A. Subarachnoid hemorrhage
- B. Ischemic stroke
- C. Transient ischemic attack
- D. Hemorrhagic stroke

Answer: B

Explanation:

The patient's sudden onset of right-sided weakness and speech difficulties, combined with imaging showing an occlusion in the left middle cerebral artery, is indicative of an ischemic stroke. Ischemic strokes occur when a blood clot or other obstruction blocks blood flow to the brain, leading to neurological deficits. In this case, the occlusion in the left middle cerebral artery has impaired blood flow to areas of the brain responsible for motor control and language, resulting in the observed symptoms. Hemorrhagic strokes, in contrast, result from bleeding into the brain tissue due to vessel rupture and often present with different clinical and imaging features.

A transient ischemic attack (TIA) involves temporary blockage of blood flow without permanent damage, and symptoms typically resolve within 24 hours.

A subarachnoid hemorrhage involves bleeding into the space surrounding the brain and usually presents with a sudden, severe headache.

Question: 8

Which of the following best explains the rationale for redefining transient ischemic attack (TIA) from a time-based to a tissue-based definition?

- A. The shift was made to simplify clinical guidelines for emergency departments.
- B. Patient-reported symptom duration is unreliable for diagnosis.
- C. The 24-hour time frame was insufficient for capturing all stroke events.
- D. Advanced imaging techniques have revealed that some brief neurological events previously classified as TIAs actually result in detectable brain infarction.

Answer: D

Explanation:

Historically, TIAs were defined by the resolution of neurological symptoms within 24 hours, under the assumption that such events did not cause permanent brain damage. However, with the advent of sensitive imaging modalities like diffusion-weighted magnetic resonance imaging (MRI), clinicians have discovered that even short-lived symptoms can be associated with permanent cerebral infarction. This

finding prompted a shift to a tissue-based definition, where a TIA is characterized by transient neurological dysfunction without evidence of acute infarction on imaging. This redefinition enhances diagnostic accuracy and ensures that patients with actual brain injury receive appropriate treatment and secondary prevention strategies.

That the 24-hour time frame was found to be insufficient for capturing all stroke events is misleading; the issue was not the duration but the presence of tissue damage irrespective of symptom resolution time.

Patient-reported symptom duration being unreliable for diagnosis is not the primary reason for the definition change; while patient history is important, the shift was driven by imaging findings.

The shift being made to simplify clinical guidelines for emergency departments is incorrect; the change actually adds complexity but improves diagnostic precision and patient care.

Question: 9

A patient recovering from a cerebellar stroke is noted to have an unsteady gait and poor coordination. The nurse is developing a fall prevention plan.

Which component is most essential to include in the care plan?

- A. Position furniture close together to provide environmental support during mobility
- B. Use bilateral side rails and a bed alarm system to prevent unassisted bed exits
- C. Supervise all ambulation activities and provide assistive devices as needed
- D. Support independent ambulation for short distances within the room to promote recovery

Answer: C

Explanation:

Patients recovering from cerebellar strokes often present with ataxia and impaired balance, placing them at high risk for falls. Nursing interventions should focus on supervised mobility, ideally incorporating gait belts or walkers, to allow safe physical engagement without increasing injury risk. Promoting structured and monitored activity is critical to rehabilitation while ensuring patient safety. Clustering furniture may seem helpful for support but can increase the risk of tripping and limit the patient's clear path for safe movement.

While fostering independence is important, even short unassisted ambulation attempts can lead to falls if coordination is compromised.

Relying on side rails and bed alarms may provide temporary physical barriers, but they are not a substitute for active fall prevention and could be misused as restraints.

Question: 10

A 77-year-old male recovering from an ischemic stroke is working with a multidisciplinary team to regain independence. The occupational therapist is focusing on activities of daily living (ADLs).

Which intervention would be most appropriate for this therapy session?

- A. Providing education on energy conservation techniques for daily activities
- B. Teaching the patient how to use adaptive equipment for dressing and grooming
- C. Assessing the patient's fine motor skills to determine grip strength

D. Conducting gait training exercises to improve balance and coordination

Answer: B

Explanation:

Occupational therapy focuses on helping stroke survivors regain independence in daily tasks such as dressing, grooming, and bathing. Adaptive equipment, such as button hooks, long-handled sponges, or one-handed dressing techniques, can enhance a patient's ability to perform these tasks despite motor impairments. Occupational therapy is a crucial part of stroke rehabilitation, particularly in promoting self-care and functional independence.

Gait training exercises fall under the scope of physical therapy, which specializes in mobility, balance, and walking rather than fine motor tasks or ADLs.

Energy conservation techniques are often addressed in occupational therapy for patients with conditions like multiple sclerosis or chronic fatigue syndrome; in stroke rehabilitation, the primary focus is on skill retraining for ADLs rather than energy management.

Assessing grip strength is useful but does not directly teach the patient how to complete ADLs. While grip strength influences dexterity, the goal of occupational therapy is to develop compensatory strategies to perform tasks effectively, even with weakness.

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