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Question: 1

What is Lhermitte's Sign?

- A. A sensation of dizziness
- B. A shocking sensation during neck flexion
- C. A loss of taste sensation
- D. A tingling in the hands

Answer: B

Explanation:

Lhermitte's sign is characterized by a specific sensation described as a "shocking" or "electric" feeling that occurs during neck flexion. This phenomenon is typically associated with irritation of the spinal cord, often seen in conditions such as multiple sclerosis or cervical spondylotic myelopathy. The mechanism involves a conduction disturbance in the spinal cord, particularly affecting the pathways that transmit sensory signals. When a person flexes their neck forward, this motion can stretch the spinal cord and the surrounding tissues, triggering the abnormal sensation. It does not manifest as dizziness, loss of taste, or isolated tingling in the hands; rather, it is a distinctive experience primarily tied to neck movement. Thus, identifying Lhermitte's sign accurately as the shocking sensation during neck flexion is critical for diagnosing underlying neurological conditions.

Question: 2

During a pre-op study, what can be done to reduce a patient's discomfort at the wrist while maintaining adequate stimulation?

- A. Increase the width of the pulse
- B. Decrease the number of repetitions
- C. Decrease the stimulation intensity
- D. Change the electrode type

Answer: B

Explanation:

Reducing a patient's discomfort at the wrist during a pre-operative study while ensuring adequate stimulation is crucial for patient safety and cooperation. Decreasing the number of repetitions is an effective approach because it minimizes the overall exposure time to the stimulation. When the frequency of the stimuli is reduced, the patient experiences less discomfort and fatigue, making the procedure more tolerable without sacrificing the quality of the data gathered. In this context, it's important to maintain a balance between patient comfort and the integrity of the neurophysiological assessment. Other choices could either lead to increased discomfort or affect the quality of the

stimulation needed for accurate measurements. For example, increasing the width of the pulse may not directly alleviate discomfort and, in some cases, can lead to stronger sensations. Similarly, decreasing the stimulation intensity might compromise the adequacy of the stimulation needed for clear results. Changing the electrode type could potentially introduce other variables affecting stimulation but may not directly reduce discomfort effectively. Thus, minimizing the number of repetitions stands out as the optimal strategy for enhancing patient comfort while still acquiring the necessary data.

Question: 3

During which type of surgery is the anterior vasculature of the spine at greatest risk?

- A. Posterior spine surgery
- B. Anterior surgery in the thoracic spine
- C. Spinal fusion surgery
- D. Minimally invasive spine surgery

Answer: B

Explanation:

The anterior vasculature of the spine is at greatest risk during anterior surgery in the thoracic spine due to the nature of the surgical approach in this area. When performing anterior thoracic spine surgery, the surgeon accesses the spine from the front of the body, often necessitating retraction or manipulation of the major blood vessels, such as the aorta and the vena cava. This close proximity to vital vascular structures significantly increases the risk of vascular injury or compromise during the procedure. Additionally, the thoracic spine region is confined by the rib cage, which includes critical vascular structures that can be inadvertently damaged during dissection or surgical manipulation. The anterior approach, while beneficial for various spinal conditions, inherently carries a higher risk for the anterior vasculature compared to other surgical approaches where these vessels are less directly involved. Understanding the anatomy and risk factors associated with different surgical approaches helps in minimizing potential complications during neurophysiological intraoperative monitoring.

Question: 4

Which muscle groups are most appropriately monitored for L5 and S1 nerve roots in sEMG?

- A. Abductors and Adductors
- B. PL (L5-S1) and Semimembranosus (L5-S2)
- C. Hamstrings and Quadriceps
- D. Gastrocnemius and Soleus

Answer: B

Explanation:

Monitoring the PL (Peroneus Longus) for L5-S1 and the Semimembranosus for L5-S2 in sEMG is particularly appropriate because these muscles are innervated by the corresponding nerves derived from the lumbar and sacral plexus. The L5 nerve root contributes to both the Peroneus Longus and

Semimembranosus muscles, making them excellent indicators for assessing the integrity of the L5 and S1 nerve roots during surgical procedures. The Peroneus Longus is involved in eversion of the foot and can provide insights into the function of the L5 nerve root as it is responsible for foot dorsiflexion and eversion, while the Semimembranosus, part of the hamstring group, corresponds well with the L5-S2 roots, reflecting their motor function. By monitoring these specific muscle groups, neuromonitoring can effectively detect any changes or compromises in neural function during surgery, ensuring patient safety and surgical efficacy. This level of specificity helps prevent injuries and functional impairments associated with these critical nerve roots.

Question: 5

When it comes to Etomidate, which statement is accurate?

- A. It acts as a NMDA antagonist
- B. It enhances MEP amplitude
- C. It is a GABA agonist
- D. It increases latency in SSEPs

Answer: C

Explanation:

Etomidate is classified as a GABA agonist, meaning it enhances the action of the neurotransmitter gamma-aminobutyric acid (GABA) at the GABA-A receptor. This increases the inhibitory effects within the central nervous system, leading to sedation and hypnosis, which is why Etomidate is commonly used for anesthesia induction. Its mechanism of action primarily revolves around modulation of GABA receptors rather than affecting NMDA receptors or decreasing muscle response amplitudes. While it does not act as an NMDA antagonist, it does not enhance motor evoked potential (MEP) amplitude and does not increase latency in somatosensory evoked potentials (SSEPs). Understanding the pharmacological action of Etomidate is crucial for intraoperative monitoring, especially regarding patient safety and the interpretation of neurophysiological signals during surgery.

Question: 6

What happens if SSEP responses show significant variability during monitoring?

- A. The procedure should continue as normal
- B. Re-evaluate electrode placement and stimulation parameters
- C. There is no need for concern
- D. Patient may require increased sedation

Answer: B

Explanation:

When SSEP (Somatosensory Evoked Potential) responses exhibit significant variability during monitoring, it is essential to re-evaluate electrode placement and stimulation parameters. This is because variability can indicate that the recordings may not be capturing the true neurophysiologic responses, which could

be due to improper electrode positioning, inadequate contact, or issues with the stimulation technique. Proper electrode placement is crucial for obtaining reliable SSEP responses, as inaccuracies can lead to misleading data that may not reflect the patient's neurological status. Additionally, if the stimulation parameters such as intensity, duration, or frequency are not optimized, this can contribute to inconsistencies in the responses. Ensuring these factors are correctly addressed helps in obtaining stable and accurate monitoring, which is vital for assessing the integrity of neural pathways during surgical procedures. Continuing the procedure without addressing the variability would not be advisable, as it could jeopardize patient safety and the quality of the monitoring being performed. Hence, review and correction of electrode and stimulation factors are vital steps in managing unexpected variability in SSEP responses.

Question: 7

What type of fibers are present in cranial nerves?

- A. Exclusively motor fibers
- B. Exclusively sensory fibers
- C. Mixed fibers: sensory/motor/both
- D. Only autonomic fibers

Answer: C

Explanation:

Cranial nerves are unique in their composition, with many of them containing a combination of sensory, motor, and sometimes autonomic fibers. This mixed composition allows cranial nerves to perform a variety of functions. For instance, some cranial nerves are responsible for sensory input, such as the optic nerve for vision, while others, like the facial nerve, have motor functions that control muscles of facial expression. Certain cranial nerves also play a role in autonomic functions, further emphasizing their mixed fiber nature. The presence of mixed fibers facilitates complex interactions between the cranial nerves and their target organs, enabling coordinated responses that are crucial for various bodily functions. Recognizing that cranial nerves can carry different types of fibers is essential for understanding their diverse roles in the nervous system and how they contribute to overall physiological processes.

Question: 8

What is the main source of airborne bacteria in the operating room?

- A. Medical equipment
- B. Exfoliated skin particles from OR staff
- C. Aseptic techniques
- D. Ventilation systems

Answer: B

Explanation:

The main source of airborne bacteria in the operating room is primarily exfoliated skin particles from OR staff. During surgical procedures, staff and personnel can shed skin cells, which can carry bacteria. These microscopic skin flakes can enter the air and potentially contaminate the sterile environment. This shedding becomes more significant in a space where procedures are taking place and where there is increased movement and activity. While medical equipment, ventilation systems, and the adherence to aseptic techniques can influence the overall sterility and bacterial load in the room, they do not serve as the primary sources of airborne bacteria like skin particles do. Medical equipment is typically sterilized and designed to minimize bacterial contamination, and ventilation systems are engineered to filter air and reduce airborne particles. Aseptic techniques are crucial for maintaining cleanliness but do not produce airborne bacteria on their own.

Question: 9

What should be done if subcortical responses remain stable while cortical responses decrease?

- A. Re-evaluate the surgical procedure
- B. Continue monitoring the subcortical responses
- C. Increase the frequency of monitoring
- D. Notify the patient's family

Answer: B

Explanation:

When subcortical responses remain stable while cortical responses decrease, it is crucial to continue monitoring the subcortical responses. This is because the stability of subcortical responses indicates that the deeper structures of the brain are still functioning appropriately, despite the potential disturbance reflected in the cortical signals. In the context of intraoperative monitoring, a decrease in cortical responses could suggest compromise in cortical integrity or function, but if subcortical signals are unaffected, this may help in determining the overall state of neurophysiological function during surgery. Continuing to monitor the subcortical responses allows for a clearer understanding of any physiological changes occurring as the surgical procedure progresses. This information can be vital for the surgical team, as it may influence their decisions about the procedure and patient safety. Also, being aware of stable subcortical activity offers reassurance that critical functions related to deeper brain structures are still intact, even when cortical responses are less reliable. The other choices involve actions that don't directly address the situation. Re-evaluating the surgical procedure might be considered if there are concerning trends, but continuing monitoring provides ongoing data that can inform such a decision. Increasing the frequency of monitoring could imply an oversight in current monitoring practices, which are already established.

Question: 10

How long is the post-stimulus recording window typically for SSEP?

- A. 5 ms
- B. 10 ms
- C. 20 ms

D. 30 ms

Answer: B

Explanation:

The post-stimulus recording window for Somatosensory Evoked Potentials (SSEP) is typically around 10 milliseconds. This time frame is crucial for capturing the early components of the SSEP waveform, which are primarily due to the rapid transmission of sensory information through the nervous system. The early peaks, such as N9, N13, P14, and N20, occur within this window and reflect the physiological responses along the sensory pathways. By recording within this timeframe, clinicians can effectively monitor the integrity of these pathways during surgical procedures, ensuring appropriate responses to stimuli and minimizing the risk of neural injury. This specific window allows for the optimal collection of critical data necessary for intraoperative monitoring.

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