



Neurological disease in Non-Neurosurgical procedures

NeuroAnesthesia Quiz # 67

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CONTENT OUTLINE

Please click on any of the following links to proceed to that question/topic.

[Question 1: Myasthenic crisis](#)

[Question 2: Neurofibromatosis Type 1](#)

[Question 3: Epilepsy](#)

[Question 4: Cerebral Palsy](#)

[Question 5: Huntington's disease](#)

QUESTION 1

After an elective thymectomy all are **EARLY** signs of myasthenic crisis **EXCEPT**:

Please click on any of the following links to proceed to that question/topic.

[A: Tachypnea with decreased tidal volumes](#)

[B: Use of accessory muscles](#)

[C: Arterial blood gas reflects hypercapnia and/or hypoxemia](#)

[D: Bulbar muscle weakness](#)

Sorry! Incorrect.

EXPLANATION

A: Tachypnea with decreased tidal volumes

This is true, although it is an early sign. In early myasthenia gravis exacerbation, there is an increase in respiratory rate with shallower tidal volume breaths. ABG at this stage may be notable for hypocapnia.

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EXPLANATION

B: Use of accessory muscles

This is true, although it is an early sign. Progressive use of accessory muscles precedes hypercapnia and/or hypoxemia on arterial blood gas.

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Great Job!! Correct.

EXPLANATION

C: Arterial blood gas reflects hypercapnia and/or hypoxemia

This is true, ABG changes are a late sign. Both arterial blood gas with hypercapnia and/or hypoxemia as well as hypoxia on pulse oximetry are late signs of acute respiratory failure due to myasthenia crisis.

The incidence of postoperative myasthenic crisis after thymectomy has been noted to range from 12%-34%. Risk factors include history of myasthenic crisis, preoperative bulbar weakness, preoperative serum acetylcholine receptor antibody levels > 100 nmol/Liter, and intraoperative blood loss of > 1 Liter.

Wendell LC, Levine JM. Myasthenic crisis. Neurohospitalist. 2011 Jan;1(1):16-22. doi: 10.1177/1941875210382918. PMID: 23983833; PMCID: PMC3726100.

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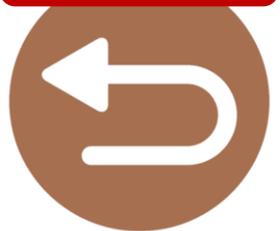
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EXPLANATION

D: Bulbar muscle weakness

This is true, although it is an early sign. Progression of bulbar or upper airway weakness can subsequently lead to hypercapnia and/or hypoxia on arterial blood gas.

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QUESTION 2

28 year old parturient with neurofibromatosis type 1 presents in labor.

Each of the following statements are true

EXCEPT:

Please click on any of the following links to proceed to that question/topic.

[A: Patient can have a difficult airway](#)

[B: Labor epidural can be safely administered](#)

[C: Pheochromocytoma and carcinoid tumors can be present.](#)

[D: Cerebrovascular disease could be present](#)

Sorry! Incorrect.

EXPLANATION

A: Patient can have a difficult airway

This is true and hence the choice is incorrect. Discrete and plexiform neurofibromas occurring in the cervical region and parapharyngeal space may result in distortion of the airway. Symptoms of dyspnea, hoarseness, or dysphagia should be taken as a warning for the anesthesiologist of potential airway problems. This would warrant evaluation by a specialist with indirect laryngoscopy and CT or MR imaging.

Hirsch N.P., Murphy A., and Radcliffe J.J.: Neurofibromatosis: clinical presentations and anaesthetic implications. Br J Anaesth 2001; 86: pp. 555-564

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Great Job!! Correct.

EXPLANATION

B: Labor epidural can be safely administered

Neurofibromatosis type 1 can be associated with spinal neurofibromas or scoliosis making neuraxial anesthesia challenging. In addition, the presence of raised intracranial pressure must be excluded before regional anesthesia is considered. Either CT or MRI may need to be considered, even given the radiation risk of CT.

Fox CJ, Tomajian S, Kaye AJ, Russo S, Abadie JV, Kaye AD. Perioperative management of neurofibromatosis type 1. *Ochsner J.* 2012 Summer;12(2):111-21.

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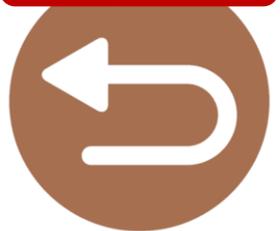
EXPLANATION

C: Pheochromocytoma and carcinoid tumors can be present.

This is true and hence the choice is incorrect. Neurofibromatosis type 1 are associated with neuroendocrine tumors, including pheochromocytomas and carcinoid tumors. Pheochromocytoma occurs in up to 5.7% of patients with NF1; the incidence of pheochromocytoma is as high 20–30% in patients with NF1 and hypertension.

Basile U, Cavallaro G, Polistena A, Giustini S, Orlando G, Cotesta D, Petramala L, Letizia C, Calvieri S, De Toma G. Gastrointestinal and retroperitoneal manifestations of type 1 neurofibromatosis. *J Gastrointest Surg.* 2010 Jan;14(1):186-94.

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Sorry! Incorrect.

EXPLANATION

D: Cerebrovascular disease could be present

Cerebrovascular disease has been reported . The most common disorder is a progressive narrowing of the internal carotid artery at the origin of the anterior and middle cerebral arteries like in Moyamoya.

Sobata E, Ohkuma H, Suzuki S. Cerebrovascular disorders associated with von Recklinghausen's neurofibromatosis: A case report. Neurosurgery 1988; 22: 544–9

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QUESTION 3

Which of the following is an **APPROPRIATE** preoperative guidance statement to provide to a patient with a history of epilepsy?

Please click on any of the following links to proceed to that question/topic.

[A: Risk of intraoperative seizures is negligible under general anesthesia.](#)

[B: Risk of postoperative seizures is negligible after general anesthesia.](#)

[C: Certain surgical procedures may increase risk of seizures in patients with epilepsy.](#)

[D: Preoperative sleep deprivation and alcohol intake would decrease the risk of perioperative seizures.](#)

Sorry! Incorrect.

EXPLANATION

A: Risk of intraoperative seizures is negligible under general anesthesia.

Incorrect. The general anesthetic administered during a surgical operation differs compared to general anesthesia for the treatment of status epilepticus. In the operating room, there exists the multiple risk factors that may lead to seizures including the physiologic stress of a surgical operation, metabolic derangements, hypoxia, hypotension, and drug interactions that may alter serum antiepileptic drugs levels. Patients with poorly controlled epilepsy are at higher risk of seizures in the perioperative period.

Carter EL, Adapa RM. Adult epilepsy and anaesthesia. *BJA Education*. 2015;15(3): 111–117.

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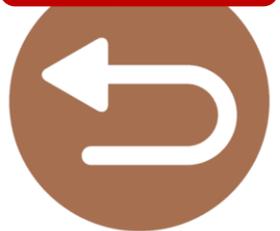
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EXPLANATION

B: Risk of postoperative seizures is negligible after general anesthesia.

Incorrect. Due to the complex medication regimen administered during general anesthesia and the physiologic stress during a surgical procedure, there are multiple pharmacokinetic and pharmacodynamic interactions that can alter serum concentrations of antiepileptic drugs.

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Great Job!! Correct.

EXPLANATION

C: Certain surgical procedures may increase risk of seizures in patients with epilepsy.

Correct. Certain procedures, such as neurosurgical procedures, increase the risk of perioperative seizures in patients with epilepsy.

Dhallu MS, Baiomi A, Biyyam M, Chilimuri S. Perioperative Management of Neurological Conditions. Health Serv Insights. 2017 Jun 12;10:1178632917711942.

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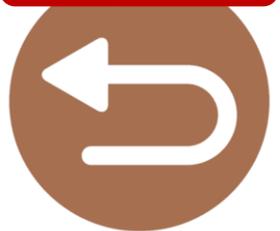
EXPLANATION

D: Preoperative sleep deprivation and alcohol intake would decrease the risk of perioperative seizures.

Preoperative sleep deprivation and alcohol intake increases the risk of perioperative seizures by lowering the seizure threshold in certain patients. This is not an appropriate recommendation.

Najjar S, Devinsky O, Rosenberg AD, et al. Procedures in epilepsy patients. In: Ettinger AB and Devinsky O, eds. Managing epilepsy and co-existing disorders. Boston: Butterworth-Heinemann; 2002;499–513.

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QUESTION 4

21 year old male with cerebral palsy presents to the PACU after hip osteotomy under general anesthesia.

The following is true regarding his lung function **EXCEPT**:

Please click on any of the following links to proceed to that question/topic.

[A: Restrictive lung disease](#)

[B: Increased respiratory muscle strength due to spasticity](#)

[C: Obstructive sleep apnea](#)

[D: Increased aspiration risk](#)

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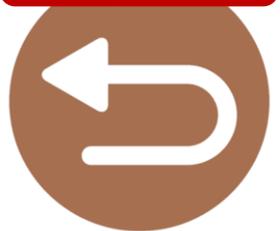
EXPLANATION

A: Restrictive lung disease

Patients with cerebral palsy can have restrictive lung disease hence this choice is incorrect.

Lampe R, Blumenstein T, Turova V, Alves-Pinto A. Lung vital capacity and oxygen saturation in adults with cerebral palsy. Patient Prefer Adherence. 2014 Dec 9;8:1691-7.

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Great Job!! Correct.

EXPLANATION

B: Increased respiratory muscle strength due to spasticity

Although there could be spasticity of muscles, the respiratory muscle strength is decreased not increased.

Marpole R, Blackmore AM, Gibson N, Cooper MS, Langdon K, Wilson AC. Evaluation and Management of Respiratory Illness in Children With Cerebral Palsy. *Front Pediatr.* 2020 Jun 24;8:333.

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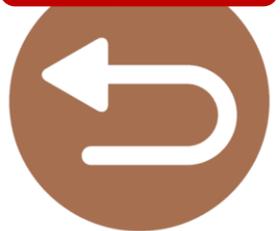
EXPLANATION

C: Obstructive sleep apnea

This is true. Obstructive sleep apnea and upper airway obstruction are common in cerebral palsy.

Marpole R, Blackmore AM, Gibson N, Cooper MS, Langdon K, Wilson AC. Evaluation and Management of Respiratory Illness in Children With Cerebral Palsy. *Front Pediatr.* 2020 Jun 24;8:333.

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Sorry! Incorrect.

EXPLANATION

D: Increased aspiration risk

Patients with cerebral palsy do have increased risk of aspiration due to oropharyngeal dysphagia and/or from gastroesophageal reflux.

Marpole R, Blackmore AM, Gibson N, Cooper MS, Langdon K, Wilson AC. Evaluation and Management of Respiratory Illness in Children With Cerebral Palsy. *Front Pediatr.* 2020 Jun 24;8:333.

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QUESTION 5

45 year old obese male with Huntington's disease presents for an elective total knee replacement arthroplasty. His family is requesting "minimal anesthesia" for him.

Which of the following from the anesthetic standpoint is **INCORRECT**?

Please click on any of the following links to proceed to that question/topic.

[A: He has increased risk of aspiration.](#)

[B: Regional/neuraxial anesthesia can proceed without special considerations.](#)

[C: His psychiatric medication regimen may interact with general anesthesia.](#)

[D: He is at increased risk of cardiac dysautonomia and arrhythmias.](#)

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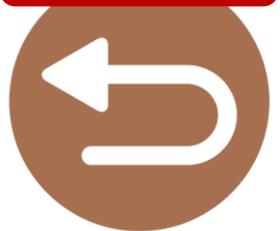
EXPLANATION

A: He has increased risk of aspiration.

Patients with Huntington's disease can have increased risk of aspiration, hypersalivation, and dysphagia.

Bachoud-Lévi AC, Ferreira J, Massart R, Yousov K, Rosser A, Busse M, Craufurd D, Reilmann R, De Michele G, Rae D, Squitieri F, Seppi K, Perrine C, Scherer-Gagou C, Audrey O, Verny C, Burgunder JM. International Guidelines for the Treatment of Huntington's Disease. *Front Neurol.* 2019;10:710.

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Great Job!! Correct.

EXPLANATION

B: Regional/neuraxial anesthesia can proceed without special considerations.

In Huntington's disease, chorea and behavioral changes make it difficult for patients to stay still and follow directions.

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Sorry! Incorrect.

EXPLANATION

C: His psychiatric medication regimen may interact with general anesthesia.

Patients with Huntington's disease often have complex psychiatric medication regimens including antipsychotics, antidepressants, benzodiazepines, and antiepileptic medications, all of which can interact with medications administered during general anesthesia.

Kivela J, Sprung J, Southorn PA, Watson JC, Weingarten TN. Anesthetic Management of Patients with Huntington Disease. *Anesthesia & Analgesia*. 2010;110(2):515-523.

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Sorry! Incorrect.

EXPLANATION

D: He is at increased risk of cardiac dysautonomia and arrhythmias.

Patients with Huntington's disease are at increased risk of cardiac dysautonomia and arrhythmias.

Abildtrup M, Shattock M. Cardiac Dysautonomia in Huntington's Disease. J Huntingtons Dis. 2013;2(3):251-61.

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