

Neuroanes quiz IO



# SNACC

SOCIETY FOR NEUROSCIENCE  
IN ANESTHESIOLOGY AND CRITICAL CARE

**Shaheen Shaikh, M.D. Assistant Professor of Anesthesiology,  
University of Massachusetts Medical center, Worcester, MA.**

**Shobana Rajan, M.D. Associate staff Anesthesiologist,  
Cleveland Clinic, Cleveland, Ohio**

**This quiz is being published on behalf of the Education  
Committee of the SNACC.**



**The authors have no financial interests to declare in this presentation.**





1. A 72-yr-old man with H/O Parkinson's disease ( PD) presents for deep brain stimulator ( DBS) placement. Contraindications for DBS include all of the following except,

---

A. Coagulopathy

B. Uncontrolled hypertension

C. Permanent pacemaker

D. Cognitive impairment

Go to Q 2



# A. Coagulopathy

---

- Coagulopathy can be associated with an increased risk of intracranial hemorrhage. Hence coagulopathy is a contraindication for DBS placement

Incorrect

Try again



## B. Uncontrolled hypertension

---

- Uncontrolled hypertension is also associated with an increased risk of bleeding. Intracranial hematoma can be life threatening. Gorgulho et al. found that SBP <140 mmHg was associated with lower risk of intracerebral hemorrhage.

*Ref: Gorgulho A, De Salles AA, Frighetto L, et al. Incidence of hemorrhage associated with electrophysiological studies performed using macroelectrodes and microelectrodes in functional neurosurgery. J Neurosurg 2005;102:888–96.*

Incorrect

Try again

Correct answer

## C. Permanent pacemaker



- A permanent pacemaker is not a contraindication for DBS placement., although precautions must be taken to limit possible DBS generator-PPM electrical interference

Back to the Question



Next Question





## D. Cognitive impairment

---

- Cognitive impairment is the one of the most frequent causes of exclusion for DBS placement. Cognitive changes after STN-DBS can occur in patients without preoperative cognitive impairment and worsening of pre existing cognitive impairment after DBS.
- Ref: Krack P, Batir A, et al. Five-year follow-up of bilateral stimulation of the subthalamic nucleus in advanced Parkinson's disease. *N Engl J Med* 2003;349(20):1925–34.

Incorrect

Try again

2. Intraoperative seizures during awake craniotomy for resection of seizure foci can be aborted by the following measures EXCEPT

---

A. Stop cortical mapping

B. Ice cold saline applied directly to the cortical surface

C. Propofol bolus

D. Phenytoin bolus

Go to Q 3





## A. Stop cortical mapping

---

- Most intra-operative seizures occur secondary to stimulation by cortical mapping. They are usually aborted by surgeon stopping the stimulus.

Incorrect

Try again

## B. Ice cold saline applied directly to the cortical surface

---

- Most seizures that occur intraoperatively can be stopped by applying ice cold saline directly on the cortical surface. Ice cold saline reduces the seizure threshold and aborts the seizures.

Incorrect

Try again



## C. Propofol bolus

---

Seizures that do not stop by application of cold saline or stopping the stimulation will need to be treated with small doses of benzodiazepines, propofol bolus or barbiturates.

Incorrect

Try again

Correct answer

## D. Phentyoin bolus



- Risk factors for intraoperative seizures include surgical stimulation, hemorrhage, edema and ischemia. Phenytoin should be given as an infusion not as a bolus. Most patients present for resection of seizure foci because their seizures are not controlled by anti-epileptic medications. Additional phenytoin will not be useful, but may increase side effects.

Back to the Question



Next Question





3. Resection of seizure foci may involve measurement of the following except:

---

A. EEG( electro-encephalography)

B. ECoG ( electro-corticography)

C MER( micro-electrode recording)

D. MEP( motor evoked potentials)

Go to Q 4



# A.EEG

---

- EEG is used commonly to diagnose seizures especially sub-clinical seizures.

Incorrect

Try again



## B. ECoG

---

- ECoG is used intraoperatively to reproduce as a seizure aura. In some patients subdural grids are placed. Postoperatively, a period of ictal electrocorticographic recordings and cortical stimulation delineate the site of seizure onset and functional anatomy.

Incorrect

Try again

Correct answer

## C. MER



- Micro electrode recordings are used during placement of DBS. The MER demonstrate changes in spontaneous neuronal firing as the electrode enters the nuclear or thalamic brain tissue. The MER guide lead placement in DBS.

Back to the Question



Next Question





## D. MEP

---

- Not used commonly. The seizure focus may lie in or near eloquent brain ( motor, sensory language, memory, vision). Mapping while the patient is awake is useful during surgical resection of intractable seizure foci and minimize resection of eloquent areas of the brain.
- If the patient is not awake, MEP may be used in the rare situation.

Incorrect

Try again

4. Indications for DBS include all of the following EXCEPT

---

- A. Essential tremor
- B. Parkinson's disease
- C. Major depression
- D. Migraine headaches

Go to Q 5





# A. Essential tremor

---

- Essential tremor may cause significant disability in otherwise healthy patients and significantly improves quality of life.
- DBS has been found to be very effective and received FDA approval in 1997.
- *Ondo W, Jankovich J, Schwartz K, et al. Unilateral thalamic deep brain stimulation for refractory essential tremor and Parkinson disease tremor. Neurology 1998;51:1063–9.*

Incorrect

Try again

## B. Parkinson's disease

- Idiopathic Parkinson's disease associated with tremor at rest, rigidity, postural instability and bradykinesia. In patients suffering from drug induced complications or those refractory to medications, electrical stimulation of the deep brain structures ameliorates these symptoms.
- *Kleiner-Fisman G, Fisman DN, Sime E et al. Long term follow-up of bilateral deep brain stimulation of the subthalamic nucleus stimulation in patients with advanced Parkinson's disease. J Neurosurg 2003; 99: 489-95*

Incorrect

Try again



## C. Major depression

---

- In studies done by Lozano et al, treatment resistant major depression responded favorably to subcallosal cingulate gyrus deep brain stimulation
- *Lozano AM, Mayberg HS, Giacobbe P et al. Subcallosal stimulation for treatment-resistant depression. Biol Psychiatry 2008; 64(6):461-7*

Incorrect

Try again

Correct answer

## D. Migraine headaches



- Current indications for DBS include essential tremor, idiopathic Parkinson's disease, dystonia. DBS is an emerging treatment in obsessive-compulsive disorder, refractory epilepsy, Tourette's syndrome, chronic pain, major depression and tremors( post stroke, post traumatic ) etc.
- Migraine headaches is not an indication for DBS placement.

Back to the Question



Next Question





5. A 72-yr-old man is undergoing DBS placement under MAC(monitored anesthesia care). Drugs to avoided include all EXCEPT

---

- A. Metoclopramide
- B. Meperidine
- C. Chlorpromazine
- D. Glycopyrrolate

Back to Q 1



# A. Metoclopramide

---

- Metoclopramide blocks dopamine receptors, may cause drug induced Parkinson's disease and must be avoided in this patient.

*Ref: Ganzini L, Casey D, Hoffman W, McCalli A. The prevalence of metoclopramide –induced tardive dyskinesia and acute extrapyramidal movement disorders. Arch Intern Med 1993; 153 (12) 1469-1475.*

Incorrect

Try again



## B. Meperidine

---

- Meperidine must be avoided in patients on MAOI inhibitors. Selegiline is used to treat Parkinson's disease is a MAOI-B type. Reports of agitation, muscle rigidity and hyperthermia have been described in patients on selegiline receiving meperidine.

Incorrect

Try again

## C. Chlorpromazine

---

- Chlorpromazine may exacerbate PD symptoms. PD patients have dopamine deficiency and cholinergic excitation. Chlorpromazine promotes cholinergic activity and worsens PD symptoms.

Incorrect

Try again



Correct answer

## D Glycopyrrolate



- Glycopyrrolate is the preferred anticholinergic drug of choice since it does not cross the blood brain barrier. Hence does not exacerbate PD symptoms.

End of set

Back to the Question



Back to Question 1

