

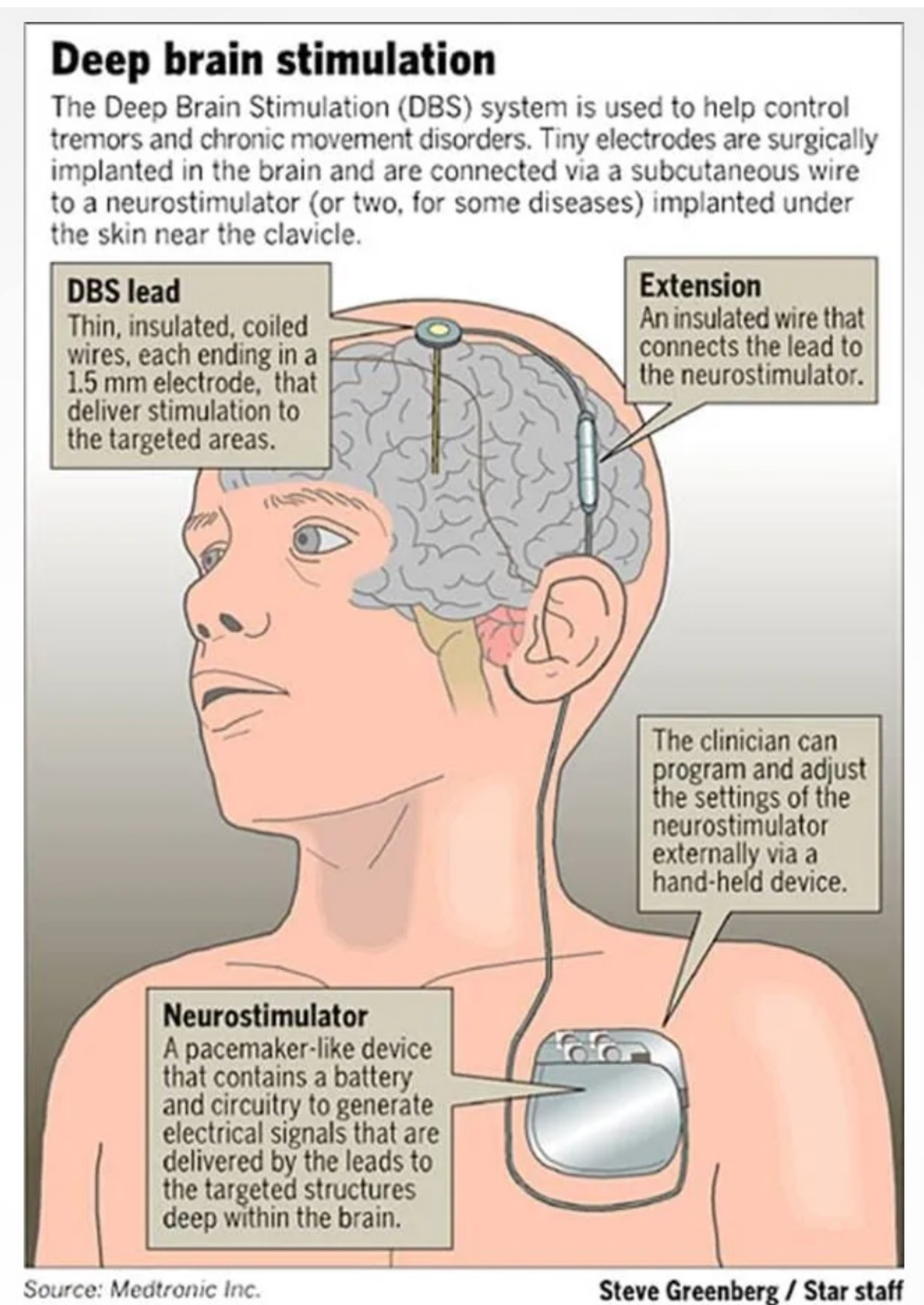
Deep Brain Stimulator Device Failure After Elective Cardioversion

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Introduction

Deep brain stimulators (DBS) are the most common surgically performed procedure for the treatment of Parkinson’s disease. They have become the basis for the treatment of movement disorders refractory to medical management. DBS devices mainly target the subthalamic nucleus & internal globus pallidus in order to alleviate motor fluctuations and dyskinesia in advanced Parkinson’s disease. DBS are considered to have a higher safety profile and have improvements in quality of life compared to previous treatments such as thalamotomy and pallidotomy. DBS devices involve intracranial electrodes along with an implantable pulse generator under the clavicle.



Case Report

A 53-year-old male presented for elective TEE and cardioversion for atrial fibrillation. His medical history was significant for Parkinson’s disease, with bilateral deep brain stimulator implantation and a recent generator change. As directed by the patient’s neurologist, the device was turned off pre-operatively. However following the cardioversion procedure, when the device was attempted to be turned back on in PACU, it was found to be nonfunctional. A manufacturer representative informed the procedural team that the proper management should have included a reprogramming to a special cardioversion setting instead. The patient was discharged home with instructions to follow up with his neurologist for generator change when possible. However, the next day the patient presented to the ED with severe tremors, rigidity, and worsening of his Parkinsonian symptoms. He underwent medication adjustment and eventually device replacement.

Table 3. DBS System considerations for cardioversion

Device type	Considerations for cardioversion
Percept PC	Ensure MRI mode is off. Program neurostimulator to 0.1 mA, 125 Hz, and 100 µs stimulation. Confirm all active electrode impedances are within a normal range. ^a
Percept RC	Ensure MRI mode is off. Turn off neurostimulator.
Activa PC	Turn off neurostimulator.
Activa RC	Turn off neurostimulator.
Activa SC	Turn off neurostimulator.

Discussion

This case demonstrates the importance of following the manufacturer algorithm when caring for patients with implanted devices. In this particular case, the manufacturer’s general guidelines recommended placing defibrillator paddles at a sufficient distance from the device in a perpendicular orientation, which was correctly done. The general guidelines also recommended turning the DBS device off for a cardioversion procedure.

However, this particular patient’s device was a unique model that needed to be switched to a special setting rather than being turned off. Therefore, in non-emergent situations, manufacturer representatives and movement disorder specialists should be consulted pre-operatively. When this is not done, it can lead to potentially dire consequences and worsen the patient’s underlying neurological conditions - causing increased morbidity and mortality in our patients.

References

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