

# Flat-Cut Bit for Cranial Perforator

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## Technology description

### Summary

Inventors at Vanderbilt have developed a novel perforating drill bit for DBS (deep brain stimulation) cranial surgery. DBS has become a technique for the treatment of movement disorders, as well as obsessive compulsive disorders and epilepsy. It is a very effective surgery involving implantable, programmable hardwires. This cranial drill bit significantly improves the process of preparing the periphery around the cranial punch during electrode implantation, one of the critical steps during DBS surgery. It saves OR time, prevents skin erosion, and perfects the looks of cosmetic appearance.

### Addressed Need

Manual preparation has the following drawbacks:

- Time consuming repetitive test mounting of the electrode cap
- Threat of irreparable skull damage from repeated fittings
- Labor intensive, as several instruments are required
- Electrode lead extrusion from the skin leads to erosion, which can cause infection

### Technology Description

This innovative drill bit, when used with a surgical drill, cuts cranial bone at a predetermined cutting depth, assuring a planar surface around the burr hole on the curved, irregular skull surface. A disposable product, this bit would be used around an existing perforation bore. It eliminates pretesting by counter boring the skull, allowing the electrode cap to be placed in precisely the right place. This counter boring also prevents disruption by the wearer by providing a smooth skull surface after the operation.

## Advantages

- Significantly reduces time of surgical site preparation
- Improves precision of electrode cap mounting
- Eliminates need for test mounting
- Improved stability of electrode cap mounting
- Prevents skin erosion due to cap/lead extrusion
- Ensures smooth layer of skin over cap, enhancing cosmetic appearance of the surgical site

## Institution

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