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Improved Lumbar Puncture And Epidural Accuracy

IP Status: US Patent Issued # 10,791,990

Related Technology: 20160374 Lung Biopsy

Electrical Impedance Guides Needle Placement

An innovative needle design uses electrical impedance to indicate when a lumbar puncture or epidural needle has reached its desired target. Because electrical properties of various biological tissues, bone or fluids differ, measuring their electrical conductivity and electrical permittivity properties can differentiate between them. The needle features electrodes that sense the electrical impedance properties of the tissue surrounding the needle and helps the user navigate the needle to its target area. Various electrical circuit configurations could measure impedance values and the device would indicate when the needle has reached certain areas (e.g., the ligamentum flavum, the epidural space or the intrathecal space). The device, with a disposable cannula/needle portion, could be used with current lumbar puncture kits and possibly combined with pre-existing needle designs.

Traumatic Lumbar Puncture Risk Reduced

Currently, lumbar punctures (as well as epidural administration) are done by feel, relying only on force or pressure. Such loss of resistance methods may result in the needle inadvertently hitting a cyst or the space between ligaments, making it especially difficult to know for certain when the needle is in the correct space, especially when trying to obtain cerebrospinal fluid (CSF). Traumatic lumbar punctures, associated with repeated removal of the needle to check for CSF, occur up to 30% of the time, with each additional puncture increasing risks to patients. Obese patients in particular are at higher risk, as they tend to require repeated lumbar punctures. This new device can determine when the needle has reached the CSF space (or other target area). While the needle is guided toward the target it can detect bone and help navigate the redirection of the needle. The proposed design would use an LED light to indicate when the needle has reached its target (i.e., when the needle detects the electrical properties of the desired area). This technology could reduce the number of traumatic lumbar punctures and increase accuracy of lumbar or epidural needle punctures.

BENEFITS AND FEATURES:

- Electrical impedance indicates when a lumbar puncture or epidural needle has reached its desired target
- Increases accuracy of lumbar or epidural needle punctures
- Reduces traumatic lumbar punctures
- Disposable cannula/needle
- Reduction in procedure time
- Reusable Detector possible

APPLICATIONS:

- Used with current lumbar puncture kits

Technology ID
20160281

Category
Life Sciences/Human Health
Life Sciences/Medical Devices

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- Could be combined with pre-existing needle designs

Phase of Development - Prototype dev

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