

PRODUCT

A novel Convection–enhanced delivery (CED) catheter design for introducing a bio-active agent into a patient's tissue under pressure so that the fluid moves through the tissue via bulk flow.

INDICATIONS

Drug delivery, brain tumors, medical device for delivering therapeutics to brain.

VALUE PROPOSITION

- Small diameter
- Self-priming or no-priming
- Multi-day or chronic use.

DEVELOPMENT STAGE

Proof of concept established.

INTELLECTUAL PROPERTY

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CONTACT INFORMATION

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Coaxial Catheter for Drug Delivery to the Brain and Other Organs

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PROBLEM

Convection–enhanced delivery (CED) is a delivery technique to bypass the blood brain barrier (BBB) and administer therapeutic agents directly into targeted brain parenchyma or tissue. A significant benefit of CED for the treatment of glioblastoma is its ability to deliver therapeutic agents into peritumoral region and beyond, substantially inhibiting the cancer recurrence and increasing survival. CED catheters can be difficult to place deep in the brain with high accuracy, in a manner that avoids the subsequent introduction of air bubbles into the flow channel. To reduce the risk of hemorrhage and/or trauma to the tissue, it is desirable for such a catheter to have a small outside diameter. It is also desirable to prevent the introduction of air into the tissue prior to the fluid reaching the tissue, which will help prevent backflow of fluid along the outside of the catheter. Additionally, current devices on the market or in development permit only short-term infusions.

SOLUTION

The inventor at Cleveland Clinic has curated a coaxial catheter invention that eliminates the introduction of air, while maintaining the ability to place the very small diameter catheter with high accuracy. This design utilizes a "dual-use" central lumen that accommodates for a rigid stylet and also allows for use of the same lumen for infusion. The first embodiment has a notched sidewall that extends into the lumen to create a channel for self-priming. In the second embodiment, a flexible membrane (red) attached to the sides of the lumen and a portion of the distal catheter near the open end. The membrane separates the central lumen into two parts, one for the stylet and one for the infusate. With the stylet in place, the membrane is pushed tightly against the wall thereby obliterating the infusate channel. Because of this dual-use design of the central lumen, the catheter itself does not need to be rigid and can be tunneled in the scalp for multi-day or even chronic use.

