Researchers at the University of South Florida have invented a novel catheter for direct delivery of therapeutics to the spinal cord in the treatment of various spinal cord pathologies.

Systemic intravenous administration of therapeutics provides limited cell or drug distribution within the spinal cord leading to diminished efficacy. Furthermore, systemic administration results in increased costs and risk of system toxicity due to the higher dosage amounts required. Current treatment of motor neuron disorders such as Amyotrophic Lateral Sclerosis, spinal cord injury, spinal cord stroke, or spinal ischemia is ineffective due to the non-selective, systemic, and often indirect nature of cell or drug delivery.

USF inventors have developed a novel 2 balloon catheter that allows selective, safe, effective, and non-invasive approach to treating specific spinal cord disorders. The catheter’s balloons can be placed with one near and one far from the segmental spinal arteries, inflating them to isolate the region. This, along with the injection port on the shaft between the balloons, allows for the precise and selective delivery of a therapeutic. This will allow the delivery of wide range of therapeutic agents such as pharmacologics, cells, gene therapies etc. Direct delivery of therapeutics into discrete regions of the spinal cord will improve outcomes in patients, as well as circumvent deleterious side effects associated with administered agents entering into extra-spinal cord organs. Localized delivery of therapeutics will also allow lower doses of therapeutics for effective treatment of the spinal cord.

**ADVANTAGES:**
- Novel 2 balloon catheter
- Less brain or systemic exposure
- Applicable to the treatment of multiple neurodegenerative disorders
- Improves delivery and enhances efficacy

**Targeted Delivery of Therapeutics to the Spine**

Fluoroscopic image of vertebral arteries of a rabbit with duel balloon catheter in place showing that the catheter isolated the artery.

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