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Controllable Guide-wire

Guidewires are used to navigate tortuous vessel anatomy and provide a stable guiding structure along which a catheter is advanced to its target within the body. Current guidewires come in a variety of stiffness for different applications; low stiffness wires enable easier steering and navigation and high stiffness wires enable stable catheter delivery without deformation. However, this tradeoff between steerability and stability means that one guidewire cannot fulfill both roles during many catheterization procedures. Because of this, guidewires need to be exchanged during a procedure, which exposes patients to additional trauma, potential infection, as well as increasing surgical procedure time and difficulty.

Inventors

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Researchers at Arizona State University have developed a new type of guidewire which can change its stiffness on command while in the body. This eliminates the need to exchange guidewires in the middle of a procedure. The design and properties of the guidewire are such that certain stimuli enact stiffness changes in a controllable manner. The guidewire has been tested in three point bending in order to validate predictions and evaluate actual flexural properties.

These novel guidewires with their advanced steering capabilities, as well as stiffness and stability needs for catheter placement, lower patient trauma and procedure time and help enable a more successful surgery.

Potential Applications

- Controllable guidewire
  - Catheter procedures: Heart valve replacements, coronary stents, etc.

Benefits and Advantages

- No need for guidewire changes
- Quicker procedure times
- Less trauma to patient vessels
- Less exposure to radiation for x-ray guided imaging

- Surgical procedures are simpler and easier for the surgeon
- Lessened risk for thrombus formation

For more information about the inventor(s) and their research, please see Dr. La Belle's laboratory webpage Dr. Santello's department webpage