Objectives

- Experimentally investigate the "rapid replanning as control" paradigm for needle steering around obstacles
- Create a needle with the steerability of a kinked tip, but which causes less tissue damage

Application

Liver vasculature and bile ducts are obstacles to be avoided during needle-delivered therapy.

Experiments

Homogeneous SimTest Material
- 28 Insertions, 9.5 – 12 cm deep
- Tip Error: 3.5 ± 2.6 mm

SimTest Material with Liver Vasculature Phantom
- 16 Insertions, 9.5 – 12 cm deep
- Tip Error 5.9 ± 2.6 mm

Duty Cycling Calibration

Tissue-Sparing Flexure Tip

Tip Length: 4.5 mm
OD: 0.87 mm ID: 0.60 mm

Tissue Damage Comparison

Liver vasculature and bile ducts are obstacles to be avoided during needle-delivered therapy.