

BIOENGINEERING

Fall 2019 Seminar

Date: Thursday, October 10, 2019
Time: 12:00 pm - 1:00pm
Location: Exploratory Hall, Room L111
(Videoconferencing to SciTech, K. Johnson Hall Rm 254)



Karun Sharma, Ph.D.

Biography: Karun Sharma, M.D., Ph.D., is the Director of Interventional Radiology at CNHS, and Associate Professor of Radiology and Pediatrics at George Washington University School of Medicine. He has built an active and integrated Interventional Radiology clinical service that is focused on advancing image-guided therapy. He also leads the Image-Guided Non-Invasive Therapeutic Energy (IGNITE) program, a collaboration of the Sheikh Zayed Institute and departments of Radiology, Oncology, Surgery, and Anesthesiology. The aim of the IGNITE

program is to improve the quality of life and outcomes for pediatric patients through development and clinical introduction of novel technologies and combination therapy approaches, with the ultimate goal of making pediatric surgery more precise, less invasive and pain-free. He leads several clinical trials focused on developing MR-guided interventions such as High Intensity Focused Ultrasound (HIFU) and MR-compatible robotic biopsy, both of which are now funded through NIH R01 grants.

Title: Clinical Application of MR-HIFU in Pediatrics

Abstract: Magnetic resonance imaging-guided high-intensity focused ultrasound (MR-HIFU) is a novel technology that integrates magnetic resonance imaging with therapeutic ultrasound. This unique approach provides a completely noninvasive method for precise thermal ablation of targeted tissues with real-time imaging feedback. Over the past 2 decades, MR-HIFU has shown clinical success in several adult applications ranging from treatment of painful bone metastases to uterine fibroids to prostate cancer and essential tremor. Although clinical experience in pediatrics is relatively small, the advantages of a completely noninvasive and radiation-free therapy are especially attractive to growing children. Unlike elderly patients, young children must deal with an entire lifetime of negative effects related to collateral tissue damage associated with invasive surgery, side effects of chemotherapy, and risk of secondary malignancy due to radiation exposure. These reasons provide a clear rationale and strong motivation to further advance clinical utility of MR-HIFU in pediatrics. We begin with an introduction to MR-HIFU technology and the clinical experience in adults. We then describe our early institutional experience in using MR-HIFU ablation to treat symptomatic benign, locally aggressive, and metastatic tumors in children and young adults. We also review some limitations and challenges encountered in treating pediatric patients and highlight additional pediatric applications which may be feasible in the near future.