Exponent®
Engineering & Scientific Consulting

Nadia Barakat, Ph.D.

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Professional Profile

Dr. Barakat leverages her training and experience in electrical and biomedical engineering to evaluate the risk and performance of active (battery-powered) medical devices in both wearable and implantable technologies. Additionally, with over 10 years of experience in clinical imaging, Dr. Barakat supports her clients in investigating the safety and performance of medical radiation sources (e.g., MRI, CT and X-ray) across a wide range of disciplines including adult and pediatric neurology, cardiology, and urology.

Her expertise includes designing clinical user studies, signal processing and interpretation of physiological data, as well as assessing safety and compatibility of active medical devices in magnetic resonance environments. Dr. Barakat assists clients in matters related to postmarket surveillance, regulatory submissions, risk management, failure analysis and intellectual property.

Prior to joining Exponent, Dr. Barakat was a scientist at Boston Children's Hospital and a faculty member at Harvard Medical School. She investigated the clinical utility of multimodal imaging in traumatic spinal cord injuries, multiple sclerosis, and rare autoimmune disease. She worked in protocol development, image processing/analysis, and biomarker identification. Dr. Barakat's research experience also includes brain-machine interfaces, as well as the study of Computer Adaptive Testing (CAT) platforms and their responsiveness to detect functional changes in children with cerebral palsy. She was a recipient of NIH research funding to study pediatric neuro-inflammatory disease, and was awarded the Derek Hardwood-Nash Award for best paper in pediatric neuroradiology by the American Society of Neuroradiology.

Academic Credentials & Professional Honors

Ph.D., Engineering, Temple University, 2012

M.S., Bioengineering, Temple University, 2009

B.S., Electrical Engineering, Temple University, 2006

Prior Experience

Instructor, Harvard Medical School, Boston, MA 2015-2020

Staff Scientist, Boston Children's Hospital, Boston, MA 2015-2020

Professional Affiliations

Member, Institute for Electrical and Electronics Engineers (IEEE)

Member, Siegel Rare Neuroimmune Association (SRNA)

Member, The International Society for Magnetic Resonance in Medicine (ISMRM)

Languages

Arabic

French

Publications

Manuscripts:

- Barakat N, Gorman MP, et al. “Pain and Spinal Cord Imaging Measures in Children with Demyelinating Disease”. NeuroImage: Clinical 2015, Sep 6;9:338-47.
- Barakat N, Shah P, et al. “Inter- and intra-rater reliability of diffusion tensor imaging parameters in the normal pediatric spinal cord”. World J Radiol 2015; 7(9): 279–285.
- Barakat N, Mohamed F, et al. “Diffusion Tensor Imaging of the Normal Pediatric Spinal Cord using an Inner Field of View Echo-Planar Imaging Sequence”. American Journal of Neuroradiology (AJNR). 2012; 33(6):1127-33.

Book chapter:

Mohamed F, Faro S, Barakat N. Chapter 8: "Advances in imaging”. Spinal Cord Injury in the Child and Young Adult [Lawrence Vogel]. Mac Keith Press. Publication date: January 2015.

Presentations

“Establishing a Relationship Between Pain and Spinal Cord Demyelination using Magnetization Transfer Imaging and Thermal Sensory Testing” The International Society for Magnetic Resonance in Medicine (ISMRM), 2019. Montreal, QC, Canada.

“Advanced imaging to better understand myelitis and pain in children and young adults”. Rare Neuro-Immune Disorders Symposium (RNDS), 2017. Boston, MA.

Research Grants

NIH/NICHD

K25 grant

Title: Advanced neuroimaging in pediatric spinal cord injury

Role: Principal Investigator