

**JOINT TANZANIAN NEURORADIOLOGY & 2nd
ISMRM AFRICAN CHAPTER CONFERENCE**

ABSTRACT FORMAT GUIDELINES

- 1. Synopsis - 100-word max (Introduction, Goal, Approach, Result)**
- 2. 4 keywords**
- 3. Main Body - 750-word max (Suggested headings: Introduction, Methods, Results, Discussion & Conclusion)**
- 4. Maximum 3 figures (submit each figure as a single .pdf file; include the caption as part of the figure)**
- 5. References**

**WRITE UP FOR THE 2ND ISMRM AFRICAN CHAPTER
CONFERENCE THEMES AND SUB THEMES TO BE POSTED
ON THE WEBSITE**

THEME: HEALTH INSIGHTS THROUGH MEDICAL IMAGING INNOVATIONS

The theme “Health Insights through imaging Innovations” for the 2nd ISMRM African chapter conference highlights the crucial role of innovations and technology in advancing Magnetic Resonance Imaging, Ultrasound, X-Ray and Computed Tomography imaging modalities. It underscores the transformative potential of cutting-edge imaging innovations in providing valuable insights into the diverse patient population, enabling early detection, accurate diagnosis, effective and precise treatment strategies.

In many regions of Africa, access to high-quality healthcare services and diagnostic tools is limited, contributing to significant health disparities. However, advancements in imaging the various imaging modality technologies, offer promising solutions to address these challenges.

Through this theme, the conference aims to showcase the latest developments in imaging technologies and their applications in diverse healthcare contexts of Africa. It provides a platform for researchers, clinicians, engineers, and policymakers to exchange knowledge, share best practices, and collaborate on innovative approaches to leveraging imaging for improved health outcomes across the continent.

SUB THEMES

SUBTHEME 1: MEDICAL IMAGING DEVICE DESIGN AND INNOVATIONS

The sub-theme "Medical Imaging Device-Design and Innovations" explores various engineering advancements aimed at transforming healthcare delivery and how innovative device design and technological breakthroughs have revolutionized medical imaging, making it more efficient, accessible, and affordable in Africa.

It delves into examples such as the development of portable imaging modalities, low-cost imaging solutions for rural areas, and the integration of artificial intelligence for enhanced diagnostic accuracy. These innovations not only improve imaging quality but also address challenges related to accessibility and cost-effectiveness, ultimately contributing to better healthcare outcomes across Africa.

SUBTHEME 2: AI AND MACHINE LEARNING IN MEDICAL IMAGING

This theme underscores the integration and transformative role of artificial intelligence and machine learning techniques in the development of innovative medical imaging devices and overall, revolutionizing medical imaging. This includes leveraging AI algorithms such as AI-driven image enhancement algorithms, predictive analytics for early disease detection, and personalized treatment planning based on patient-specific data. By harnessing the power of AI, researchers and engineers are revolutionizing medical imaging design to improve diagnostic accuracy, optimize workflow efficiency, and ultimately enhance patient care in diverse healthcare settings across Africa.

SUBTHEME 3: IMPROVING HEALTHCARE WITH MEDICAL IMAGING

This theme focuses on innovative strategies and advancements in medical imaging technologies aimed at addressing healthcare challenges, such as limited access to diagnostic tools and disparities in healthcare delivery. Solutions lead to enhancing the accessibility, accuracy, and effectiveness of medical imaging in diagnosing, treating, and managing various health conditions. Examples include the development of portable and cost-effective imaging solutions for underserved areas, the integration of advanced imaging modalities with point-of-care diagnostics, and the application of artificial intelligence and machine learning algorithms to streamline image interpretation and facilitate personalized medicine approaches.

SUBTHEME 4: ADVANCING UNDERSTANDING OF HEALTH AND DISEASE

This explores a multitude of innovative approaches in medical imaging modalities in deepening our comprehension of health and disease dynamics across the continent. It highlights the pivotal role cutting-edge research and innovative applications of imaging technologies aimed at unravelling the complexities of various health issues, including infectious diseases, non-

communicable diseases, and neurological disorders. It also includes leveraging medical imaging techniques to elucidate the pathophysiology of prevalent disease mechanisms, characterize disease progression, and identify biomarkers for early detection and intervention.

SUBTHEME 5: MULTIMODAL IMAGING

This explores a wide array of applications and the integration of various imaging modalities to provide comprehensive insights into health conditions and diseases prevalent across the continent. This captures the synergistic combination of techniques such as magnetic resonance imaging MRI with functional imaging techniques such as functional MRI (fMRI) and diffusion tensor imaging (DTI) to study brain connectivity and neural activity patterns in neurological disorders like epilepsy and Alzheimer's disease. It includes computed tomography (CT), x-ray, and ultrasound to enhance diagnostic accuracy, characterization, and treatment planning. It accounts for techniques like the utilization of hybrid imaging systems for oncological imaging, neuroimaging, cardiovascular imaging, and musculoskeletal imaging to achieve a more comprehensive understanding of complex diseases.

SUBTHEME 6: MEDICAL IMAGING ACCESSIBILITY

This showcases a range of initiatives and efforts to improve access to advanced medical imaging technologies and services across the continent. It focuses on addressing the disparities in healthcare access by developing innovative strategies and solutions to make imaging services more available and affordable, particularly in underserved and remote areas. This includes the development of portable and cost-effective imaging devices that require minimal infrastructure, such as portable ultrasound devices and smartphone-based diagnostic tools, to bring imaging capabilities to remote and resource-limited areas. Furthermore, the establishment of mobile imaging clinics to reach rural communities, and the utilization of telemedicine and remote imaging services to extend healthcare access beyond traditional healthcare facilities. Additionally, the conference explores policy initiatives, capacity-building efforts, and public-private partnerships aimed at enhancing infrastructure, training healthcare professionals, and increasing public awareness to ensure equitable access to medical imaging services throughout Africa.