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Nota di contenuto	Introduction by Editors -- Monitoring of Brain Function in Neurointensive Care -- Microwave Technology for Brain Imaging and Monitoring -- Microwave Imaging for Continuous Monitoring of Brain Stroke -- Electromagnetic Tomography for Brain Imaging and Stroke Diagnostics: Progress Towards Clinical -- Optical Tomography of the Brain -- Microwave Radiometry for Non-invasive Monitoring of Brain Temperature -- Magnetic Nanoparticle Hyperthermia -- Local Treatment of Brain Tumors and the Blood-Brain Barrier -- Towards Multispectral Multimodal Non-ionizing Diagnosis and Therapy.

The book presents an overview of emerging technologies making use of electromagnetic waves for diagnostics, monitoring and treatment of brain diseases. These innovative technologies offer exciting possibilities in the medical field, owing to their low-cost, portability and safety. Hence their contribution to reduce the mortality and permanent injuries is expected to become important in the future. The book will specifically address cerebrovascular diseases (such as stroke, ischemia, haemorrhage, vasospasm), which have an ever-increasing societal relevance of to the ageing of population, describing the potential of innovative techniques, such as microwave imaging. Moreover, it will present innovative modalities for treatment of brain tumours jointly using electromagnetic fields and nano-composites, as well as monitoring brain temperature during surgery. Finally it will address the perspectives that arise from multi-modal multi-spectral EM modalities, which make a synergic use of the different portions of the EM spectrum. All chapters in the book present examples of electromagnetic technologies and their applications to the diagnostic, the monitoring and the treatment of brain diseases, illustrating the capabilities, the experiments and the outcome of clinical trials. With the aim of making the book broadly accessible to interested scholars coming from different areas and experiences (which is expected, given the multi-disciplinarity of the subject), some chapters provide an insight in some fundamental aspects of the treated topic. For instance, the physiology of cerebrovascular diseases, the clinical challenges to be faced in neurointensive care and the emergent needs are revised. Also, the physics underlying the adoption of microwave technologies in diagnostics and monitoring, its potential as well as the limitations of this technology are revised. The book gathers contributions from the researchers with different background, thus a multidisciplinary and up-to-date overview of the state-of-the-art in this emerging field.
