

Preface

Every part of the human brain must be supplied with a sufficient and continuous supply of blood in order to maintain healthy function. Cerebral autoregulation, the means by which the brain achieves this, despite changes in other physiological variables such as blood pressure, is a highly complex mechanism. It has been widely implicated in a range of brain diseases, including stroke, stenosis and brain trauma and injury. With increasing clinical focus on brain disease, the importance of cerebral autoregulation has become more widely appreciated.

However, there is as yet no suitable overview of or introduction to the subject, despite the very substantial published literature; it is thus difficult to get a clear broad vision of this highly multidisciplinary field and to understand the key open questions. Studies are published in a very wide range of technical and clinical journals and the three most highly cited review papers were published in 1990, 1984 and 1998. No general book on cerebral autoregulation has yet been published, so there is no recent survey of the field that can be used by researchers working in this area or related fields.

The aim of this book is thus to provide an up-to-date review of the state of the art in cerebral autoregulation, providing the first such book in this field, covering all aspects of cerebral autoregulation, from the biological mechanisms to the clinical applications of advanced measurement and analysis techniques. This is particularly relevant as cerebral autoregulation starts to move from the laboratory to the bedside. The intention of this book is to provide an introduction to what is currently a very disparate field to the general scientific and clinical reader, whilst also giving a full coverage for the more specialist reader through the use of a comprehensive reference list. It is hoped that this will help to draw together the field and to assist researchers in setting out future directions with the current state of the art more clearly in mind, along the lines of the Cerebral Autoregulation Research Network (CARNet).¹

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¹<http://www.car-net.org>.

Cerebral Autoregulation

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