

**Improving Our Models: The Case for Monitoring Craniospinal Compliance Simultaneously to ICP and TCD Waveform Analysis. Considerations for the Design of a Multi-Centre Study**

*I. Piper, C. Contant, M. Czosnyka*

*Clinical Neurosciences, Western General Hospital, Edinburgh, UK*

*Department of Neurosurgery, Baylor College of Medicine, Houston, USA*

*Academic Neurosurgical Unit, Addenbrookes Hospital, Cambridge, UK.*

**Introduction:** Over the last twenty years there has been interest in studying the ICP waveform and, more recently, the MCA flow velocity waveform in order to provide information to help either predict raised ICP or the limits of cerebral blood flow autoregulation<sup>1,2,3</sup>. Despite much effort and a considerable number of publications, a good predictive model, based on waveform indices, has failed to materialise. Those working in this field agree that the models could be improved if data on compliance were obtained along side the data on the ICP and MCA flow velocity waveform. This is pertinent as it is known that pressure and flow transmission through the cerebrovascular bed are dependent both on the resistance of the vascular bed and also on processes which affect the craniospinal compliance, some of which may be non-vascular in origin.

**Methods:** An automated method for measurement of craniospinal compliance has been developed<sup>4</sup> which is now in the final stages of a clinical validation study. In light of this recent development, the authors are organising a multi-centre study, co-ordinated by three centres with an active interest in this field, to obtain data, prospectively, on compliance and the ICP and MCA flow velocity waveform. Data will be collected continuously during normal monitoring but also during reactivity testing of the patient to CO<sub>2</sub> and mild pressor challenge. Data will be stored in a shared database with Internet access to encourage a multi-centre approach to analysis and modelling of the data.

**Results:** A protocol has been designed and an analysis methodology is being developed. We propose to present the protocol to both encourage international discussion on its design and to mobilise interest in participating in the study.

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