

# MONITORING OF INTRACRANIAL PRESSURE AND OTHER VEGETATIVE PARAMETERS IN NEUROSURGICAL PRACTICE

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Continuous recording of ICP from the ventricles or epidural space is an established practice in many neurosurgical centers. However only in few instances other vegetative parameters which are checked routinely in neurosurgical patients are available for detailed analysis together with intracranial pressure. The paper describes the system which has been used for over one year for monitoring of intracranial pressure and acquisition of other data in a 12 bed intensive care unit of the Dpt. of Neurosurgery at the University of Giessen. 50 patients have been studied. The system accepts following parameters: 2 pressure recordings (providing the possibility to record intracranial pressure from two different compartments), one channel ECG, respiration curve, two channel electroencephalographic tracing, arterial blood pressure, respiration rate, pulse rate and temperature curve.

## Intracranial pressure recording -

majority of the recordings were done from the frontal horn of the ventricle according to Lundberg method /1/. The transducer used was Statham SP 37 connected directly to the ventricular catheter or via a rigid polyethylene tube and 17G needle to the Rickham reservoir. The transducer is fixed by strips at patients' head and covered with light sterile dressing. In few instances Miller Micro-Tip catheter FC 475 or FC 350 were placed directly into the ventricle. Epidural pressure was recorded through Sensotec PF 7 BW (2) transducers but was abandoned because of unpredictable zero point drift

in vivo.

The signals from the transducer are amplified through bedside Siemens Electro-manometer with separators, the amplifier being previously balanced for each of the transducers.

ECG, EEG are recorded according to standard methods, respiration curve and rate is recorded through a thermistor, pulse rate counted from the ECG curve. In the majority of patients indirect method was used for recording the systolic and diastolic blood pressure. The temperature was recorded through the rectal probe.

## Display of the acquired data

Three recording systems are used in order to provide rapid documentation, visual display of the trend over 24 hours for medical and nursing personnel and storage of data for statistical analysis:

1. 8 - channel ink - jet recorder (Mingograf Siemens) with speed adjustable from 2.5 - 500 mm/sec is used for recording of rapid pressure changes, influence of arterial and venous pulse upon ventricular pulse, respiratory influences upon ICP, Queckenstaedt, and Valsalva tests, infusion tests, etc.
2. 12 - channel multicolor point printer (Compensograf Siemens) with speed 20 - 60 - 120 mm/h. The scale of all the channels is freely adjustable. The values for pressure recordings, pulse rate, respiration rate, temperature are printed every 24 sec. the values of blood pressure every 2.5 min. Build in separators permit to record the maximal and minimal value of intraventricular pressure at 2 sec intervals, reflecting indirectly the variations occurring with