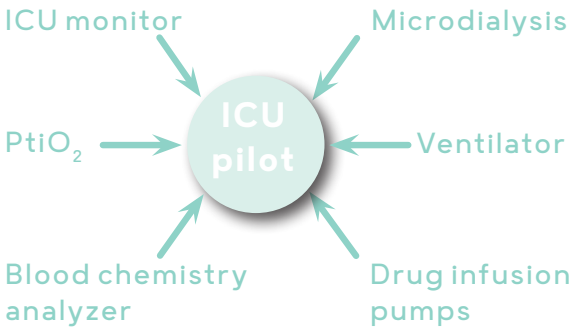
Early detection of secondary insults & software for Multimodal Monitoring

The Concensus paper (Hutchinson et al. Intensive Care Med. 2015) from the International Microdialysis Forum meeting in Cambridge includes; experts guidance for use of microdialysis in traumatic brain injury and subarachnoid hemorrhage, catheter location, reference values and interventions. Find below a few conclusions from the paper:

- Low brain glucose is associated with unfavorable outcome.
- An increase in the Lactate Pyruvate (LP) ratio in the presence of low pyruvate (and low oxygen) indicates ischemia.
- An increase in the LP ratio in the presence of normal or high pyruvate (and normal oxygen) indicates mitochondrial dysfunction.
- A high LP ratio is associated with unfavorable outcome.

ICUpilot - software for multimodal monitoring

ICUPilot is a unique tool for multimodal monitoring in the ICU. Bedside Patient Monitors (showing e.g. pulse, blood pressure, ICP, CPP) as well as the Microdialysis Analyzer can be connected to a separate computer for on-line analysis and comparison of all data collected bedside during the entire care of the patient.



Literature:

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Cerebral Metabolism and the Role of Glucose Control in Acute Traumatic Brain Injury. Buitrago Blanco MM, Prashant GN, Vespa PM. Neurosurg Clin N Am. 2016 Oct;27

M Dialysis AB

M Dialysis is the leading company devoted to the development, manufacturing and marketing of the Microdialysis technique.
The head office is located in Stockholm, Sweden, with a subsidiary in Boston MA, USA. M Dialysis has distributors across the globe, responsible for local sales, service and support.

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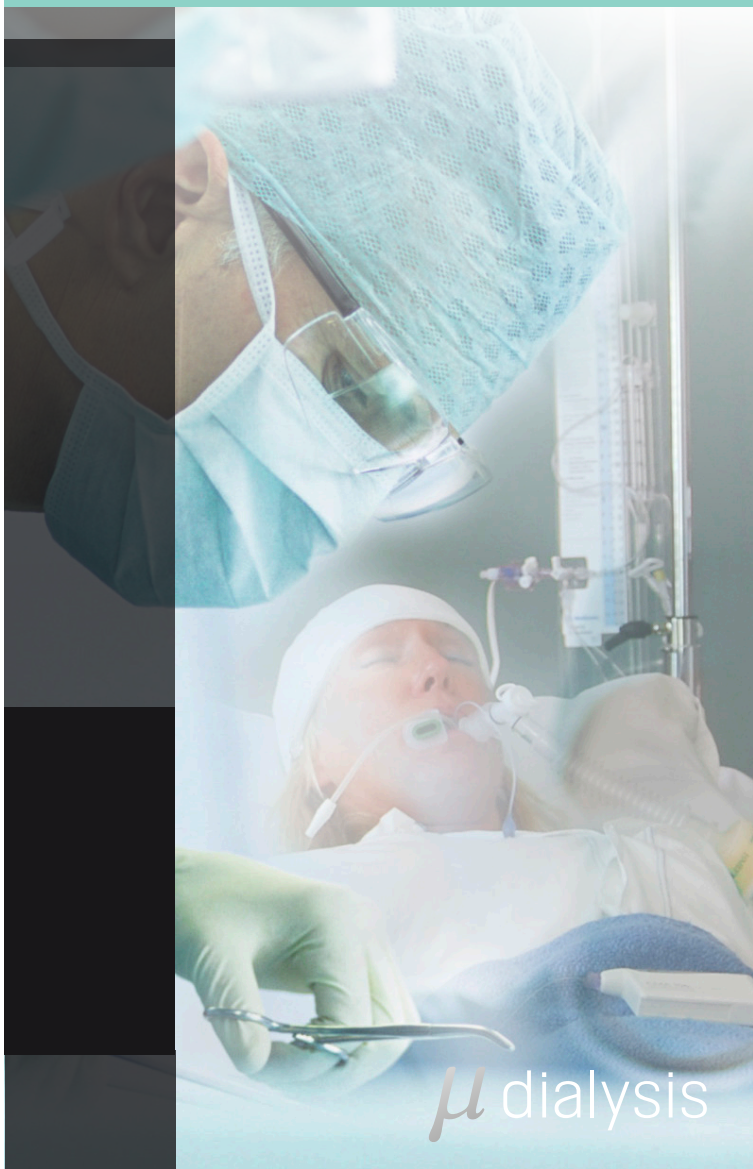
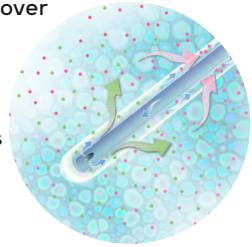
Microdialysis

Advanced monitoring in neurointensive care



Microdialysis in Neurointensive Care

Microdialysis is a tool for in vivo sampling of soft tissues that utilizes the principal of diffusion through a semi-permeable membrane. The technology is minimally-invasive, easy to handle, and may be used continuously over a period of several days.



The method is performed by inserting a Microdialysis catheter into the tissue being studied. The Microdialysis membrane of the catheter is in direct contact with the soft tissue.

The catheter is perfused with a sterile isotonic solution via a small pump attached to its inlet lumen. In the tissue, substances from the interstitial fluid diffuse through the semi-permeable Microdialysis membrane into the perfusion fluid. This fluid, now known as dialysate, moves through the outlet lumen and into a collection microvial. Microvials are exchanged at regular intervals. The dialysate collected may be analyzed immediately using the ISCUS^{flex} Microdialysis Analyzer.

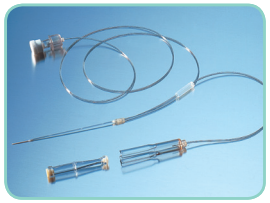
The metabolite values in the dialysate provide a picture of the local tissue metabolism. This has been particularly useful in neurointensive care as there are well described metabolic changes that occur with secondary ischemic events in the cases of traumatic brain injury (TBI) and subarachnoid hemorrhage (SAH).

Secondary ischemia is a frequent and serious complication affecting patient outcome. Since Microdialysis allows continuous surveillance of cerebral metabolism in a clinical setting, secondary ischemia and mitochondrial dysfunction can be recognized at an early stage. Thus, the technique opens a window of opportunity for therapeutic interventions.

Microdialysis sampling

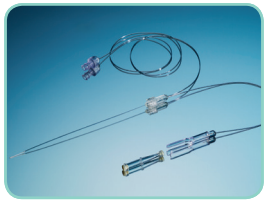
Microdialysis sampling is carried out by placing the sterile FDA cleared Microdialysis catheter in the brain parenchyma. All Brain Microdialysis Catheters have a gold thread in the tip so confirmation of placement can be verified by CT.

70 Brain Microdialysis Catheter



- Free positioning and fixation by tunnelation
- Available in different shaft and membrane lengths

70 Bolt Microdialysis Catheter



- Access and fixation using a bolt system

106 Microdialysis Pump

The 106 Microdialysis Pump, operating at a fixed flow of 0.3 uL / min, is dedicated for the perfusion of Microdialysis catheters with sterile isotonic perfusion fluid.

ISCUS^{flex} Microdialysis Analyzer

The ISCUS^{flex} Microdialysis Analyzer is specially designed to handle small sample volumes. It is a point of care analyzer for monitoring metabolic changes in brain tissue.

Biochemical markers:

Glucose

Lactate

Pyruvate

Glycerol

Glutamate

LP-ratio

The ISCUS^{flex} Analyzer is easily operated by medical professionals. It provides unique opportunities for early detection of metabolic crisis, ischemia and to guide post-operative interventions. Data is displayed as trend curves for easy and fast interpretation.