Courses and Symposiums
M Dialysis offers regular courses and symposia for clinical researchers, surgeons, intensivists and nurses in different applications. For information and registration visit our website www.mdialysis.com.

Bibliography
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M Dialysis AB
M Dialysis is the leading company devoted to the development, manufacturing and marketing of the Microdialysis technique. The company was originally founded in 1984 under the name of CMA Microdialysis and was the first company in the world to market Microdialysis products and know-how. Consumables, instruments and computer software are developed and manufactured in Sweden with ISO 13485 certification. M Dialysis offers an extensive portfolio of CE approved and 510(k) cleared microdialysis products for clinical use in tissues and organs. The core technology and the essential peripherals are protected by US and International patents.

Traumatic Brain Injury (TBI)
A microdialysis catheter was placed in the penumbra surrounding a traumatic brain lesion. A decrease in CPP (black line) caused an increase in LP-ratio (blue line) above the thin horizontal line, which is the threshold for ischemia (>25). A subsequent increase in CPP improves LP-ratio.

Vasospasm after Subarachnoid Hemorrhage (SAH)
The graph shows a patient suffering SAH from a ruptured aneurysm. A microdialysis catheter was placed in the region of the parent vessel territory. LP-ratio initially decreased to below ischemic levels (shaded area). A sudden increase was followed by "pulsating" changes in LP-ratio, discriminating vasospasm from ischemia. Subsequently, Glycerol values increased dramatically above normal levels (shaded area) which indicated damage to cell membranes. The Transcranial Doppler (TCD) indicates vasospasm considerably later than microdialysis.

Intraperitoneal Ischemia after right sided Hemicolectomy
A dramatic decrease in Glucose and increase in LP-ratio, indicated severe ischemia of the gut. Glucose before clinical signs were evident. The adjustment of ischemia improved the condition and eventually brought glucose and LP-ratio back to normal levels.

Free Osteocutaneous Fibula Flap
Two hours post operatively the Microdialysis values indicated ischemia whereas no clinical signs of ischemia were observed. During the following hours the Microdialysis values deteriorated with a high Lactate and low Glucose level. The decision was taken to re-operate, a venous thrombosis was found and a new anastomosis was performed. The flap survived.

LABpilot – software for interpreting data
Visualize, compare and view your microdialysis data in graphical user interface. Drag and drop, insert variables into the same graph to enable faster interpretation. For simulate a hypothesis and test it immediately.

ICUpilot – software for multi modal monitoring
ICUpilot is a unique tool for multimodal point-of-care monitoring. ICU instruments (e.g. pulse, blood pressure, ICP, CPP) as well as your Microdialysis analyzer can be connected to a separate computer for online analysis and comparison of all data collected in real-time during the entire treatment of the patient.

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Microdialysis catheters

Catheters with different dimensions and lengths, as well as different membrane properties, are manufactured for microdialysis. A pump with a fixed standard flow rate of 0.3 μL/min and one with an adjustable flow rate of 0.1 – 5 μL/min are available. The high recovery of the substances and high flow rates allow use of short sampling times.

Bedside analyzer

A dedicated bedside analyzer is rapidly analyzing the microdialysis samples. The analyzer has a touch screen showing the results as trend curves, making it easier to detect signs of ischemia. Early detection of flap ischemia allows early surgical intervention.

Markers for tissue energy metabolism, lipolysis and cell damage

Glucose, Lactate and Pyruvate are markers for ischemia, hypoxia and hypoglycemia in peripheral and central tissues. 

\*Growth is a marker for lipolysis in adipose tissue and cell membranes damage in most other tissues. 

\*Glycerol is a marker for cytotoxicity in brain tissue.

\*Urea is a marker for urea clearance during hemodialysis.

The benefit of monitoring tissue chemistry is to detect pathological events before they manifest themselves as clinical signs. This offers a unique possibility to monitor tissue and organ chemistry and to rapidly make its way into clinical practice and medical research.

Microdialysis can be used in essentially any tissue or organ: 

- Adipose tissue
- Brain
- Different segments of the Hepatic artery
- Liver
- Peristomal cavity
- Resting skeletal muscle
- Skin
- Bone
- Breast tissue
- Heart
- Kidney
- Nose
- Lung

Microdialysis has designed different catheters approved for microdialysis in brain, adipose tissue, resting skeletal muscle, intraperitoneal cavity, and hepatic tissue. Clinical research has been performed in many other tissues and organs with local ethical committee approvals.

The advantages of microdialysis include:

- Minimally invasive: A microdialysis catheter is introduced into the tissue and a microinfusion pump perstomizes the catheter with a physiological fluid. The pump uses a membrane that allows the chemical substances in the fluid to diffuse across the membrane into the perfusion fluid, which is continuously withdrawn and analyzed.
- The interstitial fluid diffuse across the membrane into the perfusion fluid, which is continuously withdrawn and analyzed.

When the blood supply of blood and tissue is inadequate, it is followed by an increase in tissue lactate and a decrease of tissue glucose and oxygen. This is detected by a microdialysis catheter, which is introduced into the tissue of interest. The catheter functions like a blood capillary. Chemical substances from the interior of the catheter are collected in microvials and analyzed bedside as often as needed.

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Metabolic tissue monitoring

Microdialysis enables monitoring of essentially any chemical event taking place in the interstitial fluid. Samples can be collected and analyzed continuously to follow trends of interstitial tissue chemistry in real time. The microdialysis catheter functions like a blood capillary. Chemical substances from the interior of the catheter are collected in microvials and analyzed bedside as often as needed. 

Minimal invasiveness

A microdialysis catheter is introduced into the tissue and a microinfusion pump perstomizes the catheter with a physiological fluid. The pump uses a membrane that allows the chemical substances in the fluid to diffuse across the membrane into the perfusion fluid, which is continuously withdrawn and analyzed bedside as often as needed.

Continuous perfusion fluid is pumped through the catheter into a microvial where the sample is collected and then transferred to the analyzer. The analysis results are displayed as trend curves on the screen.