Implementing Microdialysis and the Implications for the ICU Nurse
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Microdialysis Aligns with JHS Pillar of Quality
Provision of care and treatment of services

Definition: Microdialysis
Process of monitoring brain chemistry after injury such as a traumatic event to determine the extent of the injury. The process monitors the levels of glucose and other important solutes in brain tissue.

Brain Tissue Chemistry
Substances monitored includes:
- Glucose
- Lactate
- Pyruvate
- Lactate/pyruvate ratio.
Other substances monitored:
- Glutamate
- Glycerol

Markers of Cell Damage
Glucose and pyruvate concentrations Metabolism involves oxygen use Less when there is ischemia Lactate concentration Rises during conditions where there is no oxygen (ischemia) During ischemia/hypoxia Lactate/pyruvate ratios increase

The Concept of Microdialysis
The probe or catheter mimics a blood capillary. The probe is introduced into tissue and is permeated with a solution at a constant rate. Solutes (analytes) are small enough to cross the probe membrane per diffusion

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Microdialysis Equipment

Microdialysis catheter
CMA 106 Microdialysis Pump
CMA 600 Analyzer

www.microdialysis.com

Requirements for Implementing Unit Microdialysis
Staff training
Point of Care Testing
- Laboratory requirements for diagnostic testing at the bedside Nursing Protocol Documentation
- Order set
- Flow sheet

Role of the ICU Nurse in Microdialysis
Communication: ICU nurse is made aware patient has microdialysis catheter Two (2) hours before patient arrives to ICU
- Start up CMA 600 machine
- Mix reagents and calibrates machine
- Run quality control samples
- At bedside, prepare CMA 106 microdialysis pump with perfusion fluid Once patient arrives in ICU
- CMA 106 microdialysis pump is attached to catheter
- ICU nurse runs samples
- ICU nurse records data
- ICU nurse analyzes chemical trends

Resources
Nurse Manager Violet Kramer, RN, MSN - vkramer@jhsmiami.org
Nurse Educator Lee FongHong, RN, MBA, MSN, CCRN - lfonghong@jhsmiami.org
Microdialysis champions
- Jillian Miller, RN - jmiller1@jhsmiami.org
- Margie Francis, ARNP, CCRN - mfrancis2@jhsmiami.org
Product representative John Fournier 1-800-440-4980 x126
POC coordinator
- Virginia Pontigas – virginia.pontigas@jhsmiami.edu
Physician Ross Bullock, M.D., PhD. – rbulluck@med.miami.edu

Patients that had Microdialysis
All have been involved in some traumatic event
All had surgical removal of part of the skull i.e. craniectomy
All had Intracranial Pressure (ICP) monitoring
Other therapies: selected patients with brain oxygenation monitoring (Licox), induced hyperthermia and continuous EEG, chemical paralysis

55 yr old male - Fall
21 yr old female - Shot in head
69 yr old male - Motor Vehicle Crash
57 yr old male - Assaulted
60 yr old male – Pedestrian hit by car
22 yr old male – Motor Cycle Crash
20 yr old male - Motor Vehicle Crash
32 yr old male - Assaulted
17 yr old male – Motor Vehicle Crash
40 yr old female - Fall

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