

# The Past, Present and Future of Neurocritical Care



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Over the past 30 years, neuro-ICU's have evolved from neurosurgical units focused primarily on post-operative monitoring to units that provide comprehensive medical and specialized neurological support for patients with life-threatening neurological diseases. Outcomes research has established that victims of severe brain injury experience reduced mortality, better functional outcomes, and reduced length of stay when cared for by neurointensivists in a dedicated neuro-ICU. Neurointensivists defragment care by focusing on the interplay between the brain and other systems, and by integrating all aspects of neurological and medical management into a single care plan. In the US a national system for accrediting training programs and certifying intensivists with special qualifications in neurocritical care is currently being established by the United Council of Neurologic Subspecialties. Areas of expertise unique to neurocritical care include: management of ICP, hemodynamic augmentation to improve CBF, therapeutic temperature management, and brain multimodality monitoring (i.e. cEEG, brain-tissue oxygen, and microdialysis). The true added value of dedicated neurocritical care units is their ability to resuscitate and salvage "the sickest of the sick"-deeply comatose patients with subarachnoid or intracerebral hemorrhage, traumatic brain injury, cardiac arrest, and status epilepticus. The basic premise is that an initial trial of maximal intervention-emergency cardiopulmonary and neurological resuscitation- offers the best approach for achieving good outcomes. Advanced monitoring techniques such as continuous electroencephalography, brain tissue oxygen monitoring, and microdialysis can detect harmful secondary insults, and eventually may be used as end points for goal-directed therapy, with the aim of creating an optimal physiological environment for the comatose injured brain. As part of this paradigm shift, it is essential that aggressive surgical and medical support be linked to compassionate end-of-life care. As intensivists become confident that comfort care can be implemented in a straightforward fashion after a failed trial of early maximal intervention, the usual justification for withholding treatment (survival with neurological devastation) becomes less relevant, and lives may be saved as more patients recover beyond expectations.

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