



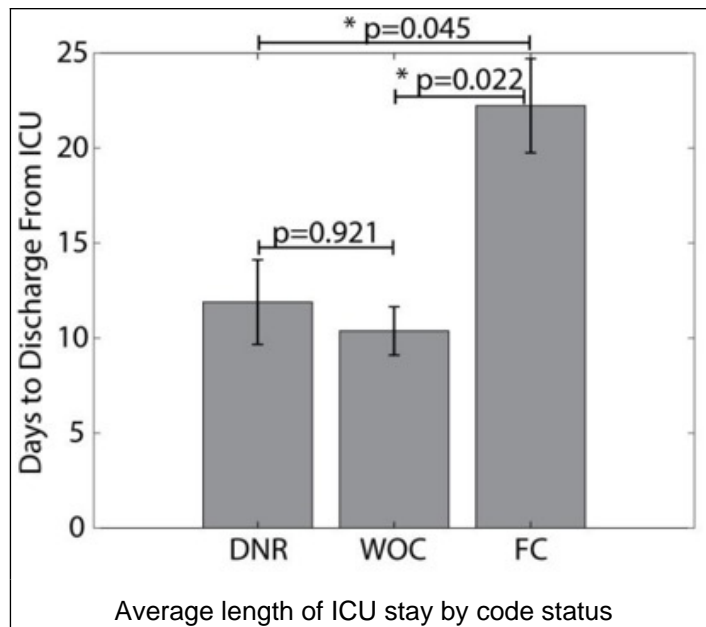
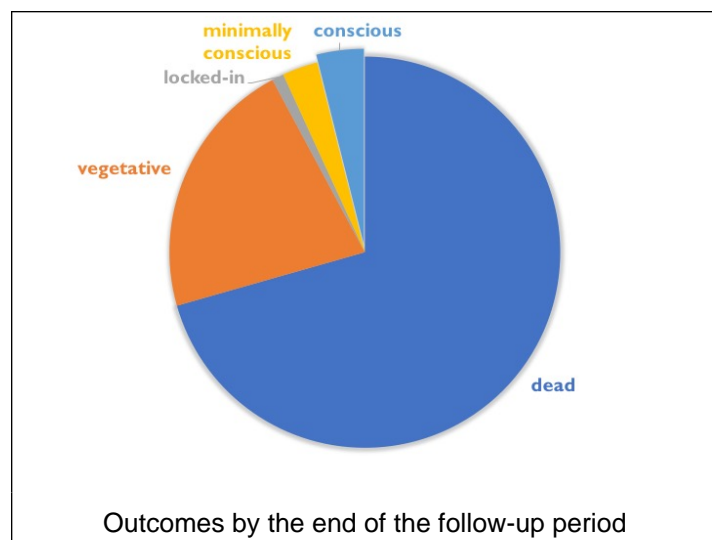
Introduction

A significant proportion of critical care resources is used to deliver nonbeneficial care, defined as care for patients who have no expectation of recovery. The neuroscience ICU (NICU) represents a particular challenge, as modern critical care medicine has become exceedingly efficient at preserving cardiovascular function, even in the face of devastating neurologic injuries that are certain to lead to death or severe permanent disability.

Methods

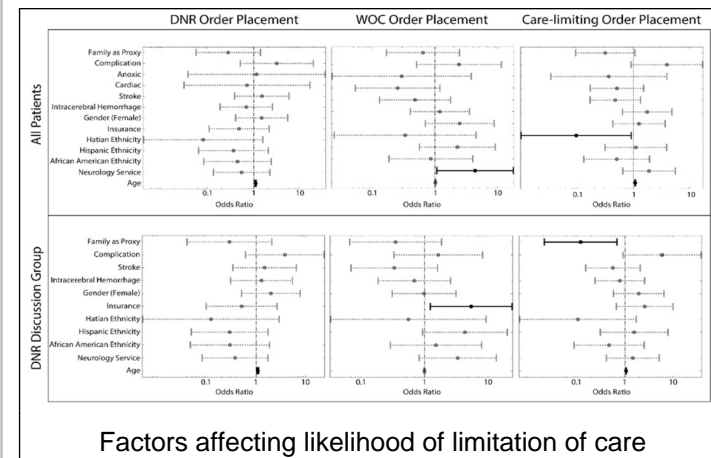
We set out to prospectively test the hypothesis that simple criteria can identify patients at high risk of receiving nonbeneficial care early during their illness. Over a 19-month period, all patients admitted to our 24-bed NICU were screened prospectively and included in the study if the following criteria were met:

- 1) coma with partial loss of brain stem reflexes for >24 hours (excluding cranial nerve deficits from lesions outside the brain)
- 2) structural lesion of the brain to explain the neurological condition
- 3) absence of medical confounding factors.



Results

A total of 102 patients were included, of which 72 patients died after a mean of 16 days (median: 8 days), and 23 remained either comatose, locked-in, or in a vegetative state. Four were conscious and following commands, while three were minimally conscious, episodically obeying simple commands. Three out of four patients who regained the ability to obey commands were young males with traumatic brain injuries and diffuse axonal injury. Patients who remained full code spent a mean of 22.2 days in the NICU, compared with 10.4 for those who had withdrawal of care (p=0.022), and 11.9 for patients who received a do-not-resuscitate order (p=0.045). Time to death did not differ significantly between the groups. Overall, institution of various limitation of care protocols correlated positively with older age (OR=1.07, p=0.0008), being treated on the neurology service (OR=4.4, p=0.043), and having health insurance (OR=5.4, p=0.03).



Conclusions

We identified simple criteria which can be used to identify patients in the NICU setting for whom continued aggressive care is likely nonbeneficial. Furthermore, limitation of care protocols significantly decreased ICU length of stay. Given the emotional distress of a prolonged hospital stay with a poor outcome for family members, as well as the immense cost to the medical system, we believe this data further supports early discussion of prognosis and goals of care in this patient population. At the same time, it remains vitally important to assess each case individually, as factors such as age and pathology can have a significant effect on outcome in our population of patients presenting in extremis. Notably, young patients with traumatic brain injuries and diffuse axonal injury fared significantly better than the remainder of our cohort.