

Children with respiratory failure can be awake yet comfortable in ICU

January 29 2015, by Evan Lerner

For small children, being hospitalized is an especially frightening experience above and beyond the challenges of whatever they are being treated for. They are often connected to a variety of unpleasant tubes and monitors, which they may instinctively try to remove.

Standard practice in hospitals is to fully sedate such children for their comfort and safety, but a new study, led by Martha Curley, the Ellen and Robert Kapito Professor in Nursing Science at the University of Pennsylvania School of Nursing, shows that lighter, more finely-tuned sedation can be just as effective.

The study, published in the *Journal of the American Medical Association*, shows that this individualized sedation protocol did not increase the time children spend on mechanical ventilators, necessary to help them breath, and did not increase adverse events, such as pain and agitation.

Those factors being equal, having [pediatric patients](#) be more awake and responsive is beneficial in monitoring their recovery and avoids some of the negative repercussions, such as bedsores that can form after long periods of immobility.

Simply using fewer powerful sedatives is also a boon in and of itself, as the long-term effects of sedation on cognitive development remain unclear.

The study began as way of balancing two competing priorities in

pediatric care.

"As clinicians, our primary goal for all of our kids is to keep them comfortable, especially when they are heavily instrumented in the ICU," Curley said. "The problem is that, if we give them too much sedation, they also stop breathing and stop moving, a state that is not helpful in their recovery."

To better understand the right balance in the sedation equation, Curley led the study known as RESTORE, or Randomized evaluation of sedation titration for respiratory failure.

"The RESTORE study looks at tailoring the level of sedation to how sick the child is," Curley said. "When they were very sick, we kept them fully sedated. But as they started getting better, we matched the level of sedation to their need to move and be more responsive."

Data from adult patients showed that this minimal-sedation approach resulted in less time on ventilators. However, it was unclear whether such findings would apply to children, as they are less able to communicate their needs and have a harder time tolerating the various medical interventions performed on them.

"We wanted to know if we could keep kids in a more awake state and have it be safe for them." Curley said. "If uncomfortable, it's a safety risk; what 2-year old would ever lay quietly with strangers caring for them?"

Their findings, resulting from data gleaned from 2,449 pediatric patients, showed that their tailored protocol provided a minimum but effective level of sedation.

"We found that the sedation protocol didn't reduce the time they were on

the ventilators, but they had a different sedation experience," Curley said. "The kids were more awake, more interactive, had fewer pressure ulcers. And being exposed to less of these toxic drugs is a potentially huge benefit for them. We can give kids the best ICU treatment and without harming them."

Next steps in the RESTORE study will help clarify other health impacts sedation has on pediatric patients. To better understand the long-term effects in the sedation equation, Curley is leading a longitudinal study known as [RESTORE-Cognition](#) with colleagues from Seattle Children's Hospital. This follow-up study will be one of the most comprehensive studies ever undertaken in pediatric critical care. RESTORE-cognition aims to track the outcomes for pediatric patients who received various [sedation](#) strategies during acute illness.

"Part of our follow-up study will involve bringing these children back and, after controlling for multiple factors, figuring out which sedatives are the best from a cognitive impact perspective," Curley said.

More information: "Protocolized Sedation vs Usual Care in Pediatric Patients Mechanically Ventilated for Acute Respiratory Failure: A Randomized Clinical Trial." *JAMA*. 2015;313(4):379-389. [DOI: 10.1001/jama.2014.18399](#).

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