

## Johns Hopkins Study Finds Early Physical Rehabilitation in the ICU Leads to Better Patient Outcomes

Novel early physical therapy interventions in the intensive care unit sustained 5 years beyond inception via structured quality improvement process

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### FAST FACTS:

- Timely initiation of physical therapy in intensive care unit improved outcomes via quality improvement processes.
- Study suggests culture change is sustainable over time and improves quality care.
- With education, guidelines and removal of barriers, quality improvement can actually work and last, study finds.

In a pre- and post-evaluation study, Johns Hopkins Medicine researchers found that quality improvement processes for delivering early physical rehabilitation in an intensive care unit (ICU) were sustained five years later — benefiting both patients and the health care facility. These processes resulted in major changes in clinical practices for treating critically ill patients by encouraging early physical therapy in the ICU.

The study was published in the October issue of the *Annals of the American Thoracic Society*. “We know that the early start of physical rehabilitation in the ICU improves patients’ outcomes,” says [Dale M. Needham, M.D., Ph.D.](#), medical director of the Critical Care Physical Medicine and Rehabilitation Program at Johns Hopkins and senior author of the study. “In this study, we wanted to evaluate whether our quality improvement project had a lasting effect on the early delivery of rehabilitation in the ICU.”

Working in a single medical ICU at Johns Hopkins, Needham and his team collaborated with hospital staff and administrators to promote the sustainability of their quality improvement project, including removal of barriers, further interdisciplinary education and communication, and the continued participation of over 20 physical therapists who worked in the medical ICU after the quality improvement period.

“None of these results happened by accident,” says Needham, “and if hospitals use a structured approach to creating this change, they can be successful too.”

For Needham, that structured approach included making the business case to hospital administrators that investing in early rehabilitation programs could improve patient outcomes while also reducing hospital costs, since these patients had shorter lengths of stay.

There are many barriers to overcome when incorporating early active physical rehabilitation in the ICU, but sustaining such a quality improvement project is really about changing culture. “Most people who work in an ICU were trained to think that we should deeply sedate patients and give them bed rest,” says Needham. Introducing active physical therapy even while patients are on mechanical ventilation “really takes everything we’ve known — including how we’ve designed our intensive care units — and turns it on its head.”

To quantify the lasting effects of their quality improvement project, Needham's team compared data that had been collected from a prospective cohort study (pre-quality improvement) with data that was collected beginning a year after starting the quality improvement project (post-quality improvement). Patients in both pre- and post-quality improvement groups suffered from acute respiratory distress syndrome, which is an archetype of critical illness.

"We had dramatic changes after the quality improvement project compared to before the project," says Needham. Among ICU survivors, a higher proportion of patients received physical therapy in the ICU — 89 percent post-quality improvement versus only 24 percent pre-quality improvement — and there were fewer days before starting physical therapy in the ICU — a median of four days post-quality improvement versus 12 days pre-quality improvement.

The team also examined the functional abilities of patients — whether patients were able to stand or walk while in the ICU — and found that 64 percent of post-quality improvement patients could, compared with only 7 percent of patients before the quality improvement project.

While a multisite quality improvement project seems like the next logical step, running such a project is challenging, says Needham. "Each ICU considers these changes over its own time frame." However, Needham and his team "do spend a great deal of time helping other ICUs change practice to adopt early physical rehabilitation," including an annual [critical care rehabilitation conference](#) at Johns Hopkins for practitioners from around the world, now in its fourth year.

Given both the advances in critical care and the aging population, there's a growing pool of ICU survivors who often suffer with physical impairments for years after the ICU. As a result, these patients may delay returning to work and may utilize the health care system more. "The key to addressing these issues is to start rehabilitation early," says Needham, which requires sustainably changing the culture in ICUs.

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