Multispecialty centers for pediatric dysphagia deliver better outcomes, reduced costs

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Children who choke when they drink or eat may have what's known as dysphagia, or a swallowing disorder—one of the most common medical complaints seen in young children. This condition can be due to various

causes that require care from clinicians with expertise in areas including otolaryngology-head and neck surgery, gastroenterology, pulmonology, pediatric surgery, and speech-language pathology.

A new study has found that by combining these different medical disciplines in one center rather than a typical care journey making appointments one specialist at a time, children had better outcomes, reduced the number of procedures needed, and health care costs were reduced.

The new research, published online June 18 in *NEJM Catalyst Innovations in Care Delivery*, is the first study to look at value-based health care metrics by comparing integrative practice units (IPUs) to a control group of traditional, single-specialty care models.

"Children with swallowing disorders are not just an ear, a nose, a throat, or a lung or stomach; each needs to be looked at holistically as child not a body part," said study principal investigator Christopher J. Hartnick, MD, MS, Director of the Division of Pediatric Otolaryngology and the Pediatric Airway, Voice and Swallowing Center at Massachusetts Eye and Ear, and professor of Otolaryngology-Head and Neck Surgery at Harvard Medical School. "Our study shows that by caring for children with swallowing issues with many disciplines in one setting, centers would provide excellent care, while diminishing unnecessary visits and procedures, and better streamlining a diagnosis. We feel based on these results that this integrative care model can be applied to other common medical conditions."

Hartnick partnered with a leader in costing and value-based healthcare modeling, Robert S. Kaplan, Senior Fellow, Marvin Bower Professor of Leadership Development, Emeritus, at Harvard Business School. Kaplan observed, "This is the first study to demonstrate that using a multi-disciplinary integrated practice unit (IPU) to treat a complex medical

condition is not only better for patients, and their families; it also lowers the costs of the hospital to treat the condition."

Unique method to compare care for children's swallowing disorders

Swallowing problems when eating or drinking can lead to fluid entering the lungs, known as aspirations, which in turn can lead to serious lung infections like pneumonia.

Pediatric patients with feeding and swallowing difficulties who get typical care outside of an IPU may have to make appointments with one specialist at a time until they get the right diagnosis, whether it's a pulmonologist, gastroenterologist, or an ENT, among others. Specialists will look at the issue under the umbrella of their expertise and order procedures accordingly, and once they rule out a possible condition, will refer to the next specialist. This process can take weeks or months until a diagnosis is made, and bouncing around from providers and extra appointments can add stress and costs to families. In the case of pediatric aerodigestive care, each separate visit may require a test or procedure that requires undergoing general anesthesia. The researchers sought to see whether the IPU model could reduce the number of these visits, thereby reducing health care costs and improving the experience for the family.

Leaders at six hospitals partnered to assess and compare the health outcomes and costs of pediatric aerodigestive care. Four of the hospitals delivered pediatric aerodigestive care with an IPU: Massachusetts Eye and Ear in Boston, Children's Hospital Colorado in Aurora, Seattle Children's Hospital, and the Children's Hospital at Vanderbilt in Nashville, Tennessee; while two delivered care traditionally—Children's Hospital of the King's Daughters (CHKD) in Norfolk, Virginia, and the

Hospital for Sick Children in Toronto—with isolated specialists.

The researchers selected swallowing disorders because they represented a large percentage of the children seen within each aerodigestive IPU, and had a clear one-year full cycle of care that included all procedures and tests, with objective and patient (caregiver) reported outcome measures. Their study included children aged 0-10 years old with swallowing difficulties. Each center developed process maps to get a sense of which providers would see a particular patient based on presentation.

Once the data and process maps were collected, Kaplan's HBS team helped the clinicians conduct a time-driven activity-based costing (TDABC) analysis. TDABC estimates cost per minute for time and the quantity of resources used over each patient's treatment cycle and cost of all resource inputs required, including the average time, the personnel type, and space and equipment required.

Benefits from multidisciplinary care may be applicable to other diseases

The researchers found that providing care for swallowing disorders in a pediatric IPU improves better post-operative swallowing outcomes, and also lowered costs by having a single nursing team support the multiple physicians in the IPU.

In the traditional, fragmented care model, the delayed diagnoses caused higher costs for families and to the health care system for multiple physician office visits, unexpected emergency room use that led to hospital admissions, and parent's increased time off from work, travel and other care considerations.

The IPU enabled pediatric patients to get a single evaluation on the same day from multiple providers each using different diagnostic tests. If necessary based on the multidisciplinary evaluation, the procedures necessary for testing can all be done at the same time with only need for one dose of anesthesia.

Some have criticized the IPU model, believing it would reduce the number of patients that specialists can see in one day. This study found that by incorporating mid-level providers such as nurse practitioners, physician assistants and speech language pathologists into the treatment team, there was less than a 5 percent difference in the number of patients seen.

The non IPU sites required separate nursing teams for each physician. This led the average total personnel costs of the non-IPU sites to be 28 percent higher than the average of the four IPU sites ($4,284 versus $3,347). And this understates the total increase in costs. The non-IPU sites impose much higher costs and risk on the child and parents when they require separate visits to each physician, with separate procedures performed, across many more days. The lead clinicians unanimously agreed that the nurse coordinator was most important to the success of the IPU.

The study enabled each hospitals to see the process maps of the others, and to implement changes that would improve future efficiencies. For example, based on a different skill mix used at one IPU site, the others saw how to reduce nursing costs by task downshifting from a nurse to a medical assistant to room patients, and adding a patient care coordinator to increase efficiency, reduce extra testing, and improve the family's experience with the IPU.

The research had prompted the two hospitals used as controls to switch to implement their own IPU programs, and future studies will track these

institutions' changes in outcomes and costs. A similar IPU model has been employed at Mass. Eye and Ear in some programs, and may be applicable to other areas of medicine as well.

"We have seen great success with integrated practice model within our multidisciplinary Head and Neck Surgery program at Mass. Eye and Ear and Mass General Hospital," said Mark A. Varvares, MD, FACS, Associate Chair of Otolaryngology-Head and Neck Surgery at Mass. Eye and Ear, who was not involved in the study. "This new study provides evidence that the IPU model can be applied successfully to other areas of otolaryngology."

More information: Chris Hartnick et al, Assessing the Value of Pediatric Aerodigestive Care, *NEJM Catalyst* (2020). DOI: 10.1056/CAT.19.1132

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