

For Nationwide Children's Hospital, a Local Learning Health System Shows Global Promise

By Whitney McKnight

A pilot implementation of a local learning health system at Nationwide Children's Hospital fueled meaningful improvement across quality, experience, engagement and financial outcomes and served as a successful proof of concept for a value-based, EHR-supported care delivery model.

Called Learn From Every Patient™ (LFEP), the program integrated clinical care, quality improvement and research to reduce inpatient admissions by more than one-quarter, cut lengths of stay nearly in half and induce physician enthusiasm for workflow changes and reduced costs—all while maintaining a focus on an optimal patient experience.

"Patients often don't know if the care they've received is mediocre or outstanding, but they always know if their physician cares about them," said Dr. William E. Smoyer, a pediatric nephrologist and the director of the Center for Clinical and Translational Research at the Columbus, Ohio-based pediatric health system. And while cost efficiency is essential to organizational success, "no one wants to reduce costs if it means inferior care."

Tasked with the challenge of achieving the simultaneous objectives of integrating evidence-based research into clinical practice, improving the quality and experience of care and reducing costs, Dr. Smoyer and his quality improvement colleagues determined that a learning health system would best meet the organization's needs.

Defined by the Institute of Medicine (IOM) in its 2012 report, "Best Care at Lower Cost: The Path to Continuously Learning Health Care in America," as a system that is designed "to generate and apply the best evidence for the collaborative health care choices of each patient and provider; to drive the process of discovery as a natural outgrowth of patient care; and to ensure innovation, quality, safety, and value in health care," a learning health system collects, adopts and applies evidence in a systematic way.

Designed to simultaneously improve care and reduce costs, such systems use patients' electronic health records (EHRs) to develop personalized treatments based on data from patients with similar conditions. In a continuous loop, the data collected are then used to systematically transform organizational practice and, ideally, continuously improve health outcomes at lower cost.

While such a process sounds promising in theory, "I wanted to see if we could move away from editorials and opinions about the need for learning health systems, and instead generate data demonstrating they can be successfully created," Dr. Smoyer said. "I wanted to take it from the theoretical to an actual example. So we told the doctors, 'We know you're busy, but we're offering you the chance to obtain data to answer the questions you think are most important to improving the care for your patients. We will let you pick the questions, and in return you will get to analyze and publish the data to improve the care of your patients.' It was a carrot with no stick."

For the LFEP pilot, Dr. Smoyer and his colleagues reviewed the EHRs of 131 children being treated for cerebral palsy by physicians at the facility. The review revealed that not every child with a hip dislocation, which is common among younger patients with cerebral palsy, requires an X-ray to diagnose the dislocation, even though annual X-rays for every child with the condition was standard practice.

AT A GLANCE

- A one-year pilot test of a local learning health system in a cohort of cerebral palsy patients at Nationwide Children's Hospital reduced inpatient admissions by 27%, inpatient lengths of stay by 43%, urgent care visits by 29%, ED visits by 30% and total health care charges per child per year by 25%.
- The net savings associated with the system during the pilot were estimated to be more than \$1.3 million, reflecting a sixfold return on the \$225,000 investment in associated EHR protocols.
- With the efficiencies introduced by the pilot, the clinical team was able to increase the number of patients seen per clinic by 20%.

“An examination of our data revealed that this was excessive for children with mild CP,” said Dr. Garey Noritz, medical director of the Cerebral Palsy Program at Nationwide Children’s. “We have since changed our protocol for these patients, reducing their exposure to radiation, as well as reducing costs.”

To assess the efficacy of the pilot, the researchers measured and compared rates of health care utilization and associated health care charges in the cohort for the year before and then after a 12-month trial in which patients were treated with standardized care that included the collection of both routine clinical data and the doctors’ desired research data.

Overall, the results of the pilot, published in *JAMA*, showed inpatient admissions in the cohort were reduced by about 27%, from 0.75 to 0.55 per child per year. Inpatient days went from 4.67 to 2.68 per child per year—about a 43% drop—while emergency department visits were reduced by about one-third, from 1.18 to 0.83 per child per year. Urgent care visits also dropped by about 29%, from 0.50 to 0.35 per child per year, and total health care charges were reduced 25%, from \$42,045 to \$31,700 per child per year.

The cost to implement the new EHR protocols was about \$225,000, and the net savings to the system during the 12-month period were approximately six times that amount, according to Dr. Smoyer. Additionally, the clinical team was able to increase the number of patients seen per clinic by 20%. All but one of the 11 doctors involved in the advanced data capture reported that the LFEP note template made documentation both easier and faster. In addition, the data collected at this single site in 12 months have led to five academic papers that either have been published or are under development.

Dr. Smoyer specified that the Nationwide Children’s pilot program is a “local” learning health system. This is different from many other learning health systems in that rather than starting by connecting EHRs from around the country and then mining the amalgamated data, he and his colleagues started with the most pressing clinical questions of their institution’s physicians and then captured data from every patient to help answer those questions. “It’s the antithesis of starting at the system level and trying to figure out what you can learn. Instead, you originate the learning at the local level and subsequently share this information with other organizations with similar programs and questions, and teach them how to collect it so they don’t have to start from scratch,” he said.

The ultimate goal, according to Dr. Smoyer, is to have other institutions successfully capture their own data so that the learning can then be shared across many partnering health systems. Because data would be collected according to the same protocols, the reliability of the data would be enhanced and data sets would increase exponentially, resulting in more rapid evidence-based improvements in care.

The name of the pilot program, “Learn From Every Patient,” describes Dr. Smoyer’s ultimate goal: to provide evidence-based care for everyone, predicated on research that was generated from the very patients receiving that care. “This new way of combined care and documentation creates a much larger data set so that instead of only 1% or 2% of patients being involved in clinical research, we jump to 100% of patients being involved in critical research to improve care in the future,” he said.

It is very powerful for every group in the institution—including the patients—to know that the care being delivered is truly the best that evidence supports, and that with every patient visit, data are captured to continually improve that care, said Dr. Smoyer. “Patients should be part of a continual process, both generating and benefiting from evidence to ensure that all patients receive state-of-the-art medical care.”

The program also elevates data entry from being a perfunctory task, necessary for reimbursement and medical-legal purposes, to being a personal task in which each patient encounter has meaning because of its potential to improve the lives of both that patient and others with similar health concerns.

Currently, Nationwide Children’s is evaluating how to roll out similar learning health systems across its various specialties, and Dr. Smoyer is frequently asked to share with other institutions how this local approach to creating a learning health system works. He noted that the model is well suited for accountable care organizations that include fixed payments, regardless of the demand for care, and that even if a system’s physicians aren’t motivated to publish, they usually are motivated to offer evidence-based medicine when it is available.

“I have learned that, given a realistic opportunity, most doctors are very interested in improving the care of their patients. That’s why they went into medicine,” he said.