COMPUTER SYSTEMS DON'T MAKE BABIES HEALTHIER.
But give Pediatrix Inc. Vice President of Technology Bob Bryant credit for delivering the database that led to the quality improvement effort helping doctors and researchers enhance the growth of premature babies.

Pediatrix's big idea: Collect deep, objective data, then comb it to identify areas of patient care that offer opportunities for improvement. Researchers analyze trends, isolate best practices, and apply those practices to help babies get off to a better start.

Pediatrix provides neonatal and maternal-fetal physician services. Neonatal case records are kept in a clinical database called the Research Data System, or RDS. Originally designed to replace handwritten physician notes with more legible computerized reports, RDS is now used to support research, improve quality of baby care and, significantly for the business, justify insurance claims. It has grown to 50 gigabytes, with records on more than 192,000 babies.

Bryant says the RDS development is typical of how the organization has enhanced its systems one step at a time. "We've racked up a series of small successes that have added up to significant overall success for the organization," he says.

In 2000, Pediatrix set out to improve weight gains for very small infants—those born between 400 and 1,500 grams, or less than 1 lb. to about 3 lbs., 5 oz. Infants born prematurely grow more slowly than they would in the womb, impeding their physical and mental development. Generally speaking, techniques that improve their growth should also improve their health.

Pediatrix used the RDS data as a starting point. It didn't show doctors what to change about the babies' care, but it gave them clues about where to look for better ways to do things.

Researchers used the database to identify the Pediatrix neonatal intensive care units, or NICUs, with the highest and lowest weight gain results. They visited the units at both extremes and found 16 significant differences in practices. For example, virtually all high-performance units focused on supplementing intravenous feedings with feedings through the stomach as soon as practical, while the low-performance units were more likely to delay that changeover.

Once shown this evidence, NICU staffs were motivated to apply the beneficial processes more consistently.

"This really is moving away from the idea that medicine is all art and no science," says Dr. Barry Bloom, director of Pediatrix's quality improvement program. While the judgment behind a doctor's orders is important, so is the efficiency and consistency of the organization that carries them out.

In 2001, Pediatrix found 76% of the participating NICUs improved their weight gain record compared to 1999 (the "baseline" year, prior to the start of the quality improvement project). Further improvements followed in 2002, when a bell curve showed the crest of the wave—representing the majority of

4 small companies,

PEDIATRIX

76%

The percentage of neonatal intensive care units the company operates that reported improved weight gains for premature infants after a year of participation in a data-driven quality improvement program.

VP, Technology
BOB BRYANT

BIG RETURNS

locations—shifting toward the high end of the range.

As detailed in the medical journal *Pediatrics*, babies were sent home at an average weight just over 5 lbs. in 2001, compared with an average weight of 4 lbs., 12 oz in 1999. That covers more than 2,600 babies studied, with lessons for an organization that cared for more than 55,000 infants last year.

Meanwhile, research and education programs help Pediatrix show it is concerned with more than profits. "It both surprises and pleases me" that Pediatrix would make those investments, says Dr. Avroy Fanaroff of Case Western Reserve University in Cleveland. "At the same time, I think it's essential."

Though he's not a Pediatrix employee, Fanaroff has taught courses through NatalU.com, Pediatrix's neonatal "open uni-

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COMPANY: Pediatrix

BUSINESS: Operates neonatal intensive care units in hospitals across the country. Also provides obstetrics and health screening services.

HEADQUARTERS: Sunrise, Fla.

KEY BUSINESS EXECUTIVE: Barry Bloom, M.D., director of the Institute for Clinical Improvement

KEY TECHNOLOGY MANAGER: Bob Bryant, vice president of technology

PROJECT: Enhance a system intended for clinical note-taking in individual hospitals, using it to feed a central database that can then be scrutinized for clues on how to improve research and quality of care.

OBJECTIVES: Gather data once for multiple purposes; produce a legible clinical record for hospital reports, regulatory reports and research projects; and improve the health of infants.

TECHNOLOGY USED: NeoData from MetaSoft Systems; Microsoft's Access, Visual Basic, and SQL Server.

LESSON FOR BIG COMPANIES: Even processes that aren't automated can be improved by analyzing data about the outcomes of those processes.

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versity" on the Web, and followed the progress of its research and quality programs. He points out that these programs help doctors feel good about working for the company.

Pediatrix staffs 200 NICUs nationwide. To grow, it buys physician practices that staff hospital neonatal units, letting doctors focus on patient care while the company manages administrative details. Other companies formed around the concept of aggregating physician practices in the 1990s, but Pediatrix is one of the few survivors, with a profit of $68.8 million last year on revenue of $465.5 million.

TAKE NOTE
RDS grew out of a notetaking application called NeoData created by a neonatologist, Dr. William Lowe, and marketed by MetaSoft Systems of Charlottesville, Va. Pediatrix developers modified the software installed at each NICU to transmit encrypted data to an SQL Server database at headquarters. By consolidating data from each location, Pediatrix enabled companywide analysis.

At the same time, Pediatrix developers standardized data entry. Free-form entry fields gave way to drop-down lists of common conditions. For example, Bryant says, respiratory distress syndrome is now recorded the same way in every in-

stance throughout the system; previously, it was sometimes abbreviated, sometimes described with a synonym, and generally recorded with inconsistencies that made it difficult or impossible to track trends.

When Bloom's practice was acquired and he joined Pediatrix in 1998, RDS was already fueling basic research and being used to produce internal report cards so NICU staffs could make comparisons. But he saw greater potential for the data to be translated into action.

"When I joined, they were on the cusp of taking it to the next level, but weren't certain which direction to go," Bloom says. "It took me two years to get their attention, that there might be a simple way to make this useful."

Bloom pointed to a technique he previously used to reduce the frequency of infections acquired during hospital stays. The Demonstrated Best Processes methodology he advocated, created by the Lombardy Group consulting firm, boils down to contrasting the processes used at high-performance and low-performance operations to identify meaningful differences.

For all the contributions RDS has made, Bryant and project manager Pam Thomas, Pediatrix's director of clinical services and a former NICU nurse, have concluded they've pushed the current system as far as it can go. So BabySteps, a new data entry system created with Visual Basic and SQL Server, is being phased in to replace NeoData, a Microsoft Access program. The central RDS database is also being reworked into a more sophisticated data warehouse, also based on SQL Server.

BabySteps is being set up to expand in size and scope reliably, while the new data warehouse is designed to take researcher queries efficiently.

CURING THE UNCOMMON CODES
The system is having a bottom-line impact as well, thanks to the addition of a Visual Basic application called the Decision Tree, which uses data from the clinical record to suggest the standard insurance code to apply for each day of care. That's significant because disputes with insurers often revolve around the difference between codes for "evaluation and monitoring" and for "critical" care; the latter is reimbursed at a higher rate.

When Pediatrix's coding practices were scrutinized during a series of state investigations starting in 1999, jittery physicians became so much more conservative about using the "critical" codes that by the end of the year, revenues from comparable operations were down 5.3% despite an increase in services provided. Those investigations ultimately were resolved with minimal settlements, but after Pediatrix disclosed in June that it might face a similar review by the U.S. Attorney's office, stock analysts worried the phenomenon of shrinking revenues would recur. It didn't, largely because of the new software.

Programmers worked with physicians to identify circumstances that clearly justify a "critical" code and those that do not. By removing subjectivity from the process, Pediatrix wants to prove that its bills are appropriate, "neither going beyond what we should or under what we should—just what is right," Bryant says.

As Pediatrix founder and CEO Roger Medel noted in a recent earnings conference call, "Physicians are a lot more comfortable booking what the medical record recommends." ◄

—DAVID F. CARR