



CHALLENGE

To help Duke Children's Services to develop the financial resources needed to care for the most vulnerable of patients.

SOLUTION

Using JMP to find discrepancies in billing and payment, and then implementing new processes and practices to eliminate unnecessary losses.

RESULTS

Duke Children's Services achieved a gross revenue increase of 10 to 15 percent, placing it among the top performing clinical business departments at Duke Medical Center.

MORE INFORMATION

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SIX SIGMA AT WORK TOO

Dr. Tanaka's patients may be small, but his impact on the operation is huge. So, too, is the impact of Six Sigma programs at Duke—a formal method for identifying root causes of problems, making changes and measuring the success of those changes. The hospital has trained more than 30 staff members with Six Sigma Black Belt tools and some 60 with Six Sigma Green Belts. Bill Burton, director of performance services, cites improvements related to patient flow, medication safety and patient satisfaction.

Duke Children's Ward keeps costs down and services up

On any given day, Dr. David Tanaka might intubate a 26-week-old preemie, advise a regional hospital about setting up a new special-care nursery, or conduct research on neonatal medical conditions. He might also search financial records for discrepancies in billing and payment, resulting in a gross revenue increase of 10 to 15 percent.

Searching financial records may be uncommon for a clinical professor of pediatrics, but data exploration and analysis have become second nature to Tanaka. Armed with JMP statistical discovery software from SAS, Tanaka works to eliminate invoicing inefficiencies and eradicate mistakes. His process improvement and outcomes research are helping the children's ward at Duke Medical Center keep costs down and services up.

Tanaka says he began working with finances in 1997 — looking for “actionable items,” or things he could do something about — because the service was not financially healthy. Even though he has no formal financial training, Tanaka says he “just wanted to try to do something to stop the bleeding.” This situation was not unusual, he explains, because children's services that are part of adult hospitals are traditionally not profitable. “In fact, most don't even break even,” he notes. But Tanaka wanted to help stabilize the service's finances. And that he did.

Now Duke Children's Services is one of the most successful clinical business units within the Duke University Medical Center. “That's almost unheard of,” says Tanaka. Yet the success is not because doctors are charging more for their services or seeing more patients. Rather, the service's financial success has benefited from Tanaka's thorough screening of financial data and actions taken as a result of his discoveries.

Discoveries that make a difference

Even in the initial steps of financial analysis using JMP, Tanaka found processes that needed improving and items that deserved further exploration. Inconsistent billing practices, inefficiency in charge processes and noncompliant coding, for instance, were costing the ward hundreds of thousands of dollars. “When we take losses as a provider, everybody's costs go up,” says Tanaka. “But the customer should not pay for hospital inefficiency.”

To help ensure that patient costs stay down, private insurance companies, Medicare and Medicaid need to reimburse the hospital fairly. Accomplishing this task requires the coordinated efforts of both the hospital and the third party payers to ensure a ‘clean and accurate claim’ is submitted. Since Tanaka began implementing process improvement, Duke Children's Services has seen significant improvements in the claims process.

**STATISTICAL
DISCOVERY.™
FROM SAS.**

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Dr. David Tanaka
Clinical Professor of Pediatrics
Duke Medical Center

‘The devil is at the transactional level’

Tanaka explains how he found one kind of small billing error that resulted in huge underpayments: Comparison of data for actual birth weights versus diagnostic assignments revealed coding inaccuracies. Imagine the different levels of care that a healthy full-term baby requires versus a premature newborn whose lungs are not fully developed. Of course, the costs of caring for these babies differ dramatically. And how the hospital codes for that care depends significantly on how the attending physician fills out the paperwork.

For instance, the birth weight — a huge factor in how labor-intensive that patient will be — is extremely important. “The difference of 1 gram can mean the cost difference of \$30,000,” says Tanaka. That weight factor, then, needs to appear prominently on all paperwork.

The word “premature” also needs to appear on the paperwork as well. Otherwise, even a baby born at 26 weeks (as opposed to a full term of 40 weeks) can’t be coded as premature. Other factors also should be included in an appropriate sequence to enable

hospital coders and insurance professionals to understand the care given and the resulting charges.

By looking at the data in a graphical and interactive way, Tanaka can even compare how different doctors bill for the same kind of problems. “If one doctor consistently bills much higher, well, maybe that doctor’s seeing sicker kids. Or, maybe not. It needs to be looked into.”

“And Medicare, well Medicare’s a bear,” says Tanaka. Because Medicare can be so difficult to navigate, the hospital was experiencing “payment denials” for no obvious reason. Further exploration of the data, however, revealed outliers that helped tell the story. “The Duke revenue model did not account for Medicare patients who have already been hospitalized that year and have met the deductible that Medicare sets,” says Tanaka. “In the beginning of the year, it all looks fine. By the end of the year, though, you’re getting less money for these patients.”

Tanaka’s work also identified a Medicaid denial involving concurrent billing of initial critical-care hours. Working within

the Department of Pediatrics, Tanaka has since identified a data collection and reporting approach that results in the best revenue outcome consistent with existing Medicaid policies.

In contrast to the usual deterministic approach that simply focuses on identifying errors, Tanaka focuses on a method to examine very large databases for systematic causes of variance. In his analytical approach, the magnitude of the error is less important than the repetitive nature of the variance. As a result, correction of process errors result in a system-wide ‘fix’ rather than an isolated ‘patch’ of a much larger problem.

Discoveries yet to be made

Tanaka continues to implement new strategies to improve operational and financial processes in the Duke health-care system. In his sights are several promising ways in which he believes JMP can improve pediatric care. By tracking and conducting cluster analyses of children treated in emergency rooms and in doctors’ offices for trauma, kids who are at risk for child abuse could be identified, Tanaka says.

“Tracking the success of intervention programs would be another valuable use of JMP,” says Tanaka. Right now, anti-smoking programs and nutritional counseling for pregnant mothers, for example, are not correlated to the birth weight and health of their newborns. “We could look at the mother all the way back and then at the baby all the way along,” he says. “There’s so much to do in outcomes research,” says Tanaka. “And there’s so much we have to gain from looking at these correlations. JMP is an outstanding tool to do that.”



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JMP HEADQUARTERS and SAS AMERICAS 1 (919) 677 8000 WWW.JMP.COM

JMP Headquarters
SAS Institute Inc.
SAS Campus Drive
Cary, NC 27513
USA
Tel: +1 919.677.8000
Fax: +1 919.677.4444
jmpsales@jmp.com
www.jmp.com

JMP Europe
SAS Institute
Henley Road
Medmenham
Marlow
SL7 2EB
United Kingdom
Tel: +44 (0)1628 486 933
Fax: +44 (0)1628 483 203
jmpsales@jmp.com
www.jmp.com

JMP Japan
SAS Japan Head Office
Inui Bldg. Kachidoki
1-13-1 Kachidoki
Chuo-ku Tokyo 104-0054
Japan
Tel: +81 3 3533 3887
Fax: +81 3 3533 1600
jmpjapan@jmp.com
www.jmp.com/japan

JMP China
SAS China
25/F POS Plaza
1600 Century Avenue
Pudong New District
Shanghai 200122
PRC
Tel: +86 21 6876 5353
Fax: +86 21 6876 9010
jmpsalesprc@jmp.com
www.jmp.com