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\$1.3 Million from Big Data QI

A Maryland hospital has gone from losing \$1.2 million in quality-based reimbursement in one year to gaining \$1.3 million the next year, after implementing several quality improvement initiatives using big data.

In the first year after the Maryland Health Services Cost Review Commission (HSCRC) initiated payment adjustments to state hospitals' rates according to their performance on a set of quality indicators, Western Maryland Health System in Cumberland ended up ranked 46th out of 46 hospitals.

With one 205-bed hospital that provides care in a rural area across West Virginia, Pennsylvania, and Maryland, Western Maryland already was struggling and decreased reimbursement would only worsen its situation. Looking for a solution, in 2010 Western Maryland was one of 10 Maryland hospitals that volunteered to participate in a demonstration project called Total Patient Revenue (TPR), a model that provided fixed revenue for all inpatient and outpatient services provided in the hospital.

The goal was to encourage the hospital to provide the most appropriate care in the most appropriate setting, says **Susan Mays**, vice president of Dimensional Insight, a data analytics company in Burlington, MA, that assisted Western Maryland with developing quality improvements by mining its data. *(For more on the use of big data, see "Time to Use Big Data for Quality Improvement," HPR, February 2017, pp.13-17.)*

Western Maryland lost \$1.2 million in revenue in 2012 due to its low performance on core measures, patient satisfaction, and potentially preventable conditions, so the hospital launched several initiatives for improvement. The hospital wanted to emphasize value over volume, reduce admissions and readmissions, provide care in the most appropriate location, improve chronic care delivery, reduce variation in quality, and reduce utilization rates in the ED, inpatient department, and ancillary services.

Better use of data was necessary for any of that to happen, Mays says, so the hospital adopted software that would allow it to extract data on a continual basis, showing quality performance in real time rather than looking backward. Western Maryland also began tracking potentially preventable conditions, which allowed it to reduce the number of patients who acquired preventable conditions while in the hospital. When a patient was diagnosed with a hospital-acquired condition, clinicians used big data analytics to search for previous patients with the same diagnosis and other factors that were similar, determining which order sets had worked best on those patients.

“They developed a dashboard of quality indicators for their clinicians and quality leaders, using a series of metrics, and were able to report those metrics on a daily basis instead of the historical method of doing chart reviews, sending them out to a quality organization, and getting them back two months later,” Mays says. “This was near real time, bringing all this information to them when the patient presents, giving providers a heads-up and the opportunity impact utilization and outcomes while the patient is in house.”

Hospital leaders had known for some time that the data for its daily readmission reports were calculated differently than the data used by the state to determine reimbursement rates, setting the hospital up for unnecessary penalties. To fix that, the hospital’s director of quality initiatives manually corrected the data in an Excel spreadsheet, which was time-consuming and inefficient. As part of the quality initiatives, that process was automated to produce more accurate data, Mays says.

Western Maryland also developed a care coordination team responsible for following up on high-utilization patients after discharge, using a call list of patients who met specific criteria for outreach. The hospital discovered discrepancies in discharge information between systems, so it created a discharge discrepancy report that could be used to resolve inconsistencies. Care managers also began reviewing mismatches during morning huddles, Mays says.

“Providing more data integrity and making it possible to reconcile those discrepancies gave the care managers much more ability to make sure people didn’t slip through the cracks and not receive the kind of discharge follow-up that keep people from being readmitted,” Mays says. “It was an example of how issues with data and data analytics can put a hospital’s best efforts in an area like this at a disadvantage if those issues are not addressed.”

The hospital also created a discharge clinic that patients could visit to ensure they understood their medications and were taking them appropriately.

Better use of big data helped the hospital lower its readmission rate to 11.72%, below the state average of 13.9%. Western Maryland also went from last place to first place in the state rankings of hospitals based on quality-based reimbursement measures.

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