



Fig. 1 Timeline showing percentage of hospitalizations in primary joint replacement that involved a blood transfusion.

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MARCQI Demonstrates Value and Impact of Registries

In Michigan, quality initiatives based on shared data deliver impressive results

In the context of the U.S. government, the nation’s states are sometimes called the “laboratories of democracy.” Ideas often are tested in single states, and results may predict how programs might fare nationally.

In orthopaedics, that concept might apply to the context of national registries. As the American Joint Replacement Registry (AJRR) continues to evolve and take its place among its more established international peers, the Academy’s own ambitious plan to create a family of registries across orthopaedics is proceeding. A registry consortium in a single state, Michigan, demonstrates the palpable benefits of systematic data collection.

Specifically, a registry-affiliated quality-improvement initiative to reduce blood transfusions after arthroplasty procedures in the Great Lakes State resulted in the transfusion rate decreasing from an all-joint average of 15 percent to 1.6 percent in about four years.

The Michigan Arthroplasty Registry Collaborative Quality Initiative (MARCQI) operates under the umbrella of 18 statewide collaborative quality initiatives (CQIs) encompassing major medical specialties and focus areas. Funding is provided by Blue Cross Blue Shield of Michigan, but the insurer does not receive patient- or provider-level data from the CQIs.

MARCQI is collaborative, comprising 67 Michigan sites (hospitals and ambulatory surgical centers). It contains cases performed by 525 surgeons. Covering about 96 percent of orthopaedic cases in the state, MARCQI has collected data from more than 220,000 surgeries since its launch six years ago and currently adds 49,000 cases per year. MARCQI helps provide access to national benchmarking capabilities by assisting its participants with data submission to AJRR when they request it.

Along with the other collaboratives, MARCQI is organized “in a unique way that is critical to its success,” according to the organization’s initial five-year report. The registry-driven affiliation “requires an environment of trust and transparency that many providers, hospitals, and payers have not experienced before. The providers managing participation in the CQI control the data and decide how to use it for improvement.”

For the registry mechanism, each hospital in MARCQI has at least one clinical data abstractor (CDA) and a designated clinical champion. The CDA abstracts data from hospital records for each qualifying patient and enters them into an online database that constitutes the patient registry. Each clinical champion is responsible for providing leadership for MARCQI activities at the hospital and within the community of surgeons practicing at the hospital.

To promote the collaborative environment among surgeons and/or hospitals, participants agree not to use the data for anything other than quality improvement, and data may not be used for marketing purposes. The relative performance of sites is not shared beyond participants, which “allows for transparency and collaboration inside the project and significantly increases the effectiveness of improvement efforts,” MARCQI reported.

The “robust, clinically meaningful data” enable hospitals and providers to improve quality, according to MARCQI. The large sample size attained by data flowing from multiple sites is “especially beneficial to understanding the risk factors and best practices associated with significant yet infrequent complications such as venous

thromboembolism (VTE) and infections.” Case in point: Registry data guided the initiative to reduce transfusions in Michigan.

Collaborating for improvement

Along with its foundation of registry data, “the key to MARCQI is collaboration,” said Brian Hallstrom, MD, codirector (with Richard Hughes, PhD) of the initiative. He explained that participants meet in person several times per year and review data in a transparent way.

Dr. Hallstrom presented the MARCQI story at an AAOS 2018 Annual Meeting symposium titled “What Can a Registry Do for Me?”

“Working together allows us to complete the loop in quality improvement,” Dr. Hallstrom said. “Rather than having data moving in one direction, we have it going in a circle, where we can review it together and learn from it. Three or four times a year, more than 50 orthopaedic surgeons from across the state—many of them direct competitors with the person sitting next to them—get together and collaborate and try to improve our patients’ care.

Over its first six years, MARCQI took on several quality-improvement projects, including those that sought to achieve reductions in VTE, readmissions, infections, dislocations, discharges to nursing homes, emergency department visits, and opioid usage, while seeking to improve quality, satisfaction, and value.

Courtesy of MARCQI

Taming transfusions

The effort to reduce perioperative blood transfusions began in 2013, when data plots showed that “we had huge variation in the use of transfusion across the state,” Dr. Hallstrom said. Some hospitals had transfusion rates of 9 percent of cases, with some as high as 38 percent. The average rate was more than 15 percent, with an average of 2.1 units given per transfusion. At the start, tranexamic acid (TXA) was used in fewer than 5 percent of cases. “We talked about this variation at our quarterly meeting,” he recalled. “We looked at the evidence about transfusion and the risk, reviewed best practices, and made some recommendations.”

Among the recommendations: Sites should screen for and treat preoperative anemia, work on reducing blood loss, and adopt transfusion guidelines.

“We polled hospitals across the state and found that most did not have any formal protocol or guidelines,” Dr. Hallstrom said. “We offered the American Red Cross guidelines: to give blood only if hemoglobin is above 8 g/dL and to only give one blood unit at a time.”

After the transfusion initiative, at the last data reporting, the average Michigan transfusion rate is down to 1.6 percent for all joints, with the range running from zero at some hospitals for elective procedures to 10.7 percent at others (Fig. 1 on page 21).

Separately, for total knees in Michigan, the MARCQI rate was 0.9 percent versus 4.4 percent reported nationally, and for total hip, the rate was 2.9 percent in Michigan versus a national rate of 8.7 percent.

“Most important,” Dr. Hallstrom said, “we’ve essentially eliminated unnecessary transfusions in patients with hemoglobin above 8 g/dL, because the risks outweigh the benefit in the vast majority of cases. In 2013, one of every three transfusions was given to a patient whose hemoglobin was above 8 g/dL. Now that is one in 11 transfusions.”

Regarding TXA, Dr. Hallstrom said he and his colleagues knew that its use was associated with fewer transfusions after hip and knee replacements. Reviewing the Michigan registry data, “We were a little surprised that it was associated with fewer readmissions after total hip replacements and fewer blood clots after total knee arthroplasty. And we saw fewer VTEs after total knee arthroplasty.”

Notably, Dr. Hallstrom said, “It was not associated with any of the risks that you might be worried about—no increased risk of VTE, cardiovascular events, or stroke. We saw the use of TXA in Michigan rise from 5 percent in 2013 to 91 percent in 2017.”

Dr. Hallstrom said the Michigan initiatives fall in line with the national trend of placing priority on value. “The advantage of each of the programs in MARCQI is that in using registry data, we can really affect both sides of the value equation. Transfusions are expensive and have complications. Our estimate is that in 2016, we saved \$4 million across Michigan on this project alone.”

For those asking, “What can a registry do for me?” Dr. Hallstrom said MARCQI is an example that “we can use a registry as a quality-improvement project. It allows us to collaborate and increase the power of the data that each of us has. We can look at it

together and identify variation, share best practices, and improve care across all sites, rather than operate with a focus on penalties.”

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References

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