CQI VALUE ASSESSMENT

MSSIC Efforts Contribute to Estimated $6.6+ Million in Cost Savings from Reduction in Surgical Site Infections After Spine Surgery

December 2025

AT A GLANCE

About MSSIC

- Funded by BCBSM Value Partnerships
- Works to improve the quality of spine surgery in Michigan
- Supports 32+ sites

QI Tools for SSI

- P4P and VBR incentive performance measures and related reporting
- Coaching and support
- Resources for patient and provider education

"When we combine data from the MSSIC registry on changes in complication rates over time with data from MVC on costs of care for those patients, we can see clearly how quality improvement can lead to significant cost savings."

- Jamie Myers, BSN, RN
MSSIC Program Manager

Michigan Value Collaborative

MSSIC
MICHIGAN SPINE SURGERY IMPROVEMENT COLLABORATIVE

Blue Cross Blue Shield Blue Care Network of Michigan

Nonprofit corporations and independent licensees of the Blue Cross and Blue Shield Association

BACKGROUND

The Michigan Spine Surgery Improvement Collaborative (MSSIC) is a statewide quality improvement collaborative involving orthopedic surgeons and neurosurgeons with the aim of improving the quality of spine surgery in Michigan. MSSIC supports a registry that allows all participating hospitals and surgeons to see their performance relative to peers on a variety of process and outcome metrics. They also host three collaborative-wide meetings per year to support quality improvement (QI) among members.

Analyses of MSSIC registry data in 2015-2016 suggested early ambulation (defined as up and moving within eight hours of surgery) was associated with reductions in the rate of three specific adverse events: surgical site infections (SSI), hospital readmissions within 90 days of discharge, and post-operative urinary retention (POUR). In 2017, MSSIC began working with hospitals in Michigan to increase rates of early ambulation and reduce the rate of adverse events or complications after spine surgery.

MSSIC first partnered with the Michigan Value Collaborative (MVC) in 2021 to evaluate the impact of this work, and at that time estimated $16M in direct cost savings to payers due to fewer SSIs, readmissions, and POUR events. Following several years of additional QI work, MSSIC and MVC came together in 2025 to update prior cost savings estimates using MVC's most recent medical insurance claims data for spine patients in Michigan, this time adding Medicaid to the payer mix. This summary highlights findings specifically related to SSI.

MSSIC Strategies to Support Sites in Reducing Lumbar SSI

While a small percentage of MSSIC sites implemented QI initiatives to reduce lumbar SSI from 2017–2019, formalized lumbar SSI performance measures were first established in MSSIC's BCBSM pay-for-performance and value-based reimbursement programs in 2020 and continued through 2023. SSI measures were similarly adopted by other BCBSM CQIs (e.g., MSQC) as well as CMS for other procedures. MSSIC also offered its sites additional coaching, resources, and sometimes performance improvement plans to support site-specific improvement. This resulted in sites implementing a variety of strategies such as comprehensive presurgical education for patients on infection prevention, more standardized and granular post-discharge instructions on home wound care, post-discharge phone assessments within seven days of discharge that included questions specific to wounds, administering cefazolin for presurgical antibiotic prophylaxis, glycemic control before and after surgery, and nurse supervised or administered chlorhexidine gluconate wipes in preop.

METHODOLOGY

At the outset of this updated analysis, MSSIC provided MVC with a dataset of lumbar and cervical spine patients that included the presence or absence of SSI complications as abstracted from medical records. Spine patients were matched to the MVC analytic tables and spine cohort for Medicare Fee-For-Service (FFS), Medicaid, Blue Cross Blue Shield of Michigan (BCBSM) Commercial, BCBSM Medicare Advantage (MA), Blue Care Network (BCN) Commercial, and BCN MA claims.

Support for the Michigan Value Collaborative is provided by Blue Cross Blue Shield of Michigan and Blue Care Network as part of the BCBSM Value Partnerships program. Although BCBSM/BCN and MVC work in partnership, the opinions, beliefs, and viewpoints expressed by MVC do not necessarily reflect the opinions, beliefs, and viewpoints of BCBSM/BCN or any of its employees.

Matching Methodological Approach

The MVC Coordinating Center was tasked with matching MSSIC's patients to MVC episodes, providing descriptive statistics on the population, and performing analyses of episode payments with and without adverse events. To achieve this, MVC implemented a stepwise, deterministic match to link MSSIC patients to MVC data using birth date, admission date, discharge date, gender, and hospital of surgery. Patients with index admissions from Dec. 28, 2016, to Nov. 29, 2024, were included in the matched cohort.

Of the MVC records, 32,483 were matched to MSSIC cases, giving a raw match rate of 48%. MSSIC's sampling strategy resulted in the collection of roughly 60% of spine surgeries. Assuming MVC has all spine surgeries for its payer population, the MVC denominator should be reduced by 40% in order to better estimate the match rate. This results in an adjusted denominator of 40,611 which yields a match rate of 80%. Descriptive statistics were calculated to verify the generalizability of the matched population. MVC also evaluated the matched population for readmission status and price-standardized facility payments associated with SSI. MVC and MSSIC used the rates of adverse events pre- and post-QI to estimate the number of events averted. MVC payment data was then used to calculate cost savings from averted events.

Limitations

Not all MSSIC patients were identifiable in the MVC data due to differing definitions of the spine surgery cohort and a lack of patient identifiers. The matched cohort used in MVC's analysis represents lumbar and cervical spine patients, but the SSI baseline rate is for lumbar spine patients only; due to very low incidences of SSIs following cervical procedures, MSSIC did not focus on the cervical population. Payment averages were calculated using price-standardized payments to the Medicare FFS schedule, which may underestimate total cost savings. Cost savings estimates also did not include professional payments and are therefore likely understated.

FINDINGS

The analysis revealed statistically significant reductions in the rates of SSI and readmissions from the 2019 baseline year to the 2020-2024 post-intervention period. MVC and MSSIC estimated 301 SSI events were averted (Table 1). Using the MVC-based estimate of 62.6% of SSI events also involving readmission, MVC and MSSIC estimated that 188 readmissions were averted.

Table 1. Rates of SSI Events Averted Through QI Initiatives, 2019-2024

Metric	SSI
2019 Baseline Rate	2.27%
2020 - 2024 Average Rate (post intervention)	1.87%
Absolute Difference	0.40%
Number of Cases Affected by QI	75,301
SSI Events Averted	301

Table 2. Calculation of Additional Inpatient Diagnosis-Related Group (DRG) Payments Based on Complications and Comorbidities (CC) by SSI Status

Category	Average Payment	No SSI (31,951)	SSI (529)
No CC	$23,285	56.35%	49.46%
With CC	$27,236	36.89%	40.00%
With major CC	$40,505	5.61%	7.84%
Other DRG	$33,194	1.15%	2.70%
Average Payments			
Weighted Average Payments		$25,823	$26,483
Additional DRG Payment Associated with SSI		$660	

Table 3. Calculation of Post-Discharge Outpatient Payments Associated with SSI

Post-Discharge Price-Standardized Payment Metric	No SSI (31,951)	SSI (198)	SSI w Readmission (331)
Average Payment	$1,801	$4,029	$34,786
Weighted Average Payment for Patients with SSI	$23,274		
Average Payment for Patients without SSI	$1,801		
Additional Average Payment Associated with SSI	$21,473		

To estimate cost savings from averted SSI events, MVC completed a comparative analysis of diagnosis-related group (DRG) and post-discharge payments among patients with no SSI compared to those with SSI events. The results of the analysis of higher inpatient DRG payments (Table 2) showed that weighted average DRG payments for patients without SSI were $25,823; the weighted average payments for those with SSI was $26,483, a difference of $660 per patient.

Looking at post-discharge payments (Table 3), MVC found that the average payment for a patient without SSI was $1,801. The weighted average payment for those with SSI (62.6% with readmission and 37.4% without readmission) was $23,274, a difference of $21,473 between patients with SSI and those without.

The estimated total direct cost savings to payors from SSI rate reductions in January 2020 to August 2024 were $6,662,033 based on additional inpatient and outpatient costs of $22,133 per event multiplied by 301 averted SSI events. These findings demonstrated that MSSIC efforts delivered significant net savings for its BCBSM sponsor and healthcare providers in Michigan.