



2019 Denver Health Quality, Safety, and Service Annual Report



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To the Denver Healthcare Community

Our commitment to the communities we serve is to provide reliable high quality and safe care and outstanding service at every point of contact to Denver Health. To fulfill this commitment, we must continuously evaluate and improve our services. We are proud to present our 2019 Quality, Safety, and Service Annual Report. Our intent is to present a year-end summary of our quality, safety and service initiatives and associated outcomes as well as key results of publicly reported performance measures. As the local, regional, and national landscape of healthcare quality measurement becomes more complex, we hope this will be a resource to all who care to track Denver Health's successes and opportunities. In the spirit of our education mission, we hope it will serve as a valuable resource for both internal and external safety and quality measures. Most importantly, we hope the report will drive ongoing efforts to improve the value of the services we provide.

Department of Patient Safety and Quality Mission

To eliminate patient harm and maximize healthcare quality, value, and experience.

Department of Patient Safety and Quality Goals

1. Foster a culture that supports continuous quality improvement, safety event learning, and waste reduction.
2. Use health system data to drive care improvements and high reliability.
3. Put patients and family at the center of everything we do.

EXECUTIVE SUMMARY

- Denver Health Medical Center ended 2019 with significant reductions in hospital acquired conditions as measured by the enterprise metric Target Zero. Compared to 2018, DHHA experienced 13% fewer events, marking 4 consecutive years of reductions. Compared to 2015, DHHA experienced 47% fewer Target Zero events, including 50% or more reductions in individual counts of CLABSI, Injury Falls, and Medication Safety events over the four year period.
- For the 4th consecutive year of the CMS Readmissions Reduction Program, DHHA performed in the best quartile of U.S. hospitals in its peer group.
- Resulting from substantial reductions in specific infections and other hospital acquired conditions, DHHA avoided a \$300,000 penalty from the CMS Hospital Acquired Conditions Reduction program for the first time in 4 years.
- Denver Health surpassed the Colorado and national averages for the first time in the CMS Value Based Purchasing Program, and earned back more than the withhold resulting in a 0.7% incentive bonus on Medicare FFS hospital payments.
- DHHA exceeded its stretch goal in 4 of 6 components of the Severe Sepsis / Septic Shock Early Management Bundle.
- For the 3rd consecutive year, 0% of pregnant women had an elective delivery between 37 and 39 weeks gestation.
- A DHHA record of 59% of newborns were exclusively fed breast milk during their inpatient stay.
- Process improvements by the Behavioral Health Department resulted in a substantial increase in those offered substance abuse treatment at discharge among patients screening positive for alcohol or drug use disorders.
- For the Colorado Medicaid Hospital Quality Incentive Program (HQIP), DHHA received a record 82% of eligible points, resulting in a \$8.2 million incentive payment.
- For the 2nd time in the history of the score, DHHA received a letter grade of “A” on the Leapfrog Hospital Safety Grade, a designation awarded to fewer than 1/3 of 2,600 U.S. hospitals.
- For the 3rd consecutive year, the NICU experienced zero cases of necrotizing enterocolitis for very low birth weight infants.
- Mortality rates for blunt multisystem trauma patients was in the best decile of trauma centers nationwide according to the American College of Surgeons Trauma Quality Improvement Program.
- Nursing post-intervention pain reassessments increased by 25% in 2019.
- Through a series of diagnosis focused interventions, DHHA reduced the average length of stay index for hospitalized patients from 1.20 pre-intervention to 1.02 post-intervention.
- DHHA’s rapid response system (RRS) was redesigned to incorporate a multi variable early warning score called the deterioration index (DI) and the implementation of a rapid response team (RRT).
- Resulting from multifaceted interventions and relentless attention to prevention, DHHA experienced a 33% reduction in total falls from 2016 and 2019.
- The clinical teams in Ambulatory Care Services achieved target goals for persistent asthmatic patients on controller medication, depression screening, and weight assessment and counseling for pediatric patients.
- The Hospital Lab and Ambulatory – Community Health Services were accredited by the Joint Commission in 2019.
- Hand washing performance exceeded the goal of 85% for the first time in 2019.
- DHHA experienced zero CLABSIs on the MICU, PICU, and PCU, and had a 55% reduction hospital-wide compared to 2018.
- *Clostridioides difficile* infections decreased by 40%, going from 81 infections in 2018 to 49 infections in 2019.
- Inpatient experience scores improved significantly in 2019 for two critical target areas: doctor courtesy and respect and nurse courtesy and respect, which both exceeded targets.
- The physician CDI query response rate exceeded the target of 90% for every month in 2019.
- CDI averted 27% of the PSI’s/HAC’s reviewed.
- The overall surgical site infection Standardized Infection Ratio for DHHA procedures was less than 1 for 7 of the last 8 quarters.
- For 12 consecutive quarters, DHHA’s Standardized Antibiotic Administration Ratio (SAAR) reflecting observed to expected overall antibiotic use has been less than 0.9 for both adults and pediatrics and in 2019 was 0.8 for adults and 0.6 for pediatrics.

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1. PUBLIC REPORTING & INCENTIVES

1.1. CMS Hospital Readmissions Reduction Program—FFY2020

The Affordable Care Act established the Hospital Readmissions Reduction Program requiring the Centers for Medicare and Medicare Services (CMS) to reduce payments to inpatient hospitals with excess readmissions starting in federal fiscal year (FFY) 2013. CMS utilizes claims data to determine readmissions within 30 days of discharge from the same or another inpatient hospital. CMS implemented a socio-demographic status adjustment beginning in FFY 2019.

- **Applicable Conditions** — acute myocardial infarction (AMI), heart failure (HF), pneumonia (PN), acute exacerbation of chronic obstructive pulmonary disease (COPD), elective total hip and total knee arthroplasty (THA/TKA) and coronary artery bypass graft (CABG) surgery.
- **Inclusion Criteria** — Medicare Fee-For-Service (FFS) beneficiaries with Part A and Part B coverage who have continuous enrollment for the 12 months prior to admission to at least one month after discharge. Beneficiaries must be 65 years or older at admission.
- **Exclusion Criteria** — length of stay over 365 days, in-hospital death, left against medical advice, transferred to another acute care hospital, planned readmissions.
- **Excess readmission ratios** are risk-standardized for clinically relevant factors, such as patient demographic characteristics, comorbidities, and frailty.
- **Hospitals are grouped into quintiles** based on their ratio of full-benefit dual eligible patients (Medicaid and Medicare) to total Medicare FFS and Medicare Advantage patients. Hospitals are compared to the condition-specific median excess ratio within their quintile.
- **Claims data** are snapshot approximately 90-days after the performance period ends.
- **Financial Impact**
 - ◇ 3.0% maximum payment reduction, i.e. potential \$400,000 loss for Denver Health and Hospital Authority (DHHA).
 - ◇ Reduction applies to the Base Operating DRG payment amount (including wage-adjustment and new technology amounts) for discharges of Medicare FFS patients.
 - ◇ DHHA will be penalized -0.09% for FFY 2020 discharges, which is estimated as a \$12,000 loss (Figure 1.1-1).
 - ◇ This was the largest penalty received by DHHA in the seven year program, but it is far less than the maximum penalty (Figure 1.1.-2).
 - ◇ DHHA ranked in the best quartile of hospitals in its peer group.
- **PI Activities**
 - ◇ Continuation of an enterprise-wide patient flow initiative with executive oversight targeting all aspects of patient flow.
 - ◇ Readmission prevention was chosen as a 2020 tactic for Quality, Safety, and Service.

0.09% reduction

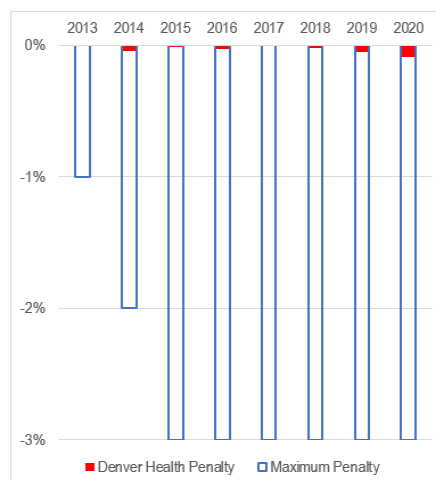
Figure 1.1-1: CMS Hospital Readmissions Reduction Program FFY 2020*

Condition	DHHA Number of Eligible Discharges	DHHA Readmission Rate	National Readmission Rate	Excess Readmission Ratio
Acute Myocardial Infarction	41	31.7%	15.3%	1.1041
Chronic Obstructive Pulmonary Disease	50	22.0%	19.5%	0.9906
Heart Failure	85	18.8%	21.4%	0.9723
Pneumonia	63	19.0%	16.6%	1.0105
Total Hip and Total Knee Arthroplasty	14	7.1%	4.0%	1.0259
Coronary Artery Bypass Graft Surgery	0	N/A	N/A	N/A
Financial Impact	-\$12,000[†]			

* Performance Period 7/1/15-6/30/18

[†] Estimated

Figure 1.1-2: DHHA Performance on CMS Hospital Readmissions Reduction Program



1.2. CMS Hospital-Acquired Conditions (HAC) Reduction Program—FFY 2020

The Affordable Care Act established the Hospital-Acquired Conditions (HAC) Reduction Program to encourage hospitals to reduce preventable conditions that patients did not have upon admission to the hospital, but which developed during the hospital stay. Hospitals ranking in the lowest-performing quartile with respect to risk-adjusted HAC quality measures received a payment reduction beginning in FFY 2015. CMS publicly reports hospital-specific results on its Hospital Compare website. Beginning in the FFY 2020 program, CMS discontinued domains and adopted an equal measure weights approach.

Measures

- ◇ Agency for Healthcare Research and Quality (AHRQ) Patient Safety and Adverse Events Composite: weighted average of the risk- and reliability-adjusted versions of 10 Patient Safety Indicators (PSIs). Figure 1.2-1 lists the PSIs in this modified PSI-90 measure. CMS is using version 9.0 of the AHRQ PSI software, and hospitals' Medicare FFS claims for discharges during the performance period.
- ◇ Healthcare-Associated Infections (HAI): HAIs are identified by our Infection Prevention department through chart-abstracted surveillance data and reported to the Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN). Standardized infection ratios (SIRs) provide risk-adjustment at hospital- and patient-care unit levels.

Figure 1.2-1: AHRQ Patient Safety and Adverse Events Composite, Modified PSI-90 Measure

PSI 03—Pressure Ulcer Rate
PSI 06—Iatrogenic Pneumothorax Rate
PSI 08—In-Hospital Fall with Hip Fracture Rate
PSI 09—Perioperative Hemorrhage or Hematoma Rate
PSI 10—Postoperative Acute Kidney Injury Requiring Dialysis Rate
PSI 11—Postoperative Respiratory Failure Rate
PSI 12—Periop Pulmonary Embolism or Deep Vein Thrombosis Rate
PSI 13—Postoperative Sepsis Rate
PSI 14—Postoperative Wound Dehiscence Rate
PSI 15—Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate

Financial Impact

- ◇ 1% maximum payment reduction in FFY 2020 if total HAC Score above 75th percentile, i.e. potential \$300,000 loss for DHHA.
- ◇ Reduction applies to the Base Operating DRG payment amount after adjustments have occurred for the Hospital Value-Based Purchasing and Readmissions Reduction Programs for discharges of Medicare FFS patients.
- ◇ DHHA was not penalized for the FFY 2020 program (Figures 1.2-2 and 1.2-3).

PI Activities

- ◇ DHHA's Clinical Documentation Integrity (CDI) team reviewed all PSI events to determine if the event was due to a coding error, inaccurate documentation, or true HAC.
- ◇ For efforts to reduce HAIs, see the Infection Prevention section of this report.

Figure 1.2-2: CMS Hospital-Acquired Conditions Reduction Program FFY 2020

Measure	Result	Contribution to Total HAC
AHRQ PSI 90 Composite*	1.019	0.0370
Central Line-Associated Bloodstream Infection (CLABSI) SIR†	0.921	0.0643
Catheter-Associated Urinary Tract Infection (CAUTI) SIR†	0.705	-0.0326
Surgical Site Infection- colon and abdominal hysterectomy SIR†	0.969	0.0475
Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) bacteremia SIR†	0.286	-0.1565
<i>Clostridioides difficile</i> infections SIR†	0.832	0.0600
Total HAC Score		0.0198

* Performance period 7/1/16—6/30/18.

† Performance period 1/1/17—12/31/18.

Figure 1.2-3: Denver Health Performance on CMS Hospital-Acquired Conditions Reduction Program

Program Year	Subject to 1% Payment Reduction	Financial Impact
FFY 2015	No	\$0
FFY 2016	Yes	-\$295,053
FFY 2017	Yes	-\$296,679
FFY 2018	Yes	-\$300,621
FFY 2019	Yes	-\$308,138
FFY 2020	No	\$0

Payment Reduction Threshold ≥ 0.3306

1.3. CMS Quality Payment Program (QPP)—FFY 2021

In January 2017, CMS implemented the Quality Payment Program (QPP) to reward high value, high quality Medicare clinicians with payment increases while simultaneously reducing payments to clinicians with subpar performance. Clinicians may participate in the Quality Payment Program (QPP) via the Merit-based Incentive Payment System (MIPS) or Advanced Alternative Payment Models (APMs). As a large enterprise with a single Medicare Tax Identification Number (TIN), DHHA chose to participate in MIPS as a group practice. DHHA is considered non-patient facing for QPP because over 75% of the eligible clinicians billing under the group’s TIN had less than 200 Medicare FFS patient facing encounters in the performance period. This program is based on Medicare Part B professional services paid under the Physician Fee Schedule (PFS).

The QPP program is evolving every year and a few of the major changes are shown below (Figure 1.3-1). In 2019, CMS added seven allied health clinician types to the program. As the program has progressed, the weight of the Quality Performance Category decreased in order to shift weight to the Cost Performance Category. Episode-based cost measures returned to the program in 2019. The scoring methodology changed to performance-based scoring at the measure level. The performance threshold to avoid a penalty doubled and the performance payment adjustment increased two percent (Figure 1.3-2).

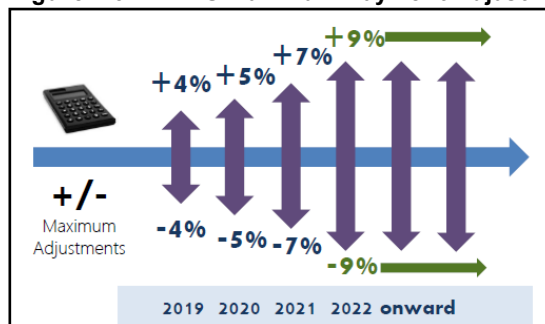
Figure 1.3-1: CMS Quality Payment Program Major Changes by Program Year

	Year 1 Reporting Year 2017 Payment Year 2019	Year 2 Reporting Year 2018 Payment Year 2020	Year 3 Reporting Year 2019 Payment Year 2021
Eligible Clinicians	Physician, Physician Assistant, Nurse Practitioner, Clinical Nurse Specialist, Certified Registered Nurse Anesthetist	Same as Year 1	Added Physical Therapist, Occupational Therapist, Speech-Language Pathologist, Audiologist, Clinical Psychologist, Registered Dietician or Nutritional Professional
Low-Volume Threshold Exclusion Medicare Part B charges for professional services Medicare Part B beneficiaries Medicare Part B professional services under PFS	≤ \$30,000 charges or ≤ 100 beneficiaries —	≤ \$90,000 charges or ≤ 200 beneficiaries —	≤ \$90,000 charges or ≤ 200 beneficiaries or ≤ 200 services
Performance and Exceptional Performance Thresholds	3 points / 70 points	15 points / 70 points	30 points / 75 points
Performance Payment Adjustment	- 4% up to + 4% x scaling factor*	- 5% up to + 5% x scaling factor*	- 7% up to + 7% x scaling factor*
Exceptional Performance Payment Adjustment	0.5% up to + 10% x scaling factor*	Same as Year 1	Same as Year 1
Category Weights			
Quality	60%	50%	45%
Promoting Interoperability †	25%	25%	25%
Improvement Activities	15%	15%	15%
Cost	0%	10%	15%
Scoring Methodology for Promoting Interoperability †	Base, Performance, and Bonus scores	Same as Year 1	Performance-based scoring at the measure level
Measures for Cost Performance Category	Medicare Spending per Beneficiary, Total per Capita Cost, 10 Episode-based Cost measures	Medicare Spending per Beneficiary, Total per Capita Cost	Medicare Spending per Beneficiary, Total per Capita Cost, 8 new Episode-based Cost measures

* Scaling factor to achieve budget neutrality: not to exceed 3 for Performance and not to exceed 1 for Exceptional Performance

† Performance category was called Advancing Care Information in 2017

Figure 1.3-2: MIPS Maximum Payment Adjustments



Source: CMS

1.3. CMS Quality Payment Program (QPP)—FFY 2021

DHHA has preliminarily received 85.5 of 100 points, without accounting for up to 15 points in the cost category (Figure 1.3-3). This score qualifies for the Exceptional Performance Bonus. The Cost Performance Category results will be released by CMS in the summer of 2020.

Financial Impact

- Between -7.0% and 21% payment adjustment (based on the scaling factor) will be applied to all Medicare Part B allowed charges for professional services paid under PFS for FY 2020.

Figure 1.3-3: CMS Quality Payment Program FFY 2021 — Denver Health Group Practice Submission

Quality (45%)					
Quality ID	Measure	Performance Rate	Performance Points*	Bonus Points	Category Score†
066	Appropriate Testing for Children with Pharyngitis	95.0%	10	2 ^{H,E}	63.83 achieved = 60 possible 106%*45 weight = 47.9 → 45 max 45
008	Heart Failure: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction	98.6%	9.61	1 ^E	
239	Weight Assessment and Counseling for Nutrition and Physical Activity for Children & Adolescents	76.4%	10	1 ^E	
310	Chlamydia Screening for Women	66.6%	10	1 ^E	
379	Primary Caries: Prevention Intervention as Offered by Primary Care Providers, including Dentists	25.6%	10	1 ^E	
001	Diabetes: Hemoglobin A1c Poor Control (>9%)	34.9%	6.55	n/a	
065	Appropriate Treatment for Children with Upper Respiratory Infection	91.4%	n/a	1 ^H	
191	Cataracts: 20/40 or Better Visual Acuity within 90 Days Following Cataract Surgery	92.5%	n/a	2 ^H	
236	Controlling High Blood Pressure	58.2%	n/a	1 ^H	
240	Childhood Immunization Status	46.6%	n/a	1 ^E	
305	Initiation and Engagement of Alcohol and Other Drug Dependence Treatment	0.68%	n/a	1 ^H	
Promoting Interoperability (25%)					
Objective	Measure	Perform. Rate	Perform. Rate	Bonus Points	Category Score
Security Risk Analysis	Complete a Security Risk Analysis	Yes	n/a	n/a	Performance: 77 Bonus: 5 77 + 5 = 100 possible 82%*25 weight = 20.5 20.5
Electronic Prescribing	E-prescribing (query drug formulary and transmit electronically)	95.3%	10 / 10	n/a	
	Query of Prescription Drug Monitoring Program	No	n/a	0	
	Verify Opioid Agreement for Patients on Schedule II Opioid	24.2%	n/a	5	
Health Information Exchange	Support Electronic Referral Loops by Sending Health Information	47.9%	10 / 20	n/a	
	Support Electronic Referral Loops by Receiving and Incorporating Health Information, i.e. clinical information reconciliation	58.0%	12 / 20	n/a	
Provider to Patient Exchange	Provide Patients Electronic Access to Their Health Information	87.2%	35 / 40	n/a	
Public Health and Clinical Data Exchange	Active engagement with two registries	Yes	10/10	n/a	
Improvement Activities (15%)					
Improvement Activity		Priority	Points	Bonus Points	Category Score
Implementation of Co-Location Primary Care Providers and Mental Health Services		High	40	n/a	180 achieved = 40 possible 4.5*15 weight = 67.5 → 15 max 15
Collection and Follow-up on Patient Experience and Satisfaction Data on Beneficiary Engagement		High	40	n/a	
Participation in an AHRQ-listed Patient Safety Organization		Medium	20	n/a	
Regularly Assess the Patient Experience of Care Through Surveys, Advisory Councils and/or Other Mechanisms		Medium	20	n/a	
Transforming Clinical Practice Initiative (TCPI) Participation		Medium	20	n/a	
Federally Qualified Health Center (FQHC) Quality Improvement Activities		High	40	n/a	
Cost (15%)					
Measure		Perform. Rate	Perform. Points	Bonus Points	Category Score
Medicare Spending per Beneficiary		TBD	TBD	n/a	TBD with max score of 15
Episode-Based Cost Measures		TBD	TBD	n/a	
Additional Bonus for Complex Patients		n/a	n/a	5	5
OVERALL SCORE = (45 + 20.5 + 15 + cost score + 5 bonus) / 100 = 85.5% plus cost points					

* Performance points are based on the benchmark deciles with the best decile receiving 10 points. ^E End-to-End electronic reporting. ^H High Priority Measure. Only the top six measures are included in the performance points.
 † Performance and Bonus points are capped at 100%

1.4. CMS Hospital Value-Based Purchasing (VBP) Program —FFY 2020

In October 2012, Medicare began incentivizing hospitals to provide high-quality care through the Hospital Value-Based Purchasing (VBP) Program. Incentive payments are based on either how well the hospital performs on each measure compared to other hospitals during a baseline period or how much the hospital improves its performance on each measure compared to its performance during the baseline period.

Financial Impact

- ◇ 2% payment withholding with the ability to earn back up to 3% based on performance.
- ◇ Payment reduction applies to the Base Operating DRG payment amount for Medicare FFS discharges.
- ◇ DHHA will receive a 0.27% incentive for FFY 2020 discharges, which is estimated as a \$35,000 gain (Figure 1.4-1).

Future Impact

- ◇ FFY 2021: COPD 30-day Mortality Rate, 30-day Episode of Care for AMI Payment and 30-day Episode of Care for Heart Failure Payment will be added to program. Updated cohort for Pneumonia 30-day Mortality Rate.
- ◇ FFY 2022: CABG 30-day Mortality Rate and 30-day Episode of Care for Pneumonia Payment will be added to program.
- ◇ FFY 2023: Modified AHRQ PSI-90 (Patient Safety & Adverse Event Composite) will return to program.

Figure 1.4-1: CMS Hospital Value-Based Purchasing Program - FFY 2020

Clinical Outcomes Domain (25%) Data Source: CMS Claims		Baseline Rate (7/1/10-6/30/13)	Performance Rate (7/1/15-6/30/18)	Achievement Threshold	Points*	Domain Points
MORT-30-AMI	Acute Myocardial Infarction (AMI) 30-Day Mortality Rate	0.858	0.874	0.854	9 (A)	9 / 20
MORT-30-HF	Heart Failure (HF) 30-Day Mortality Rate	0.887	0.881	0.881	0	
MORT-30-PN	Pneumonia (PN) 30-Day Mortality Rate	0.884	0.908	0.882	—	
THA/TKA	Elective Primary Total Hip or Knee Arthroplasty Complication Rate	0.035	0.024	0.032	—	
Person and Community Engagement Domain (25%) Data Source: HCAHPS		Baseline Rate (01/01/16-12/31/16)	Performance Rate (01/01/18-12/31/18)	Achievement Threshold	Points*	Domain Points
Communication with Nurses		72.0%	75.6%	79.1%	2 (I)	14 / 80 for metrics
Communication with Doctors		75.9%	75.4%	80.4%	0	
Responsiveness of Hospital Staff		53.5%	62.2%	65.1%	3 (I)	
Communication about Medicines		62.0%	63.6%	63.3%	1 (I/A)	
Hospital Cleanliness and Quietness		63.7%	59.6%	65.7%	0	14 / 20 for consistency
Discharge Information		84.3%	86.9%	87.4%	3 (I)	
Care Transition		41.7%	46.4%	51.1%	2 (I)	
Overall Rating of Hospital		66.2%	72.1%	71.6%	3 (I)	
HCAHPS Consistency (based on Cleanliness and Quietness)		63.7%	59.6%	n/a	14	
Safety Domain (25%) Data Source: CDC NHSN Standardized Infection Ratio and CMS Core Measures		Baseline Rate (01/01/16-12/31/16)	Performance Rate (01/01/18-12/31/18)	Achievement Threshold	Points*	Domain Points
CAUTI	Catheter-Associated Urinary Tract Infection	1.432	0.414	0.828	7 (I)	35 / 60
CLABSI	Central Line-Associated Blood Stream Infection	1.434	0.952	0.784	3 (I)	
CDI	<i>Clostridioides difficile</i> Infection	1.180	0.851	0.852	3 (I)	
MRSA	Methicillin-Resistant <i>Staphylococcus aureus</i> Bacteremia	1.500	0.365	0.815	7 (I)	
SSI-Abd hyst	Surgical Site Infection—Abdominal Hysterectomy	—	—	0.722	—	
SSI-Colon	Surgical Site Infection—Colon Surgery	2.206	0.965	0.781	5 (I)	
PC-01	Elective Delivery Prior to 39 Completed Weeks Gestation	0.015	0.000	0.000	10 (A)	
Efficiency and Cost Reduction Domain (25%) Data Source: CMS Claims		Baseline Rate (01/01/16-12/31/16)	Performance Rate (01/01/18-12/31/18)	Achievement Threshold	Points*	Domain Points
MSPB-1	Medicare Spending per Beneficiary	0.930	0.945	0.987	3 (A)	3 / 10

OVERALL SCORE = 25(9/20) + 25(28/100) + 25(35/60) + 25(3/10) = 40.3

(A) Achievement score higher. (I) Improvement score higher. (—) minimum case requirements not met.

1.4. CMS Hospital Value-Based Purchasing (VBP) Program —FFY 2020

In order to determine if DHHA has improved its value-based care, a hospital's Total Performance Score should be compared to state and national results. CMS has added, removed, and updated measures annually so a hospital cannot directly compare its performance year over year. In addition, CMS applies an automatic reduction to the Base Operating DRG payments to finance the VBP program and the reduction increased over the first five years of the program making it difficult to directly compare the financial impact.

Figure 1.4-2 shows DHHA's performance compared to the Colorado and national average scores. DHHA surpassed the national average score the past two years and surpassed the state average score for the first time in the FFY 2020 program. This improvement can be attributed to focused efforts on reducing hospital-acquired infections and avoiding elective deliveries prior to 39 completed weeks gestation. DHHA will receive an incentive payment of approximately \$35,000 in FFY 2020 (Figure 1.4-3).

Figure 1.4-2: CMS Hospital Value-Based Purchasing Program—Denver Health Compared to Colorado and National Averages

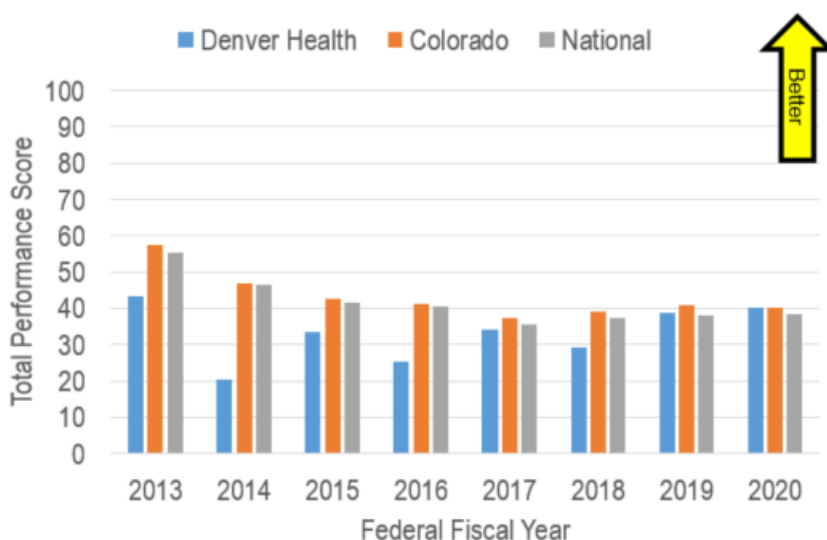


Figure 1.4-3: CMS Hospital Value-Based Purchasing Summary

Reporting Year	Base Operating DRG Payments			Financial Impact
	Automatic Reduction	DHHA Earned Back	DHHA Net Change	DHHA
FFY 2013	- 1.000%	0.793%	- 0.207%	- \$34,417
FFY 2014	- 1.250%	0.538%	- 0.712%	- \$107,256
FFY 2015	- 1.500%	1.297%	- 0.203%	- \$29,688
FFY 2016	- 1.750%	1.225%	- 0.525%	- \$74,583
FFY 2017	- 2.000%	2.104%	0.104%	\$15,443
FFY 2018	- 2.000%	1.687%	- 0.313%	- \$44,336
FFY 2019	- 2.000%	2.200%	+ 0.200%	\$27,000
FFY 2020	-2.000%	2.266%	+ 0.266%	\$35,000*

* Estimated

1.5 CMS Promoting Interoperability (PI) Programs

The American Recovery and Reinvestment Act (ARRA) of 2009 established incentive payments to eligible hospitals (EHs) and eligible providers (EPs) to promote the adoption and meaningful use (MU) of interoperable health information technology (HIT) and qualified electronic health records (EHRs). In 2018, CMS changed the program's name from EHR Incentive to Promoting Interoperability (PI). However, Medicaid in Colorado decided to maintain the EHR Incentive name for its program.

Successful participation in the program is based on meeting the thresholds for all objective measures and electronic submission of clinical quality measures (eCQMs). The criteria for successful participation in the EHR Incentive Program differs for EHs vs. EPs and for Medicare vs. Medicaid. DHHA participated in Stage 3 of the programs in 2019.

Hospitals can participate in both the Medicare and Medicaid programs. Medicare encouraged hospitals by offering incentive payments for participation and penalized those hospitals that did not submit data. Beginning in program year 2017, Medicare stopped providing incentive payments. Medicaid encouraged hospitals by providing incentive payments for the first three years of participation. DHHA currently only participates in the Medicare EH program because there are no penalties or remaining incentives with Medicaid.

In comparison, providers were required to select either the Medicare or Medicaid program (depending on their patient population). When possible, DHHA selected Medicaid for EPs because it provided incentive payments for participation whereas Medicare only penalized for lack of participation. DHHA's EPs could successfully demonstrate meaningful use to Medicare or Medicaid for the first time in 2016. In prior years, the EPs had only been able to show "adoption, implementation and upgrade."

■ Financial Impact

- ◇ DHHA has received incentive payments of approximately \$32.2 million from the EHR Incentive Program, with nearly \$12 million for the Eligible Hospital program and \$20 million for the Eligible Provider program (Figure 1.5-1).
- ◇ DHHA has avoided Medicare payment reductions of over \$3 million by participating in both the hospital and provider versions of the EHR Incentive Programs.

Figure 1.5-1: EHR Incentive / Promoting Interoperability Payments by Program Year

Program Year	Eligible Hospital (EH)		Eligible Provider (EP)	
	Medicare	Medicaid	Medicare	Medicaid
2012	\$0	\$4,501,504	n/a	\$4,632,500
2013	\$1,155,115	\$3,601,203	n/a	\$0
2014	\$916,026	\$900,301	n/a	\$2,231,250
2015	\$602,916	n/a	n/a	\$913,750
2016	\$233,047	n/a	n/a	\$5,682,250
2017	n/a	n/a	n/a	\$2,550,000
2018	n/a	n/a	n/a	\$2,320,500
2019	n/a	n/a	n/a	\$2,000,000*
Total Payment	\$2,907,104	\$9,003,008	n/a	\$20,330,250
Total Payment by Program	\$11,910,112		\$20,330,250	
Overall Financial Impact	\$32,240,362			

*Estimated

■ Future Impact

- ◇ DHHA will continue to participate in the Medicare Promoting Interoperability Program for Eligible Hospitals to avoid penalties.
- ◇ Providers currently enrolled in the Medicaid EHR Incentive program are eligible for up to six years of payments. The final year of the program is 2021.

1.5. CMS Promoting Interoperability (PI) Programs

Medicare Eligible Hospital Promoting Interoperability Program

DHHA’s hospital successfully participated in the Medicare Promoting Interoperability Program in 2019. This was the first year with the new performance-based scoring system for the Objectives, which replaced the prior threshold-based system. A minimum total score of 50 points is required to successfully pass the program and avoid a penalty. Performance on the objective measures is shown in Figure 1.5-2. The clinical quality measures are discussed in Section 1.6 (CMS/ The Joint Commission Clinical Quality Measures) and performance is shown in Figure 1.6-1.

Figure 1.5-2: Medicare Eligible Hospital Promoting Interoperability Program Objectives and Measures for 2019

Objective	Measure	DHHA Performance*	DHHA Points
Electronic Prescribing	E-Prescribing of Discharge Prescriptions	84.6% (39,152 / 46,276)	8 of 10
	Bonus: Query of Prescription Drug Monitoring Program (PDMP)	n/a	
	Bonus: Verify Opioid Treatment Agreement	n/a	
Health Information Exchange	Support Electronic Referral Loops by Sending Health Information — create a summary of care record and electronically exchange the record for transitions of care or referrals outside the system	12.6% (1213 / 9649)	18 of 20
	Support Electronic Referral Loops by Receiving and Incorporating Health Information — conduct clinical information reconciliation for medication, medication allergy, and current problem list for transitions or care, referrals into the system, or new patients	73.9% (15,754 / 21,313)	
Provider to Patient Exchange	Provide Patients Electronic Access to Their Health Information — Provide timely access to health information to view online, download and transmit to a third party and to access using an application of their choice	99.6% (20,072 / 20,153)	40 of 40
Public Health and Clinical Data Exchange	Choose two of the following options: a) Immunization Registry Reporting (bidirectional) b) Syndromic Surveillance Reporting (urgent care setting) c) Electronic Case Reporting d) Public Health Registry Reporting e) Clinical Data Registry Reporting f) Electronic Reportable Laboratory Result Reporting	d) CHORDS e) Vizient Clinical Data Base and Clinical Practice Solutions Center	10 of 10

*Reporting period is calendar year 2019.

76 points achieved so passed the program

PI Activity

- ◇ Enterprise-wide effort to encourage patients to sign up for MyChart and access their health information.
- ◇ Communication to the medical staff from the Chief Quality Officer and Chief Medical Information Officer about the importance of clinical information reconciliation and tip sheets on how to complete the process.

Future Impact

- ◇ CY 2020: CMS removed the Verify Opioid Treatment Agreement bonus measure, added an exclusion for Query of PDMP, and removed exclusions for Support Electronic Referral Loops by Receiving and Incorporating Health Information. CMS retired 8 electronic clinical quality measures (eAMI-8a, eCAC-3, eED-1, eED-3, eSTK-8, eSTK-10, ePC-01, eEHD-1a).
- ◇ CY 2021: CMS is adding an electronic clinical quality measure on Safe Use of Opioids—Concurrent Prescribing.

1.5. CMS Promoting Interoperability (PI) Programs Medicaid Eligible Provider EHR Incentive Program

The Department of Health Care Policy and Financing (HCPF) manages Colorado’s Medicaid program and it decided not to change the name of the EHR Incentive Program. HCPF accepts submissions for this program at least six months after the program ends, therefore the 2019 results are estimated. For each provider, a 90-day period was identified where the EP met the thresholds of all objective measures. Six eQMs which are related to the EP’s scope of practice were submitted. Figure 1.5-3 shows the percentage of providers compliant with each objective measure. Figure 1.5-4 shows the percentage of patients or encounters passing each quality measure during Q4 2019. This is preliminary data because providers who fail an objective measure in Q4 2019 may pass all objective measures in another 90-day period. Furthermore, eligibility for the 2019 Medicaid program has not been verified, i.e. must meet threshold for percentage of Medicaid patients and percentage of non-hospital based encounters. It is estimated that 235 EPs will attest to program year 2019, resulting in incentive payments of \$2,000,000.

Figure 1.5-3: Medicaid Eligible Provider EHR Incentive Program Objective Measures

Objectives	Measures	Threshold	Program Year 2019 Compliant Providers*
Protect Patient Health Information	Conduct a security risk analysis	Yes	100% (336/336)
Clinical Decision Support (CDS)	Implement CDS Interventions	5 CDS	100% (336/336)
	Implement Drug-Drug & Drug-Allergy Checks	Yes	100% (336/336)
Computerized Provider Order Entry (CPOE)	Medication orders using CPOE	>60% orders	99% (236/237)
	Laboratory orders using CPOE	>60% orders	99% (202/203)
	Diagnostic imaging orders using CPOE	>60% orders	97% (39/40)
Electronic Prescribing	Prescriptions queried for a drug formulary and transmitted electronically	>60% prescriptions	98% (176/179)
Patient Electronic Access to Health Information	Provide timely access for patient to view online, download, and transmit his or her health information, and allow patient to access the data using any application meeting the technical specifications of the Application Programming Interface (API)	>80% patients	89% (300/336)
	Provide patient-specific educational resources electronically	>35% patients	100% (336/336)
Coordination of Care through Patient Engagement (must meet 2 of 3 measures)	Patients view, download, or transmit to a third party their health information or access information through application chosen by patient and configured to API	>5% patients	89% (300/336)
	Secure message sent to patient	>5% patients	88% (297/336)
	Patient generated health data or data from non-clinical setting incorporated into certified electronic health record (EHR)	>5% patients	88% (298/336)
Health Information Exchange (must meet 2 of 3 measures)	Electronically transmit summary of care record to receiving provider	>50% transfers/referrals (minimum 100 cases)	All excluded
	Incorporate electronic summary of care into EHR	>40% transfers/referrals/new patients	100% (223/223)
	Clinical information reconciliation (medications, medication allergies, problem list)	>80% transfers/referrals/new patients	44% (100/227)
Public Health and Clinical Data Registry Reporting	Active engagement in registry reporting, including Immunization registry (bidirectional), Syndromic surveillance, Electronic case reports, Public Health registry, or Clinical data registry	2 registries	100% (336/336)

*Preliminary results based on 10/1/2019—12/31/2019.

■ PI Activity

- ◇ Close encounter validation point created to remind clinicians to reconcile data.
- ◇ Communication to the medical staff from the Chief Quality Officer and Chief Medical Information Officer about the importance of clinical information reconciliation and tip sheets on how to complete the process.
- ◇ List of providers failing measures reported monthly at Pay for Performance Committee. Chief Quality Officer and Chief Medical Information Officer contacted these providers to promote improvement.
- ◇ Enterprise-wide effort to encourage patients to sign up for MyChart and access their information.

■ Future Impact

- ◇ DHHA will continue to submit data for a provider until the provider has successfully participated in this program six times, or December 31, 2021 when the program ends.

1.5. CMS Promoting Interoperability (PI) Programs Medicaid Eligible Provider EHR Incentive Program

Figure 1.5-4: Medicaid Eligible Provider EHR Incentive Program Clinical Quality Measures for Quarter 4 2019 Encounters

Domain	CMS ID	Measure Name	Numerator	Denominator	Compliance	
Efficiency and Cost Reduction	146	Appropriate Testing for Children with Pharyngitis	416	449	93%	
	154	Appropriate Treatment for Children with Upper Respiratory Infection	1795	1926	93%	
Patient Safety	68	Documentation of Current Medications in the Medical Record	34,488	41,747	83%	
	132	Complications within 30 Days Following Cataract Surgery Requiring Additional Surgical Procedures	4	200	2%	
	156	Use of High-Risk Medications in the Elderly: One Medication	1841	6631	28%	
		Use of High-Risk Medications in the Elderly: Two Medications	613	6631	9%	
Community and Population Health	138	Tobacco Use: Tobacco Screening	29,202	29,462	99%	
		Tobacco Use: Cessation Intervention for Tobacco Users	3009	5789	52%	
		Tobacco Use: Tobacco Screening and Cessation Intervention for Tobacco Users	26,422	29,462	90%	
	147	Influenza Immunization	27,890	44,741	62%	
	153	Chlamydia Screening: Women 16-20 years of age	1796	2343	77%	
		Chlamydia Screening: Women 21-24 years of age	2162	2883	75%	
	155	Weight Assessment & Counseling: Age 3-11 years old—BMI Percentile, Height, & Weight	9132	9845	93%	
		Weight Assessment & Counseling: Age 3-11 years old—Counseling for Nutrition	7684	9845	78%	
		Weight Assessment & Counseling: Age 3-11 years old—Counseling for Physical Activity	6970	9845	71%	
		Weight Assessment & Counseling: Age 12-17 years old—BMI Percentile, Height, & Weight	7928	8480	93%	
Weight Assessment & Counseling: Age 12-17 years old—Counseling for Nutrition		6150	8480	73%		
		Weight Assessment & Counseling: Age 12-17 years old—Counseling for Physical Activity	5882	8480	69%	
Effective Clinical Care	74	Primary Caries Prevention Intervention: 0-5 years old	6447	12,493	52%	
		Primary Caries Prevention Intervention: 6-12 years old	2508	9183	27%	
		Primary Caries Prevention Intervention: 13-20 years old	1005	10,752	9%	
	75	Children Who Have Dental Decay or Cavities	3594	32,428	11%	
	122	Diabetes Hemoglobin A1C Poor Control	2350	7822	30%	
	125	Breast Cancer Screening	5563	8921	62%	
	127	Pneumococcal Vaccination Status for Older Adults	5491	6628	83%	
	130	Colorectal Cancer Screening	9457	17,925	53%	
	134	Diabetes: Medical Attention for Nephropathy	7119	7822	91%	
	137	Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 13-17, initiated treatment	10	122	8%	
		Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 13-17, multiple services	5	122	4%	
		Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 18 & older, initiated treatment	55	3092	2%	
			Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 18 & older, multiple services	12	3092	0.4%
	144	Heart Failure: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction	28	28	100%	
	165	Controlling High Blood Pressure	6910	11,673	59%	

■ PI Activity

- ◇ See Section 5 (Outpatient Safety and Quality Initiatives) for detailed information

■ Future Impact

- ◇ CY 2020: CMS is retiring two eQMs which DHHA previously reported (CMS 127 Pneumococcal Vaccination, CMS 147 Influenza Immunization). CMS is adding an eQM on International Prostate Symptom Score or AUA-SI change 6-12 months after diagnosis of benign prostatic hyperplasia.

1.6. CMS/The Joint Commission Clinical Quality Measures CMS Inpatient Quality Reporting (IQR) Program

The Hospital Inpatient Quality Reporting (IQR) Program provides consumers with quality of care information so they can make informed decisions about healthcare options. The program offers financial incentives to hospitals to report the quality of their services. Hospitals that fail to report will face a 2 percentage point reduction in the annual market basket update. DHHA has successfully participated in the IQR Program since its inception.

The FFY 2021 payment determination is based on the CY 2019 reporting period. There were 26 required measures (3 chart-abstracted, 12 claims-based, 6 NHSN, 1 patient experience survey, 4 electronic). CMS mandated hospitals report at least four of the 15 electronic clinical quality measures (eCQMs) that align with the Medicare Promoting Interoperability Program. As shown in Figure 1.6-1, DHHA submitted cases from Q2 2019 for eED-1, eED-2, eEHDI-1, eSTK-6, eVTE-1, and eVTE-2.

CMS conducts validation studies of chart-abstracted process measure sets and Healthcare-Associated Infection (HAI) measures. Hospitals can be randomly selected or specifically targeted based on failing last year's validation study. If a hospital fails validation (<75% agreement), it loses the annual market basket update. DHHA was not randomly selected for the FFY 2021 IQR Inpatient Data Validation program.

Future Impact

- ◇ CY 2020: CMS is removing 14 measures (ED-2, eAMI-8a, eCAC-3, eED-1, eEHDI-1a, ePC-01, eSTK-8, eSTK-10, CAUTI, CDI, CLABSI, SSI, MRSA, MORT-30-CABG).
- ◇ CY 2021: CMS is removing one measure (COMP-HIP-KNEE) and adding one measure (Safe Use of Opioids—Concurrent Prescribing).

The Joint Commission ORYX Initiative

The Joint Commission's (TJC) ORYX initiative integrates outcomes and other performance measures into the accreditation process. In 2019, DHHA was required to submit seven chart-abstracted measures and at least four of 13 available eCQMs. Two of the chart-abstracted measures aligned with the CMS IQR program (ED-2, PC-01). However, TJC required four additional perinatal care measures (PC-02, PC-03, PC-04, and PC-06). Chart-abstracted measures are reported for the entire year whereas the eCQM measures are reported for a self-selected quarter in 2019. DHHA submitted the same six eCQMs to TJC and CMS (Figure 1.6-1). Hospitals that fail to participate will lose their accreditation.

Future Impact

- ◇ CY 2020: TJC is removing six measures (PC-03, PC-04, eAMI-8a, eCAC-3, eED-1, eEHDI-1a) and adding one electronic clinical quality measure regarding cesarean section (ePC-02).

Figure 1.6-1: Electronic Clinical Quality Measures

Measure ID	Electronic Clinical Quality Measure	Program Year 2019*
eED-1	Median Time from ED Arrival to ED Departure for Admitted Patients	283 minutes (N=2637)
	Strata 1: Medical patients	504 minutes (N=139)
eED-2	Median Time from Admit Decision to ED Departure for Admitted Patients	61 minutes (N=2620)
	Strata 2: Psychiatric patients	76 minutes (N=139)
eEHDI-1a	Hearing Screening Prior to Hospital Discharge	98.4% (833/847)
eSTK-6	Stroke Patients Discharged on Statin Medication	100% (20/20)
eVTE-1	Venous Thromboembolism Prophylaxis for Non-Intensive Care Unit Patients	91.6% (1317/1438)
eVTE-2	Venous Thromboembolism Prophylaxis for Intensive Care Units Patients	99.0% (711/718)

* Reporting period is Quarter 2 2019

1.6. CMS/The Joint Commission Clinical Quality Measures Hospital Inpatient

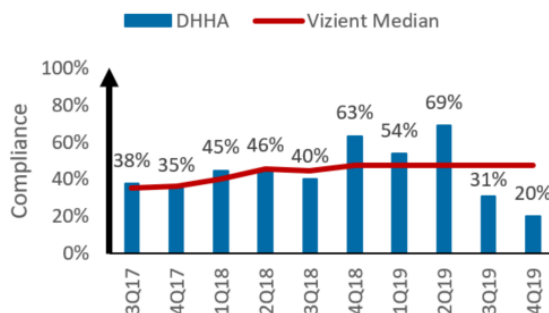
Severe Sepsis and Septic Shock (SEP)

Severe Sepsis and Septic Shock Management Bundle (SEP-1) was a mandatory chart-abstracted measure in 2019 for the CMS IQR program and publicly reported on Hospital Compare.

2019 Results

- 44% of patients passed all applicable measure components in the Sepsis Composite (compared 48.7% in 2018).

**Figure 1.6-2: Early Management Bundle:
Severe Sepsis / Septic Shock (SEP-1)**



Analysis

- The decrease in compliance in 3Q19 and 4Q19 may be related to cases failing one component of the bundle sepsis. In addition, the data indicate that compliance was high if the patient was in shock, but lower compliance in meeting the bundle requirements related to those patients with questionable severe sepsis.

Figure 1.6-3: Denver Health Compliance with Early Management Bundle: Severe Sepsis / Septic Shock (SEP-1)

BUNDLE	MEASURE	TARGET GOAL	STRETCH GOAL	2019 DHHA COMPLIANCE
3 HOUR BUNDLE	Initial lactate drawn between 6 hours prior through 3 hours after meeting severe sepsis criteria	85%	95%	96%
	Blood cultures drawn between 48 hours prior through 3 hours after meeting severe sepsis criteria	70%	80%	90%
	Antibiotics administered between 24 hours prior through 3 hours after meeting severe sepsis criteria	70%	80%	86%
	Fluid resuscitation (30 cc/kg) administered within 3 hours of initial hypotension or septic shock presentation	65%	75%	61%
6 HOUR BUNDLE	Re-measure lactate (if initial lactate >2.0) within 6 hours of meeting severe sepsis criteria	65%	75%	63%
	Vasopressors given within 6 hours of septic shock presentation if persistent hypotension after fluid bolus	60%	70%	89%
	Physical reassessment after fluid resuscitation started and within 6 hours of septic shock presentation	35%	45%	81%
OVERALL	Below Target Target to Stretch Above Stretch	35%	45%	44%

- **PI Activity**

- ◇ Updated Nursing BPA in Emergency Department (ED) based on Fever and Tachycardia in the ED
- ◇ Sepsis Order Sets revised for clarity
- ◇ Real time screens of Septic Shock cases in the ED are sent to ED Leadership on a weekly basis
- ◇ ED Leadership provided quarterly reports on provider-level compliance for Septic Shock
- ◇ Annual physician level data reported to ED leadership for Ongoing Professional Performance Evaluation (OPPE) process
- ◇ Monthly and continuous education provided to MICU residents and interns on documentation of the physical reassessment, diagnosis and sepsis alert process
- ◇ Implemented sepsis screening into the revised Rapid Response system
- ◇ Acute Care areas trialed sepsis screening tool

- **Future Impact**

- ◇ CY 2020 CMS IQR: SEP-1 remains a mandatory chart abstracted measure
- ◇ Attending Physicians in the ED are held accountable for the care of patients with Septic Shock via the OPPE process
- ◇ Eventually CMS plans to start penalizing low performing institutions

1.6. CMS/The Joint Commission Clinical Quality Measures Hospital Inpatient

Perinatal Care Conditions (PC)

PC-01 was a mandatory chart-abstracted measure in 2019 for the CMS IQR program.

Perinatal Care measure set (PC-01, PC-02, PC-03, PC-04, PC-05 and PC-06) must be chart-abstracted for the 2019 TJC ORYX program.

2019 Results

- ◇ 0% of pregnant women had an elective delivery between 37 and 39 weeks gestation (PC-01).
- ◇ 20% of nulliparous women with a term baby in a vertex position were delivered by cesarean section (PC-02).
- ◇ 100% of pregnant women at risk of preterm delivery at 24-32 weeks gestation received antenatal steroids prior to delivering the preterm newborn (PC-03).
- ◇ 0% of high risk newborns diagnosed with septicemia or bacteremia acquired their infection in the hospital (PC-04).
- ◇ 59% of full term newborns were exclusively fed breast milk during the inpatient stay following birth (PC-05).
- ◇ 3.3% of full term newborns with no pre-existing conditions had unexpected complications (PC-06).

Figure 1.6-4: Elective Delivery (PC-01)

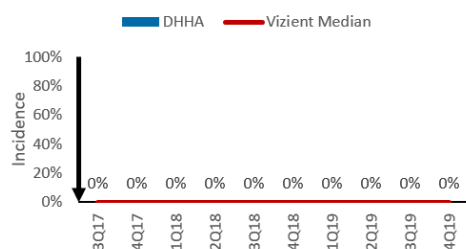


Figure 1.6-5: Cesarean Section (PC-02)

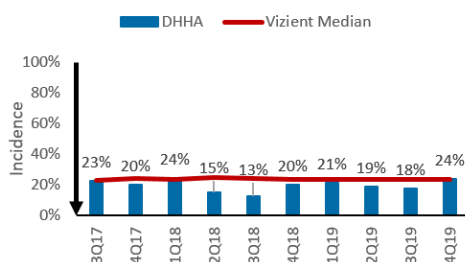


Figure 1.6-6: Antenatal Steroids (PC-03)

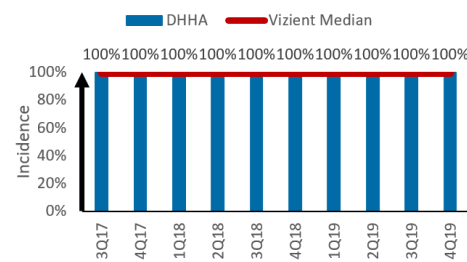


Figure 1.6-7: Healthcare Associated Blood Stream Infections in Newborns (PC-04)

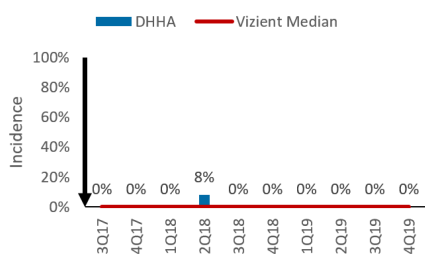


Figure 1.6-8: Exclusive Breast Milk Feeding Overall (PC-05)

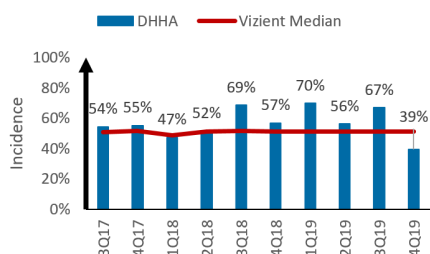
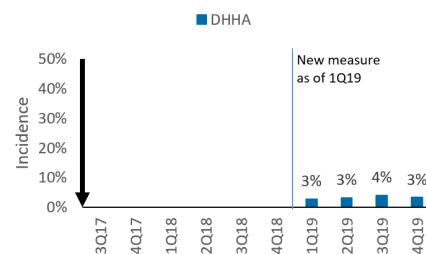


Figure 1.6-9: Unexpected Complications in Term Newborns—Overall (PC-06)



PI Activity

- ◇ Exclusive breast milk feeding results are provided to the Breast Feeding Council monthly.
- ◇ DPSQ and CDI staff reviewed failed PC-06 cases to identify possible coding errors with a reversal rate of 30%.

Future Impact

- ◇ CY 2020: CMS is removing the electronic clinical quality measure on elective delivery (ePC-01).

1.6. CMS/The Joint Commission Clinical Quality Measures CMS Hospital Outpatient Quality Reporting (OQR) Program

The Outpatient Prospective Payment System (OPPS) pays for services furnished to Medicare beneficiaries in hospital outpatient departments and ambulatory surgery centers. Hospitals that fail to meet the outpatient quality reporting (OQR) requirements receive a 2 percentage point reduction in payments. For the CY 2021 payment determination (i.e. program year 2019), there were 14 measures (4 chart-abstracted, 4 web-based, 6 claims-based).

DHHA was not randomly selected by CMS for Outpatient Data Validation for the CY 2021 annual payment update determination. Hospitals that fail validation (<75% agreement) will lose the annual market basket update.

Chart Abstracted Measures

These measures are based on care in the Emergency Department so they will be described along with the inpatient CQMs in the Emergency Department CQM section of this report.

Claims-Based Measures

These measures are based on Medicare FFS claims. They are all reverse measures, i.e. lower scores indicate better performance. Denver Health providers ordered contrast for abdominal Computed Tomography (CT) scans over two times less often than the national average but ordered Magnetic Resonance Imaging (MRI) scans for low back pain 7% more frequently (Figure 1.6-9).

Figure 1.6-10: CMS Hospital Outpatient Quality Reporting Program: Claims-Based Measures

ID	Measure	DHHA	National	Encounters
OP-8	Magnetic Resonance Imaging (MRI) Scan of Lumbar Spine for Low Back Pain	45.8%	38.7%	7/1/17-6/30/18
OP-10	Abdomen Computed Tomography (CT) — Use of Contrast Material	2.0%	6.9%	7/1/17-6/30/18
OP-13	Cardiac Imaging for preoperative risk assessment for non-cardiac low-risk surgery	0%	4.7%	7/1/17-6/30/18
OP-32	Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy per 1,000 colonoscopies	16.7	16.4	1/1/16-12/31/18
OP-35	Admissions and ED Visits for Patients Receiving Outpatient Chemotherapy	18.6	18.5	1/1/18-12/31/18
OP-36	Hospital Visits After Hospital Outpatient Surgery	0.98	n/a	1/1/18-12/31/18

Web-Based Measures

These measures are submitted annually. DHHA had zero cases for External Beam Radiotherapy for Bone Metastases (OP-33). ED Patient Left Without Being Seen (OP-22) is reported in the ED CQM section. DHHA did not submit the voluntary measure: Improvement in Patient's Visual Function within 90 Days After Cataract Surgery (OP-31). CMS does not provide benchmarks for these measures. DHHA has perfect compliance in 2019 for the appropriate follow-up interval for normal colonoscopies (Figure 1.6-10).

Figure 1.6-11: CMS Hospital Outpatient Quality Reporting Program: Web-Based Measures

ID	Measure	DHHA			
		2016	2017	2018	2019
OP-29	Appropriate Follow-up Interval for Normal Colonoscopy in Average Risk Patients	97%	100%	98%	100%

Future Impact

- ◇ CY 2020:
 - CMS is retiring External Beam Radiotherapy for Bone Metastases (OP-33)

1.6. CMS/The Joint Commission Clinical Quality Measures Emergency Department

CMS does not have a separate payment system or quality reporting program for Emergency Department (ED) encounters. Instead, these visits are incorporated into either the Inpatient Quality Reporting or Outpatient Quality Reporting programs depending on a patient's final discharge disposition. Patients who are discharged home from the ED are considered outpatients whereas patients who are admitted are considered inpatients. The Joint Commission only monitors the inpatient ED measures.

CMS retired chart abstracted measure ED-1. ED-2 remained a mandatory chart-abstracted measure in 2019 for the CMS IQR and TJC ORYX programs. eED-1 and eED-2 were selected as electronic quality measures for TJC ORYX program. ED-OP-18b and ED-OP-23 were mandatory chart abstracted measures for the CMS OQR program.

2019 Results

- ◇ 287 minutes was the median time from ED arrival to ED departure for patients admitted to the hospital (ED-1b)
- ◇ 99 minutes was the median time from admit decision to ED departure for patients admitted to the hospital (ED-2b)
- ◇ 220 minutes was the median time from ED arrival to ED departure for patients discharged from the ED (OP-18b)
- ◇ 50% of stroke patients had a head CT or MRI scan interpreted within 45 minutes of ED arrival (OP-23)

Figure 1.6-12: Time from ED arrival to departure for admitted patients (ED-1b)

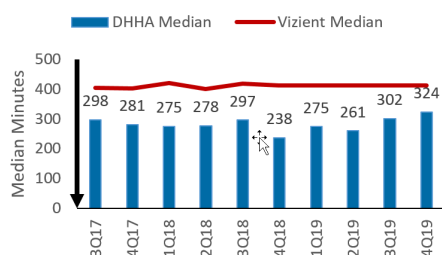


Figure 1.6-13: Time from admit decision to ED departure for admitted patients (ED-2b)

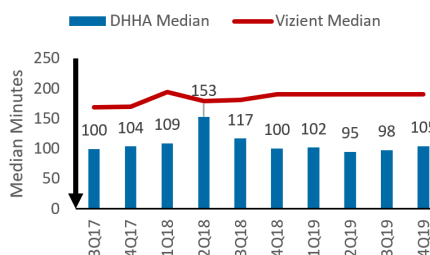


Figure 1.6-14: Time from ED arrival to departure for discharged patients (OP-18b)

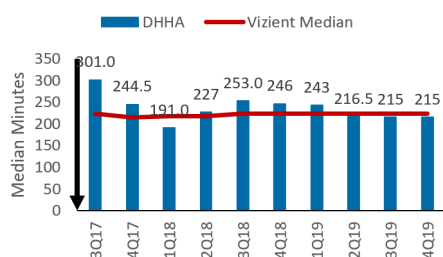
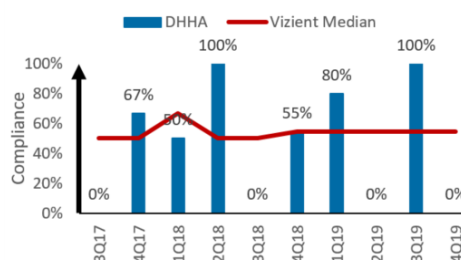


Figure 1.6-15: Stroke MRI Interpretation within 45 minutes (OP-23)



PI Activity

- ◇ Throughout the year extensive work conducted with the ED Epic team to ensure consistent times are captured during abstraction. This will allow for consistency between core measure data and ED throughput data. Additionally, it is a better reflection of the patients' ED experience as it relates to time.
- ◇ Educated staff to the documentation needs related to the ED Depart Time.
- ◇ Created a Core Measure Quality Summary report to ease abstraction.
- ◇ Worked with the HIM department to ensure abstraction documentation components are in the legal medical record.

Future Impact

- ◇ CY 2020: CMS is retiring the chart-abstracted measures ED-2 and OP-21, as well as electronic measures eED-1 and eED-3 (which is the same as eOP-18b). TJC is retiring eED-1.

1.6. CMS/The Joint Commission Clinical Quality Measures CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

The Inpatient Psychiatric Facility Quality Reporting (IPFQR) program’s goals are to help consumers make more informed decisions about healthcare options and to encourage hospitals to improve the quality of care. Inpatient Psychiatric Facilities (IPFs) collect aggregate data by quarter and submit to CMS annually. IPFs that do not participate or meet reporting requirements receive a 2.0 percentage point reduction of their annual payment update. The reduction is non-cumulative across payment years. There are 11 measures and 4 sub-measures for the FFY 2019 payment determination.

Future Impact

- ◇ FY 2021: CMS is adding a new measure—Medication Continuation Following Inpatient Psychiatric Discharge

Alcohol Use (IPF-SUB)

2019 Results

- ◇ 88.8% of psychiatric inpatients who screened positive for unhealthy alcohol use, alcohol abuse, or alcohol dependence were offered a brief intervention during the hospital stay (IPF-SUB-2).
- ◇ 87.6% of psychiatric inpatients who screened positive for unhealthy alcohol use, alcohol abuse, or alcohol dependence received a brief intervention during the hospital stay (IPF-SUB-2a).
- ◇ 76.5% of psychiatric inpatients who screened positive for unhealthy alcohol use or other drug use disorder were offered treatment at discharge (IPF-SUB-3).
- ◇ 62.4% of psychiatric inpatients who screened positive for unhealthy alcohol use or other drug use disorder received treatment at discharge (IPF-SUB-3a).

Figure 1.6-16: Brief Intervention Offered in Hospital Stay (IPF-SUB-2)

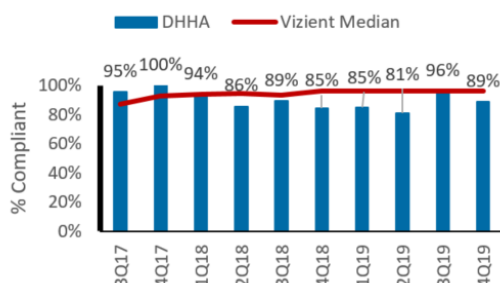


Figure 1.6-17: Brief Intervention Received in Hospital Stay (IPF-SUB-2a)

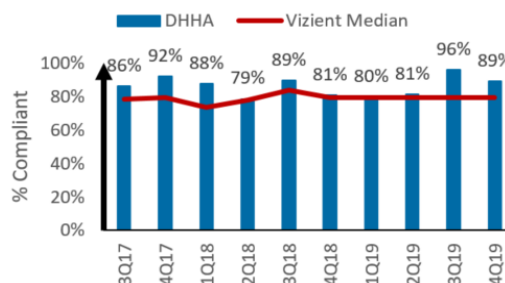


Figure 1.6-18: Alcohol and other Drug Use Disorder Treatment Offered at Discharge (IPF-SUB-3)

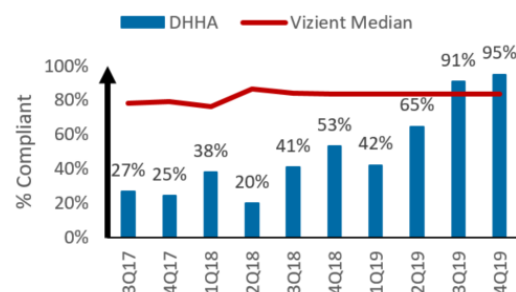
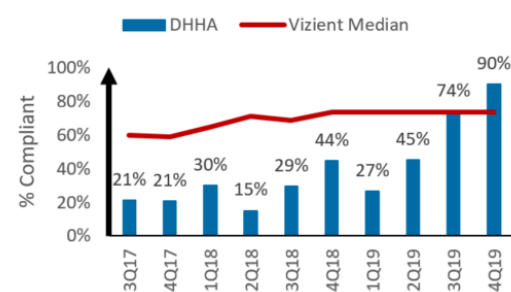


Figure 1.6-19: Alcohol and Other Drug Use Disorder Treatment Provided at Discharge (IPF-SUB-3a)



PI Activity

- ◇ DPSQ worked with the Behavioral Health division to drastically improve IPF-SUB-3 from 39% in 2018 to 77% in 2019 and IPF-SUB-3a from 30% in 2018 to 62% in 2019.
- ◇ To continue to make improvements as well as to maintain gains, failures are shared with staff in a timely manner, aggregate data is shared regularly, and quarterly quality meetings provide oversight.

1.6. CMS/The Joint Commission Clinical Quality Measures CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

Tobacco Use (IPF-TOB)

■ 2019 Results

- ◇ 97.8% of psychiatric inpatients who used tobacco within the past 30 days were offered cessation counseling and tobacco cessation medication during the hospital stay (IPF-TOB-2).
- ◇ 31.7% of psychiatric inpatients who used tobacco within the past 30 days received cessation counseling and tobacco cessation medication during the hospital stay (IPF-TOB-2a).
- ◇ 57.9% of psychiatric inpatients who used tobacco within the past 30 days were offered an outpatient counseling referral and tobacco cessation medication at discharge (IPF-TOB-3).
- ◇ 39.2% of psychiatric inpatients who used tobacco within the past 30 days received an outpatient counseling referral and tobacco cessation medication at discharge (IPF-TOB-3a).

Figure 1.6-20: Tobacco Use Treatment Offered in Hospital Stay (IPF-TOB-2)

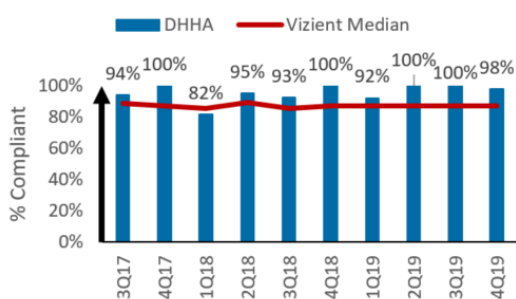


Figure 1.6-21: Tobacco Use Treatment Received in Hospital Stay (IPF-TOB-2a)

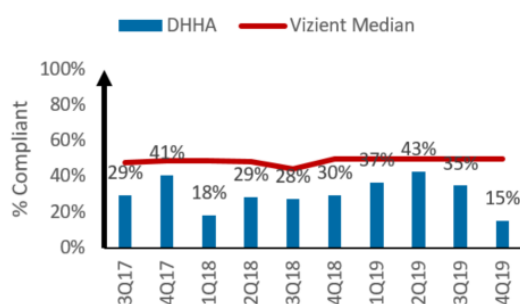


Figure 1.6-22: Tobacco Use Treatment Offered at Discharge (IPF-TOB-3)

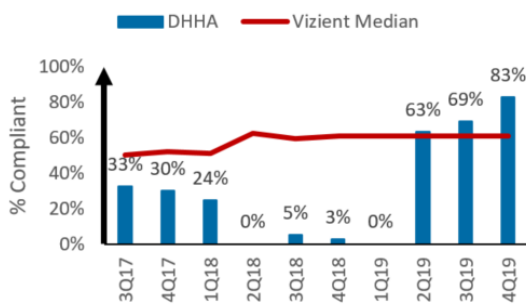
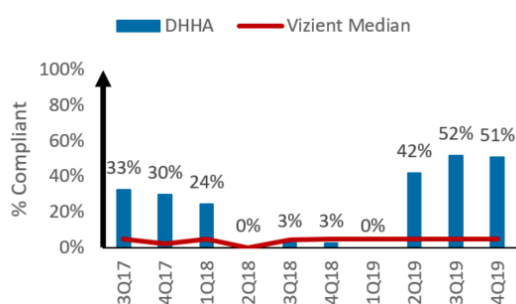


Figure 1.6-23: Tobacco Use Treatment Provided at Discharge (IPF-TOB-3a)



■ PI Activity

- ◇ DPSQ worked with the Behavioral Health division to drastically improve IPF-TOB-3 from 9% in 2018 to 58% in 2019 and IPF-TOB-3a from 8% in 2018 to 39% in 2019. As seen in Figures 1.6-21 and 1.6-22, Behavioral Health staff rarely had documentation of tobacco use treatment at discharge from Q2 2018 through Q1 2019. This was due to the Quit Line tobacco cessation program being removed from the inpatient After Visit Summary (AVS). The Quit Line information was added back to the AVS during the Epic upgrade in March 2019, and DHHA's performance improved dramatically.
- ◇ To continue to make improvements as well as to maintain gains, failures are shared with staff in a timely manner, aggregate data is shared regularly, and quarterly quality meetings provide oversight.

1.6. CMS/The Joint Commission Clinical Quality Measures CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

Hospital-Based Inpatient Psychiatric Services (HBIPS)

2019 Results

- ◇ 0.61 hours of physical restraint usage per 1,000 patient hours (HBIPS-2).
- ◇ 0.43 hours of seclusion used per 1,000 patient hours (HBIPS-3).
- ◇ 78.6% of discharges on multiple antipsychotics were justified (HBIPS-5a).

Figure 1.6-24: Physical restraint rate (HBIPS-2)

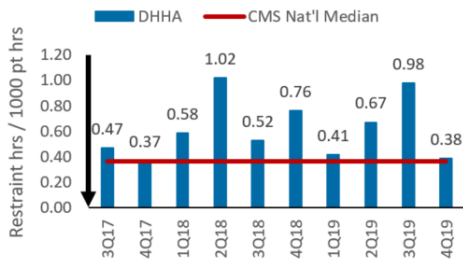


Figure 1.6-25: Seclusion rate (HBIPS-3)

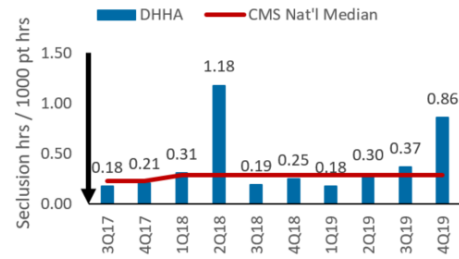
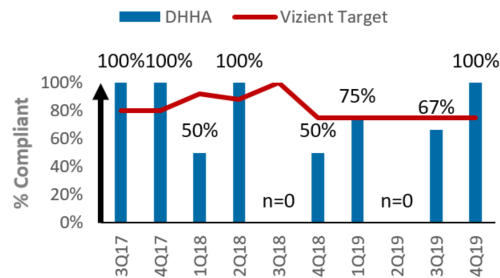


Figure 1.6-26: Discharged with Multiple Antipsychotics Justified (HBIPS-5a)



PI Activity

- ◇ DPSQ and Epic Inpatient Clinical Documentation teams collaborated to create a drop-down list with allowable justifications for multiple antipsychotic medications in the provider discharge summary.
- ◇ Process for real time feedback to providers was developed for learning and ongoing improvement.

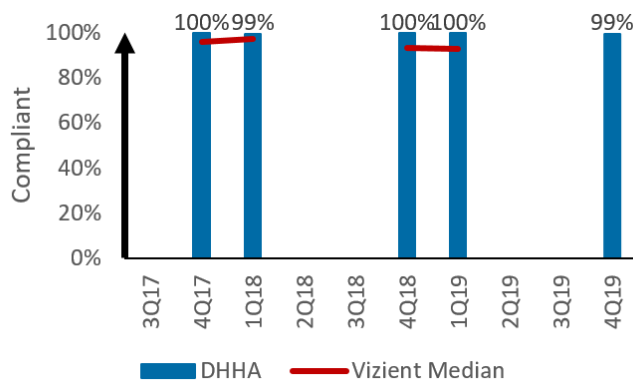
1.6. CMS/The Joint Commission Clinical Quality Measures CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

Influenza Immunization (IPF-IMM-2)

2019 Results

- ◇ During the 2018-2019 flu season, 100% of psychiatric inpatients received their influenza immunization (IPF-IMM-2).
- ◇ During the first half of the 2019-2020 flu season, 99.4% of patients received their influenza immunization (IPF-IMM-2).

Figure 1.6-27: Influenza Immunization (IPF-IMM-2)



PI Activity

- ◇ DPSQ staff reviewed all discharges within the previous 24 hours for missed documentation on vaccine status. The discharging unit nurse manager and clinical nurse educator were apprised of the missed opportunity. Feedback was provided for unit staff education. If appropriate, retrospective documentation was facilitated.

1.6. CMS/The Joint Commission Clinical Quality Measures CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

Transitions of Care (IPF-TTR) and Screening for Metabolic Disorders (IPF-SMD)

2019 Results

- ◇ 89% of psychiatric inpatients received a transition record with the 11 mandatory elements (IPF-TTR-1).
- ◇ 88% of psychiatric inpatients received their transition record within 24 hours of discharge (IPF-TTR-2).
- ◇ 68% of patients discharged with at least one routinely scheduled antipsychotic medication received a metabolic screening in the 12 months prior to the discharge or during the inpatient psychiatric stay (IPF-SMD-1).

Figure 1.6-28: Transition Record with Specified Elements Received by Discharged Patients (IPF-TTR-1)

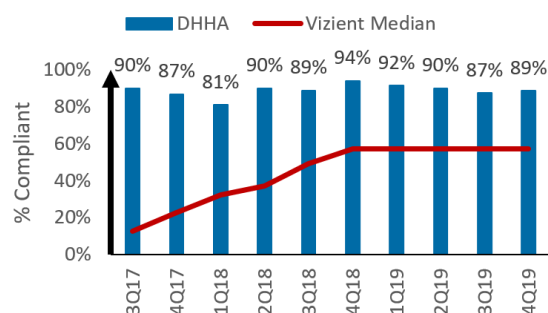


Figure 1.6-29: Timely Transmission of Transition Record (IPF-TTR-2)

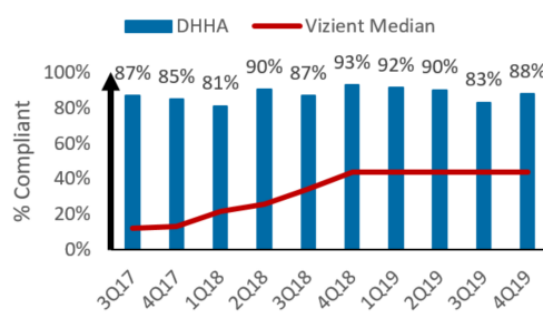
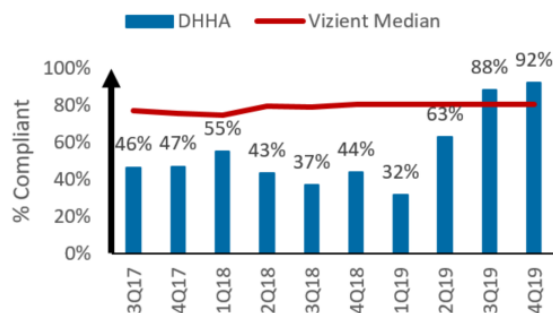


Figure 1.6-30: Screening for Metabolic Disorders (IPF-SMD-1)



Claims-Based Measures

Higher rates for Follow-up After Hospitalization (FUH) indicates better performance whereas lower rates for Unplanned Readmission indicates better performance. The FFY 2019 IPFQR claims-based measures on follow-up care includes Medicare FFS paid claims for encounters from July 1, 2017 to June 30, 2018 while the readmission measure is based on index discharges from July 1, 2016 to June 30, 2018.

Figure 1.6-31: CMS Inpatient Psychiatric Facility Quality Reporting Program: Claims-Based Measures

Measure ID	Measure	DHHA	National Median (In terquartile Range)	DHHA Performance Percentile
FUH-30	Follow-Up After Hospitalization for Mental Illness 30-Days	54.8%	50.0% (40.6% - 60.0%)	64 th
FUH-7	Follow-Up After Hospitalization for Mental Illness 7-Days	21.9%	25.8% (18.4% - 35.3%)	36 th
READM-30-IPF	30-Day All-Cause Unplanned Readmission Following Hospitalization in an Inpatient Psychiatric Facility	17.1%	20.0% (18.3% - 21.9%)	12 th

1.7. CMS Overall Hospital Quality Star Rating

CMS developed the Star Ratings in response to consumer and patient feedback that information displayed on *Hospital Compare* was difficult to understand. The existing quality measurements were simplified into a 5-star rating system. CMS has been unable to maintain quarterly releases due to methodology concerns. Quality ratings were publicly released in December 2017, January 2019, and January 2020. CMS plans to release a proposed rule in 2020 changing the methodology with hopes of finalizing it before new star ratings are issued in 2021.

DHHA achieved a 3-Star rating in the 2019 and 2020 release. (Figure 1.7-1). This improvement can be attributed to focused efforts on reducing hospital-acquired infections and AHRQ patient safety indicators (Figure 1.7-2).

Figure 1.7-1: CMS Overall Hospital Star Rating

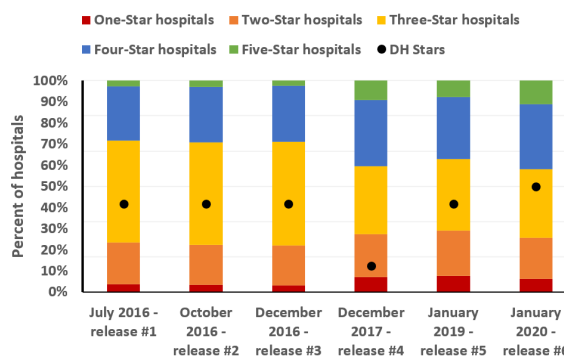
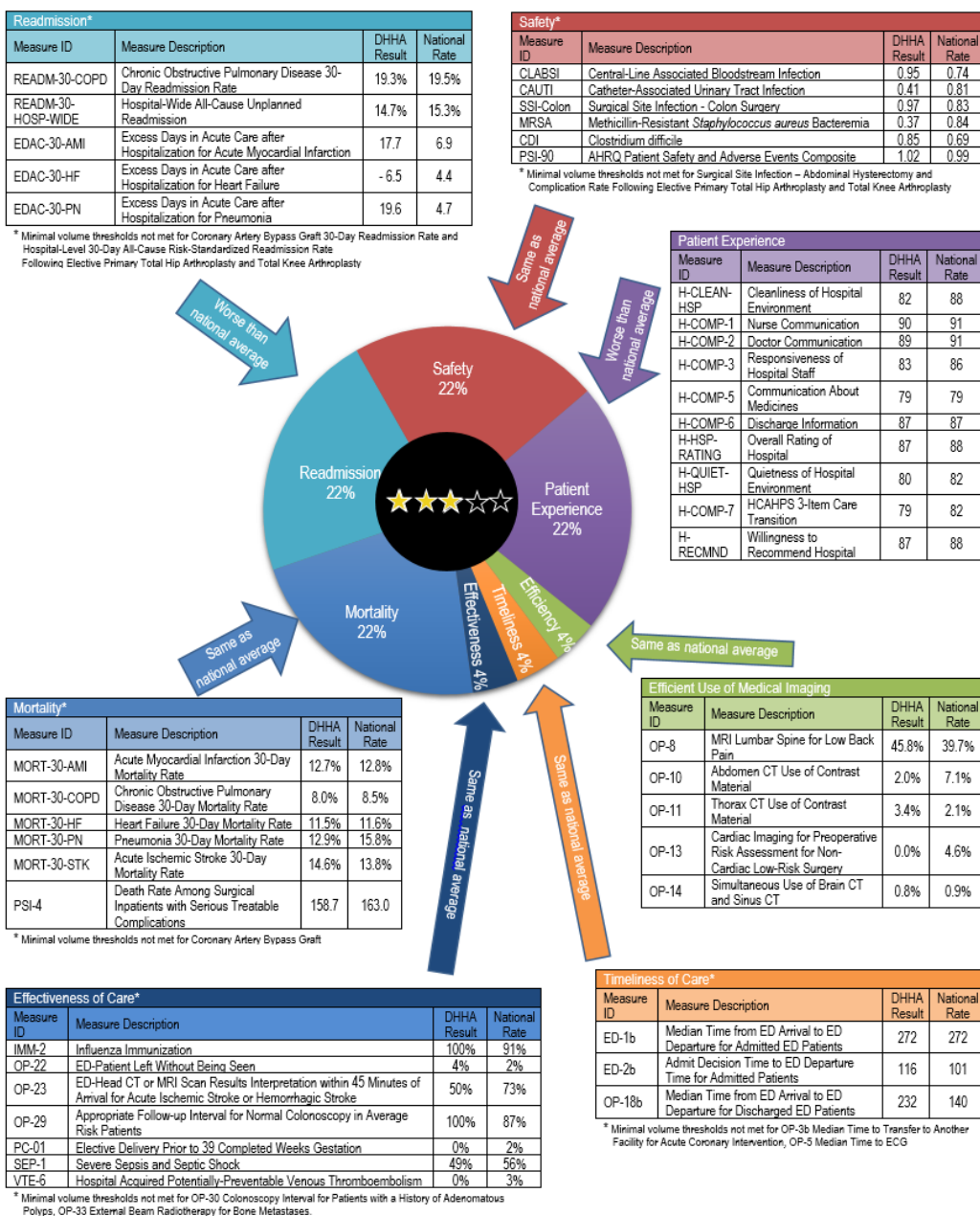


Figure 1.7-2: Overall Hospital Star Rating for Denver Health—January 2020



1.8. Hospital Quality Incentive Program (HQIP)

The Colorado Department of Health Care Policy and Financing (HCPF) started HQIP in 2011 to incentivize hospitals to improve health care and patient outcomes. The state's Medicaid agency retains a percentage of each hospital's payment and distributes incentive payments based on each hospital's performance on selected nationally recognized measures. In 2019, HCPF added measures on perinatal depression and anxiety, maternal emergencies, family planning, patient experience surveys, alternatives to opioids, substance use screening, and Prometheus hospital index.

DHHA received full points on the Regional Accountable Entity Engagement, Substance Use, and Addressing Cost of Care domains. DHHA's patient experience scores were in the worst quartile. However, falls with injury and advance care planning were in the best quartile. DHHA received a final score of 82 of 100 points which translated into an estimated payment of \$8,000,000. (Figure 1.8-1). Over the prior five years, DHHA received over \$37.5 million in incentive payments from this program (Figure 1.8-2).

- **Next Steps:**
 - ◇ Enterprise-wide initiatives to improve patient experience
- **Future Impact of 2020 Program**
 - ◇ Five new measures added: Incidence of Episiotomy, Peripartum Racial and Ethnic Disparities, Sepsis, Antibiotics Stewardship, Handoffs and Signouts
 - ◇ Four measures removed: Falls with injury (retired); RAE Engagement, Substance Use, and Addressing Cost of Care (transferred to HCPF Hospital Transformation Program)

Figure 1.8-1: HQIP Program Year 2019

Measure Group	Measure Name	Rate/Result	Points
Maternal Health and Perinatal Care	Breastfeeding Practices <ul style="list-style-type: none"> • Exclusive Breast Milk Feeding (PC-05) • Baby-Friendly Designation, 4-D Pathway, or Breastfeeding Policy 	56% Policy	1 of 1 1 of 3
	Cesarean Section rate (PC-02)	18.5%	2 of 4
	Perinatal Depression and Anxiety—readiness, recognition and prevention, response, reporting/systems learning	Yes	4 of 4
	Maternal Emergencies and Preparedness—policy, electronic process, resources, formal debriefs	Yes	4 of 4
	Reproductive Life/Family Planning	Counseling offered	4 of 4
Patient Safety	Hospital Acquired <i>Clostridioides difficile</i> Standardized Infection Ratio (SIR)	Same as national average	3 of 5
	Adverse Event Reporting	Yes	5 of 5
	Falls with Injury per 1,000 Patient Days	0.014	5 of 5
	Culture of Safety Survey	Yes	5 of 5
Patient Experience	Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) <ul style="list-style-type: none"> • Communication and Medications • Discharge Information • Care Transition 	64% 87% 46%	0 of 12
	Advance Care Planning for patients 65 years or older	100%	3 of 3
Regional Accountable Entity (RAE) and Behavioral Health Organization (BHO) Engagement	<ul style="list-style-type: none"> • Notify RAE within 24 hours of ED visits • Notify RAE of inpatient admission • Collaborate with RAE/BHO to address substance use disorder • Physical Health Collaboration: a) Population health, b) Care coordination, c) Case management, d) High utilizers, e) RAE Advisory board participant • Mental Health Collaboration: a) High utilizers, b) Case management, c) Staff training, d) Policy notifying BHO of ED patient suicide attempt/ideation, e) Policy for follow-up with BHO/patient within 24 hours of suicide attempt, f) BHO Advisory board participant 	Yes, except Mental Health Collaboration (d) and (f)	20 of 20
Substance Use	Alternatives to Opioids (ALTOs) in the Emergency Department	Yes	2 of 2
	Tobacco and Substance Use Screening	89.1%	8 of 8
Addressing Cost of Care	Prometheus Hospital Index	Reviewed	15 of 15

Figure 1.8-2: HQIP Incentive Payments to Denver Health by Program Year

	2014	2015	2016	2017	2018	2019
Points	21 of 46	30 of 50	27 of 50	30 of 40	64 of 80	82 of 100
Incentive Payment	\$3,402,655	\$5,857,931	\$4,612,904	\$7,933,197	\$7,551,062	\$8,200,000*

*estimated

1.9. The Leapfrog Group Hospital Safety Grade

The Leapfrog Hospital Safety Grade is a single letter grade which represents a hospital's overall performance in keeping patients safe from preventable harm and medical errors. The score uses 28 performance measures from CMS, the Leapfrog Hospital Survey, AHRQ, CDC, and the American Hospital Association's Annual Survey and Health Information Technology Supplement. The Safety Grade is assigned to over 2,600 hospitals nationwide twice annually. Safety scores are accessible to the public via <http://www.hospitalsafetygrade.org>. Denver Health received a letter grade of A for the second time in the Spring of 2019. DHHA's decline to a letter grade of B in the Fall of 2019 reflects a single adverse event that occurred in 2018 (Figure 1.9-1). Results for individual measures are shown in Figure 1.9-2.

Figure 1.9-1: Denver Health Hospital Safety Grades

Spring 2014	Fall 2014	Spring 2015	Fall 2015	Spring 2016	Fall 2016	Spring 2017	Fall 2017	Spring 2018	Fall 2018	Spring 2019	Fall 2019
B	B	B	C	C	C	C	C	C	A	A	B

Figure 1.9-2: Denver Health Performance on Leapfrog Hospital Safety Grade Measures

Outcome Measures	DHHA Spring 2019	DHHA Fall 2019	Process Measures	DHHA Spring 2019	DHHA Fall 2019
Foreign object retained*	0.00	0.36	Doctors order medications through a comput-	100	100
Air embolism*	0.00	0.00	Safe medication administration†	100	100
Patient falls and trauma*	0.41	0.37	Specially trained doctors care for ICU pa-	100	100
Central line associated blood stream infection**	1.07	0.97	Effective leadership to prevent errors †	120	120
Catheter associated urinary tract infection**	0.72	0.42	Staff work together to prevent errors †	110.8	110.8
Surgical site infection after colon surgery**	0.90	0.97	Track and reduce risks to patients †	100	96.7
Methicillin resistant <i>Staph aureus</i> infection**	0.13	0.37	Enough qualified nurses †	100	100
<i>C. difficile</i> infection**	0.94	0.85	Hand hygiene †	60	60
PSI 3: Pressure ulcers*	0.13	0.16	HCAHPS: Communication with nurses ‡	89	90
PSI 4: Death from treatable serious complications*	154.8	158.7	HCAHPS: Communication with doctors ‡	91	90
PSI 6: Iatrogenic pneumothorax*	0.35	0.29	HCAHPS: Responsiveness of hospital staff ‡	82	83
PSI 11: Postop respiratory failure*	7.56	8.69	HCAHPS: Communication about medicines ‡	79	78
PSI 12: Perioperative PE/DVT*	5.45	6.03	HCAHPS: Communication about discharge‡	88	87
PSI 14: Postop wound dehiscence*	0.78	0.91			
PSI 15: Abdominopelvic accidental puncture or laceration*	1.18	1.13			

Performance Period:
* Spring 10/1/15-6/30/17 & Fall 7/1/16-6/30/18
** Spring 7/17/17-6/30/18 & Fall 1/1/18-12/31/18
† Spring 1/1/2018-12/31/2019 & Fall 1/1/2019-12/31/2019
‡ Spring 4/1/17-3/31/18 & Fall 10/1/17-9/30/18

Below national average

Equal to national average

Above national average

1.10. Colorado Department of Public Health and Environment (CDPHE)

Colorado Department of Public Health and Environment (CDPHE) publishes Healthcare-Associated Infection (HAI) rates annually per legislation for state licensure. These HAIs include infections associated with surgeries, central lines, and hospital acquired *Clostridioides difficile* infections. Data are reported by each institution to the CDC's National Healthcare Safety Network (NHSN). Denver Health's most recent performance on all measures was not statistically different from the national benchmarks (Figure 1.10-1). Improvement efforts are described in the Infection Control section.

Figure 1.10-1: Denver Health Healthcare-Associated Infections

		2016				2017				2018			
		Number of Procedures	Number of Infections	SIR	National Comparison	Number of Procedures	Number of Infections	SIR	National Comparison	Number of Procedures	Number of Infections	SIR	National Comparison
Breast Surgery (Inpatient)		52	3	2.1	Same	42	2	1.9	Same	43	1	0.9	Same
Breast Surgery (Outpatient)		169	2	1.2	Same	158	0	0	Same	155	1	0.5	Same
Colon Surgery		129	13	1.5	Same	137	9	1.0	Same	121	5	0.6	Same
Hip Replacement		109	2	1.2	Same	92	3	2.6	Same	143	2	1.0	Same
Knee Replacement		160	1	1.0	Same	103	1	***	***	156	2	1.8	Same
Abdominal Hysterectomy		74	1	0.5	Same	76	4	1.9	Same	79	1	0.5	Same
	Unit Type	Number of Central Line Days	Number of Infections	SIR	National Comparison	Number of Central Line Days	Number of Infections	SIR	National Comparison	Number of Central Line Days	Number of Infections	SIR	National Comparison
Central Line-Associated Bloodstream Infections	Critical Care	4,594	9	1.5	Same	3,473	6	1.3	Same	3,712	7	1.5	Same
	Neonatal Critical Care	1,043	3	***	***	714	0	***	***	845	1	0.9	Same
	Acute Care Wards	6,630	7	1.1	Same	6,126	4	0.7	Same	5,857	3	0.5	Same
	Inpatient Rehab	110	0	***	***	217	0	***	***	201	0	***	***
		Number of Patient Days	Number of Infections	SIR	National Comparison	Number of Patient Days	Number of Infections	SIR	National Comparison	Number of Patient Days	Number of Infections	SIR	National Comparison
C. difficile Infections		95,481	90	1.2	Same	98,519	64	0.8	Same	102,669	75	0.8	Same

Abbreviation: SIR, Standardized Infection Ratio

*** Data suppressed because predicted number of infections was less than one or facility had fewer than 20 procedures in the year

2. NATIONAL COLLABORATIVES

2.1. Vizient Inpatient Quality and Accountability (Q&A) Scorecard

Vizient created the Quality and Accountability (Q&A) Study in 2005 to help organizations assess their performance across a broad spectrum of high-priority dimensions of patient care. The Q&A Scorecard allows institutions to benchmark their results against similar institutions. In 2019, DHHA received three of five stars overall (Figure 2.1-1). Figure 2.1-2 shows DHHA's performance on each domain while Figure 2.1-3 displays performance on each metric. DHHA was in the best performing decile for Oncology mortality, communication about medications, postoperative sepsis, arthroplasty complications, hypoglycemia after insulin use, lactate drawn for sepsis patients, and direct cost for five service lines. However, DHHA was in the worst performing decile for Cardiothoracic Surgery mortality, Neurology excess days, and 30-day all-cause unplanned readmissions for four service lines.

Figure 2.1-1: Vizient Q&A Scorecard Star Ratings for Denver Health

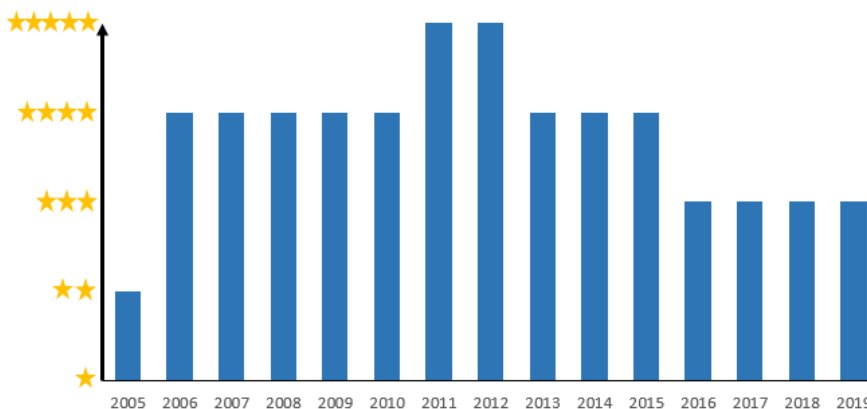
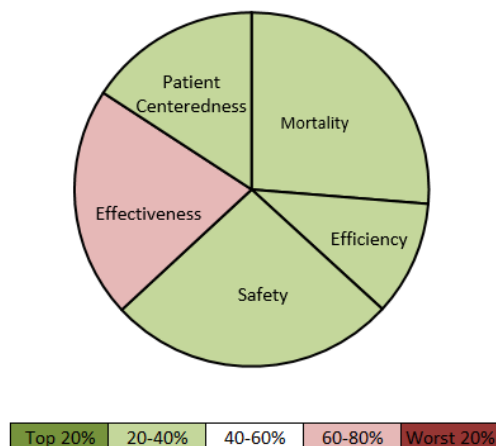


Figure 2.1-2: Vizient 2019 Q&A Scorecard Summary for Denver Health



Future Impact of 2020 Q&A

- ◇ Domain Weights: The Equity domain returns in 2020, thereby causing a restructuring of the weights (Mortality 25%, Safety 25%, Effectiveness 20%, Patient Centeredness 15%, Efficiency 10%, Equity 5%).
- ◇ Equity domain will look at gender, race, and socioeconomic status disparities in sepsis lactate timing, sepsis mortality, N-STEMI troponin timing, N-STEMI mortality, maternal hemoglobin level, maternal transfusions, heart failure BNP level, and heart failure mortality.
- ◇ Retired measures include the CMS core measures and HCAHPS pain management composite.
- ◇ The Patient Flow Committee will continue its work to decrease length of stay.
- ◇ Readmission reduction is an enterprise-wide focus for 2020, involving staff from DPSQ, ACS, medical providers, case management, and managed care.

Figure 2.1-3: Vizient 2019 Quality and Accountability Scorecard for Denver Health

Mortality* (26.3%)			
Vizient Service Line	O/E	Decile Rank	Compared to Q&A 2018
Cardiology	0.54	2 nd	▲
Cardiothoracic Surgery	2.09	10 th	n/a
Gastroenterology	0.37	2 nd	▲
Medicine General	0.79	3 rd	▼
Neurology	0.83	6 th	▼
Neurosurgery	0.75	4 th	▲
Oncology	0.34	1 st	▲
Ortho/Spine	0.75	5 th	▼
Pulmonary/Critical Care	0.99	7 th	▲
Surgery General	0.54	2 nd	▼
Trauma	0.83	4 th	▼
Vascular Surgery	1.16	9 th	▼

*Timeframe: July 2018 - June 2019

Patient Centeredness* (15.8%)			
HCAHPS Survey Dimension	% Top Box	Decile Rank	Compared to Q&A 2018
Nurse communication	78.53	8 th	▲
Doctor communication	81.06	6 th	▼
Pain management	70.05	2 nd	▲
Medication communication	71.72	1 st	▲
Cleanliness and quietness	65.63	4 th	▲
Responsiveness of staff	69.07	3 rd	▲
Discharge information	89.54	3 rd	▼
Overall rating of hospital	75.58	5 th	▼
Transition of care	50.04	9 th	▼

*Timeframe: April 2018 - March 2019

Efficiency* (10.5%)			
LENGTH OF STAY			
Vizient Service Line	O/E	Decile Rank	Compared to Q&A 2018
Cardiology	1.02	9 th	▼
Cardiothoracic Surgery	0.97	6 th	n/a
Gastroenterology	0.91	6 th	▼
Gynecology	1.01	7 th	▲
Medicine General	0.83	3 rd	▲
Neurology	1.02	7 th	▲
Neurosurgery	1.11	9 th	▼
Obstetrics	0.97	6 th	▲
Oncology	0.93	7 th	▲
Ortho/Spine	0.98	8 th	▼
Pulmonary/Critical Care	0.91	5 th	▼
Surgery General	0.89	6 th	▲
Trauma	1.00	8 th	▲
Urology	0.89	7 th	▲
Vascular Surgery	0.81	4 th	▲

DIRECT COST			
Vizient Service Line	O/E	Decile Rank	Compared to Q&A 2018
Cardiology	0.73	2 nd	▲
Cardiothoracic Surgery	0.72	2 nd	n/a
Gastroenterology	0.58	1 st	▼
Gynecology	0.77	4 th	▲
Medicine General	0.59	1 st	▼
Neurology	0.62	1 st	▼
Neurosurgery	0.70	2 nd	▼
Obstetrics	0.93	6 th	▲
Oncology	0.66	2 nd	▲
Ortho/Spine	0.80	3 rd	▼
Pulmonary/Critical Care	0.60	1 st	▼
Surgery General	0.63	1 st	▼
Trauma	0.87	5 th	▲
Urology	0.58	2 nd	▲
Vascular Surgery	0.81	4 th	▼

*Timeframe: July 2018 - June 2019

Safety* (26.3%)				
AHRQ PATIENT SAFETY INDICATORS				
Metric ID	Description	O/E	Decile Rank	Compared to Q&A 2018
PSI-3	Pressure ulcer	0.66	4 th	▼
PSI-6	Postoperative iatrogenic pneumothorax	0.50	4 th	▲
PSI-9	Postoperative hemorrhage or hematoma	1.12	8 th	▲
PSI-11	Postoperative respiratory failure	0.50	7 th	▼
PSI-13	Postoperative sepsis	0.19	1 st	▲
NHSN HEALTHCARE ASSOCIATED INFECTIONS				
Metric ID	Description	Rate / SIR	Decile Rank	Compared to Q&A 2018
CAUTI	Catheter-associated urinary tract infection	0.60	3 rd	▲
CLABSI	Central line-associated blood stream infection	0.91	9 th	▲
C-Diff	<i>Clostridioides difficile</i> infection	0.81	8 th	▼
SSI	Surgical site infections: colon	1.28	7 th	▼
OTHER				
Description	Rate / Percent	Decile Rank	Compared to Q&A 2018	
Total hip/total knee arthroplasty complication rate	0.00	1 st	▲	
Hypoglycemia and insulin use	1.2%	1 st	▲	
Elevated INR after warfarin administration	3.0%	6 th	▼	

*Timeframe: AHRQ & lab measures July 2018 - June 2019; NHSN & THK April 2018 - March 2019

Effectiveness* (21.1%)				
30-DAY ALL CAUSE UNPLANNED READMISSIONS				
Vizient Service Line	Rate (%)	Decile Rank	Compared to Q&A 2018	
Cardiology	12.1	9 th	▼	
Gastroenterology	16.7	10 th	▼	
Medicine General	17.1	9 th	▲	
Neurology	7.6	6 th	▼	
Neurosurgery	9.4	7 th	▲	
Oncology	13.8	6 th	▼	
Ortho/Spine	9.0	10 th	▼	
Pulmonary/Critical Care	11.1	4 th	▼	
Surgery General	13.4	10 th	▲	
Trauma	6.0	3 rd	▲	
Vascular Surgery	20.2	10 th	▼	
EXCESS DAYS				
Vizient Service Line	Days	Decile Rank	Compared to Q&A 2018	
Cardiology	0.03	7 th	▼	
Gastroenterology	0.12	8 th	▼	
Medicine General	0.03	6 th	▼	
Neurology	0.28	10 th	▼	
Neurosurgery	-0.02	3 rd	▼	
Oncology	0.06	7 th	▲	
Ortho/Spine	0.00	4 th	▲	
Pulmonary/Critical Care	-0.01	7 th	▼	
Surgery General	0.03	5 th	▲	
Trauma	0.11	9 th	▼	
Vascular Surgery	-0.13	3 rd	▲	
CMS CORE MEASURES				
Metric ID	Description	Minutes	Decile Rank	Compared to Q&A 2018
ED-2	Median time from admit decision to departure time for admitted patients	122	5 th	▼
ED-OP-18	Median time from ED arrival to departure for discharged patients	245	8 th	▲
LAB MEASURES				
Description	Rate (%)	Decile Rank	Compared to Q&A 2018	
Lactate level for sepsis patients not done within 12 hours of admit labs	1.84	1 st	▼	
Transfusion for hemoglobin ≥ 9 prior to first RBC transfusion	1.83	7 th	n/a	

*Timeframe: Readmissions/Excess Days July 2018 - May 2019 (Index); CMS Jan-Dec 2018; Lab measures July 2018 - June 2019

Outpatient* (Informational Only)		
Metric	Rate	Compared to Q&A 2018
Colonoscopy revisits	1.34	▲
Biliary procedure revisits	10.14	▼
Urological procedure revisits	4.33	▲
Arthroscopy procedure revisits	4.89	▼

*Timeframe: April 2018 - March 2019

2.2. Vizient Ambulatory Quality and Accountability (AQA) Scorecard

The Vizient Ambulatory Quality and Accountability (AQA) Scorecard provides a holistic view of ambulatory performance to enable institutions to deliver high quality, accessible, and cost efficient care. Fifty academic medical centers and their affiliate physician organizations participated in 2019. Organizations were ranked on five domains composed of 23 metrics and 138 sub-metrics. DHHA received three stars with its ranking of #21 (Figure 2.2-1). DHHA performed best in the domain of Quality and Efficiency (Figure 2.2-2). Performance on each metric is shown in Figure 2.2-3. Equity discrepancies reflect that Medicaid patients had timelier new patient visits in Primary Care and Commercial patients had timelier new patient visits at ENT, Infectious Disease, and Orthopedics clinics. In 2020, DHHA will work to improve access to care, especially in the specialty clinics.

Figure 2.2-1: Denver Health AQA Overall Rank



Figure 2.2-2: 2019 AQA Scorecard for Denver Health

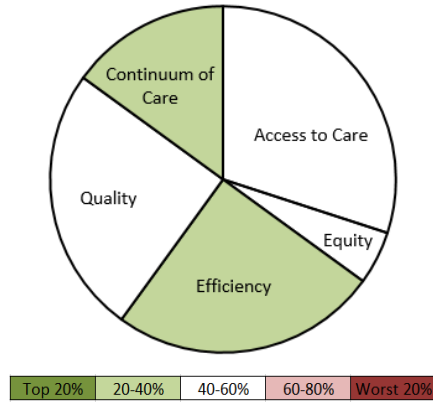


Figure 2.2-3: Vizient 2019 AQA Metrics for Denver Health

Domain	Metric	Specialty																
		Cardiology	Dermatology	Endocrinology	ENT	GI & Hepatology	Hematology & Oncology	Infectious Disease	Nephrology	Neurology	OB/GYN	Ophthalmology	Orthopaedics	Primary Care	Pulmonology	Rheumatology	Surgery	Urology
Access to Care	New patient visits (%)	15.3	42.4	25.0	40.9	34.7	13.0	20.2	24.3	29.7	5.6	25.1	18.4	9.6	23.1	14.0	27.4	26.5
	New patients seen within 10 days of scheduling an appointment (%)	27.5	27.3	41.4	25.4	61.3	38.1	81.2	--	28.8	29.8	63.6	46.9	39.7	24.6	64.3	30.1	32.8
	Median days from scheduling appointment to visit for new patients visits	16	48	14	35	8	16	0	--	24	23	6	12	22	20	8	21	21
Efficiency	Appointments cancelled by provider or clinic within 30 days of appointment date (%)	3.9	2.9	5.6	3.4	4.7	8.7	4.5	--	1.8	1.6	2.3	3.4	2.8	1.6	1.7	3.8	--
	Median encounters per provider per hour	1.2	2.3	1.5	2.2	1.3	1.7	1.3	--	1.0	1.6	2.0	2.0	1.9	1.3	1.3	1.0	1.4
	Consistency in encounters per provider per hour	0.5	0.9	0.4	0.7	0.5	0.7	0.5	--	0.5	0.8	1.1	0.7	0.7	0.5	0.5	0.6	1.0
Equity	ED median time for discharged patients (OP-18b)	245 minutes																
	Disparity in new patients seen within 10 days of scheduling an appointment by commercial vs. Medicaid payer	-	-	-	D	-	-	D	-	-	-	-	D	D	-	-	-	-

Continuum of Care Domain	
Metric	Performance
ED visits that are low acuity	44.7%
Patients with 4 or more ED visits per year	5.3%
Patients with return to ED within 7 days	8.9%
... dehydration	24.5%
... pneumonia	19.4%
... urinary tract infection	23.1%
... chronic obstructive pulmonary disease	23.0%
... heart failure	37.6%
... diabetes short-term complications	27.9%
... diabetes long-term complications	53.4%
... uncontrolled diabetes admission	35.0%
... lower extremity amputation diabetic admission	53.6%

Quality Domain		
Metric	Performance	
Hospitalization rate for ambulatory care-sensitive condition	Bacterial pneumonia (acute)	0.03%
	Urinary tract infection (acute)	0.02%
	Dehydration (acute)	0.04%
	COPD or asthma (chronic)	4.4%
	Heart failure (chronic)	15.8%
	Diabetes short-term complications (chronic)	0.5%
	Diabetes long-term complications (chronic)	1.1%
	Uncontrolled diabetes (chronic)	0.2%
	Lower extremity amputation diabetics (chronic)	0.2%
	Return within 7 days post outpatient procedure	Colonoscopy
Orthopedic procedures		4.4%
Urology procedures		4.8%

LEGEND	
Best Quartile	Low volume
25-50%	Significant Difference
50-75%	- is no difference
Worst Quartile	

2.3. Vizient Hospital Improvement Innovation Network (HIIN)

CMS funded two rounds of Hospital Engagement Networks (HEN and HEN 2.0) where significant progress was made nationally in keeping patients safe: 2.1 million fewer patients harmed, 87,000 lives saved, and \$20 billion in cost-savings. To continue these efforts, CMS awarded \$347 million to 16 hospital associations, Quality Improvement Organizations, and health system organizations for Hospital Improvement Innovation Networks (HIINs). The HIINs work to achieve a 20% decrease in overall patient harm and a 12% reduction in 30-day hospital readmissions over three years. Denver Health joined the Vizient HIIN in October 2016.

Benefits of HIIN Participation:

- Improve patient safety and avoid hospital-acquired conditions, penalties, and other costs.
- Head start on program requirements that may become mandatory later.
- Access to accurate, timely benchmarking and comparative reports that will leverage nationally endorsed, standardized measures.
- Opportunity to showcase accomplishments on both a local and national stage as well as receive considerable resources at no direct cost.

HIIN Initiatives Aligned with Target Zero:

- Central Line-Associated Blood Stream Infections (CLABSI)
- Catheter-Associated Urinary Tract Infections (CAUTI)
- *Clostridioides difficile* Infection
- Injury from Falls and Immobility
- Surgical Site Infections (SSI)

DHHA's Target Zero aligns with many of the chosen initiatives in the HIIN Collaborative. Our Target Zero interventions align with the HIIN measures. In 2018, based on the HIIN data collaborative, pressure injuries were identified as an area for improvement. This initiative was taken up by nursing leadership and continued in 2019. In addition, based on data from the HIIN collaborative, DPSQ reports Narcan use to the Inpatient Pain and Opioid Stewardship. Furthermore, HIIN data is used to inform the intensive care leadership of opportunities to prevent delirium. The HIIN will end in March 2020.

Figure 2.3-1: Hospital Improvement Innovation Network—Denver Health Performance

Harm	Baseline Period* Value	Performance Period** Value				Performance Period** Improvement Rate			Annualized Costs Avoided
		Best quartile	Better than median	Worse than median	Worst quartile	≥20%	< 20%	Worse than Baseline	
Adverse Drug Events: Anticoagulant†	49.04	51.02				- 4.0%			- \$5 K
Adverse Drug Events: Insulin†	79.35	24.66				68.9%			\$820 K
Adverse Drug Events: Opioids†	11.44	8.98				21.5%			\$137 K
CAUTI SIR	1.52	0.84				44.9%			\$14 K
C. difficile‡	9.27	7.12				23.2%			\$206 K
CLABSI SIR	1.94	0.89				54.0%			\$221 K
Iatrogenic Delirium†	8.21	11.21				- 36.5%			- \$216 K
Falls with Injury§	0.80	0.64				20%			\$87 K
Malnutrition§	63.88	80.96				- 26.7%			n/a
MRSA§	0.05	0.03				40.3%			\$36 K
Pressure Ulcers: Stage 2+§	0.89	1.45				- 62.9%			- \$190 K
Pressure Ulcers: Stage 3+§	0.57	0.31				45.6%			\$39 K
Potentially Unplanned Readmissions	22.89%	23.71%				- 3.6%			- \$1,787 K
Sepsis Mortality	6.19%	6.22%				- 0.5%			- \$9K
SSI SIR—Colon	1.78	1.72				3.5%			\$6 K
SSI SIR—Hysterectomies	2.60	0.62				76.1%			\$30 K
SSI SIR—Total Hips	3.66	1.65				55.0%			\$46 K
SSI SIR—Total Knees	0.83	2.35				- 183%			- \$18K
Ventilator Associated Event¶	49.37	9.13				81.5%			\$3,138 K
Venous Thromboembolism (Perioperative)†	11.64	6.32				45.9%			\$114 K

*Jan 2014—Sept 2016 except HAIs begin in Jan 2015 and VTE begins in Oct 2015. **October 2016—January 2019.

†Rate per 1000 patients. §Rate per 1000 patient days. ¶Rate per 1000 ventilator days.

2.4. Maternal Mortality: Severe Hypertension and Pre-Eclampsia Vizient Collaborative

Denver Health participated in Vizient's Maternal Mortality Collaborative that focused on severe maternal hypertension (HTN)/pre-eclampsia with the vision of improving and providing better quality of life for obstetric patients. The goal was to establish standardized processes, including plans of care for obstetric patients who present in crisis with quick medical interventions. Also, the collaborative aimed to identify ways to be proactive in the management of care of these patients.

Best practices implemented and maintained at DHHA during 2019:

- Review of maternal readmissions for opportunities to decrease readmissions related to HTN/pre-eclampsia
 - ◇ Inpatient fluid orders were modified to decrease fluid overload
 - ◇ Postpartum orders were added to ensure close monitoring of patient weights and fluid status to identify fluid overload issues before discharge
- Streamlined policies to align with recognized best practices:
 - ◇ Developed a written evidence-based procedure for measuring and re-measuring blood pressure of pregnant and postpartum women
 - Revised written procedures for managing pregnant and postpartum patients with severe HTN/preeclampsia
- Adopted an early recognition tool that guides staff about treatment of severe maternal HTN/pre-eclampsia
- Established a report to audit the compliance of maternal treatment of severe HTN/pre-eclampsia within 60 minutes of recognition (73% compliance). From this starting point, a plan was created to utilize this report for an ongoing improvement effort to increase toward a goal of 100% compliance.
- Education:
 - ◇ All staff caring for pregnant and postpartum women receive education in managing severe HTN and pre-eclampsia and established plans to implement Mock drills
 - ◇ Ensure all pregnant and postpartum women receive printed education on signs and symptoms of hypertension and preeclampsia
- Identified the current resources available to support patients, families and staff for ICU admissions and/or serious complications due to severe maternal HTN and pre-eclampsia
- Established a report to monitor that mothers are returning for appropriate postpartum blood pressure checks. This report helps to identify system issues when we discovered only 50% of women were returning for a blood pressure check.

Future Impact:

- Education plans for staff and patients created in this collaborative effort will be fully implemented in 2020.
- The work of this collaborative directly impacts our organizations ability to comply with the new Maternal Safety Joint Commission standards that become effective January 1, 2021.

2.5. Vizient Failure to Rescue Collaborative

Denver Health participated in Vizient’s Failure to Rescue Collaborative in an effort to implement an Early Warning System (EWS) as well as update the Rapid Response Process. A robust EWS identifies patient deterioration earlier and potentially decreases patient events such as code blues, transfers to a higher level of care, and/or changes in vital signs. The collaborative focused on:

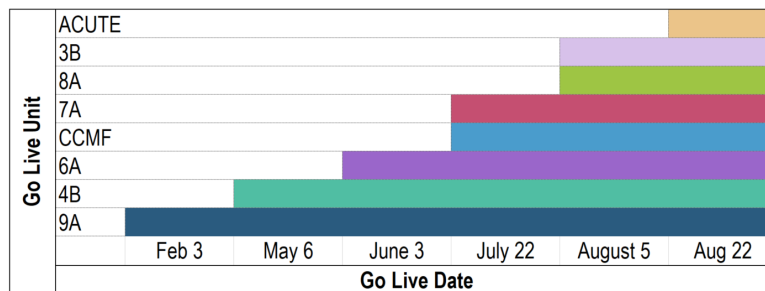
- Identification of an EWS
- Collecting baseline data
- Implementing an EWS
- Incorporating the EWS into a Rapid Response Process

The collaboration began in September of 2018. Between September 2018 and December 2019 the following tasks were accomplished:

- Epic’s Deterioration Index (DI) tool chosen as DHHA’s EWS
- Validation analysis conducted to ensure proper functioning of the DI tool
- DI thresholds established
 - ◇ Low risk: 0 to 29.9
 - ◇ Moderate risk: 30 to 60
 - ◇ High Risk: >60
- DI tool piloted on acute care floor (9A) starting on 2/1/2019
- Baseline unit specific data obtained and reviewed
- Deterioration Index adopted house-wide on all acute care floors
- Redesigned Rapid Response Process implemented (see Rapid Response Redesign Section for additional information)
- Proactive rounding process established using the designated rapid response nurse

In the summer of 2019, the formal collaboration ended; however, Denver Health has continued to move forward with the above items and review of outcomes. The deterioration index was rolled out across the acute care floors throughout the summer (Figure 2.5-1).

Figure 2.5-1: Denver Health’s Rollout of the Deterioration Index



While not statistically significant, DI yielded a 60% decrease in unexpected deaths, 30% decrease in total code blue events, and 11% decrease in unplanned ICU transfers (Figure 2.5-2).

Figure 2.5-2: Failure to Rescue Measures, Before and After Implementation of Epic’s Deterioration Index Tool

Measure (N, Rate / 1000 patients)	Pre-DI (2018)	Post-DI (2019)	P-value
On Unit Mortality	41 (2.49)	54 (3.60)	p > 0.05
Unexpected Deaths	10 (0.61)	4 (0.27)	p > 0.05
Expected Deaths	31 (1.88)	50 (3.33)	p = 0.01
DNR-Deaths	33 (2.00)	50 (3.33)	p = 0.03
Comfort Care Orders Deaths	26 (1.58)	42 (2.80)	p = 0.02
Total Code Blue	20 (1.21)	14 (0.93)	p > 0.05
Comfort Care Orders Placed	76 (4.62)	79 (5.26)	p > 0.05
Unplanned ICU Transfer	386 (23.44)	343 (22.84)	p > 0.05

2.6. Vermont Oxford Network (VON)

The Vermont Oxford Network (VON) is a voluntary collaborative focused on improving the quality and safety of medical care for newborn infants and their families through a coordinated program of research, education, and quality improvement projects. Data are used to analyze the care and outcomes of high-risk newborn infants for quality management, process improvement, internal audit, peer review, outcomes research, randomized clinical trials, and epidemiological studies. VON provides reports which benchmark center specific data to neonatal centers from around the world. Findings are important for the development of educational materials and programs for health care professionals, policy makers, families of high-risk infants, and the public.

VON's very low birthweight (VLBW) database includes infants born between 501 and 1500 grams. VLBW infants in Colorado had higher rates of chronic lung disease when born before 33 weeks gestation along with higher rates of death or morbidity (Figure 2.6-1). DHHA had higher intraventricular hemorrhage rates compared to the Colorado and national medians, in part due to a higher than typical volume of traumatic injuries. Mortality rates for VLBW infants at DHHA fell below the national median in 2019 (Figure 2.6-2). Reflecting a concerted effort at necrotizing enterocolitis (NEC) prevention, the NICU has experienced 0 cases of NEC for 3 consecutive years (Figure 2-6.3).

Figure 2.6-1: Vermont Oxford Network Key Performance Measures for 2019 Births

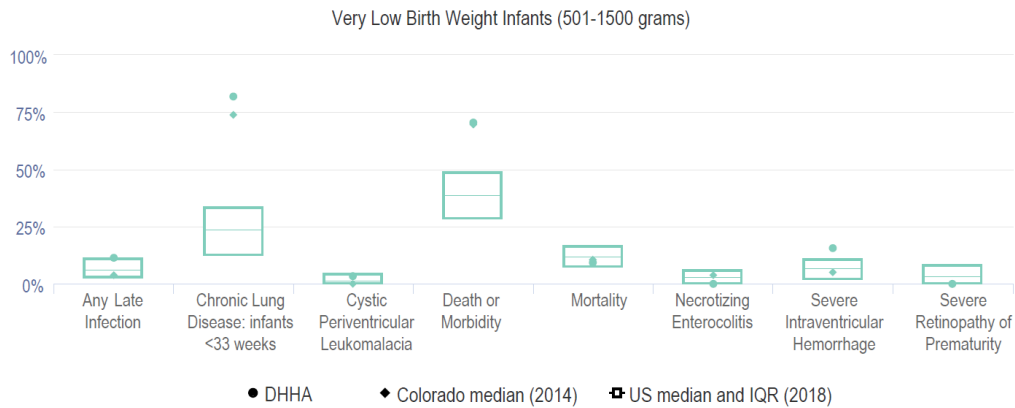


Figure 2.6-2: Denver Health Infant Mortality Rate for Very Low Birth Weight Infants

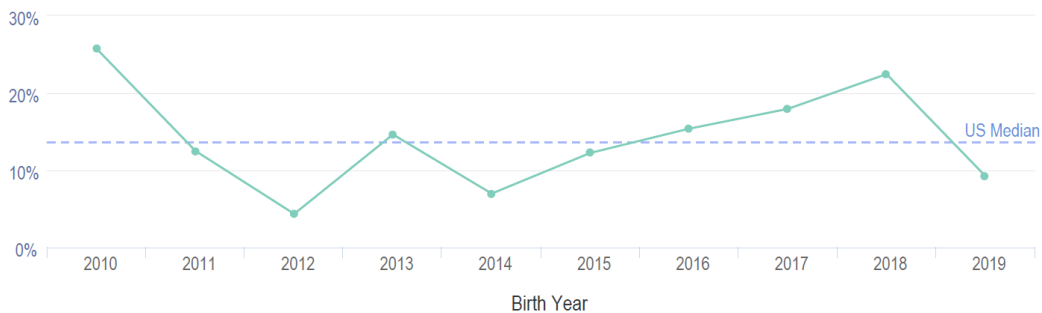
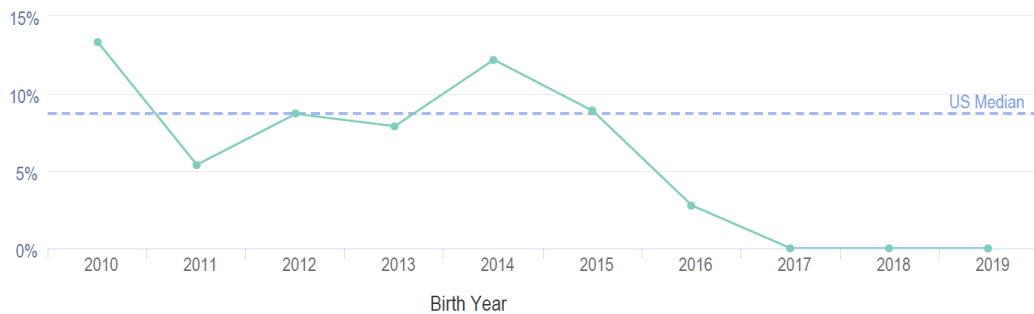


Figure 2.6-3: Denver Health Necrotizing Enterocolitis Rate for Very Low Birth Weight In-



2.7. American College of Surgeons Trauma Quality Improvement Program (TQIP)

The American College of Surgeons Trauma Quality Improvement Program (TQIP) has approximately 500 participating Trauma Centers throughout the United States. The program is designed to raise the bar for facilities providing trauma care. Its goals are to collect data from Trauma Centers, evaluate the data and provide feedback about each center's performance. Trauma centers are benchmarked against other facilities to provide best practice standards in trauma care. The data below are based on admissions from Quarter 2 2018 through Q1 2019.

Orthopedic Trauma Care

The goal in the elderly population of patients with hip fractures is to have definitive repair within 48 hours of admission. As identified in Figure 2.7-1, DHHA was 87.0% compliant with this measure compared to a 81.3% national average. This could be related to availability of operating rooms and recognition that this cohort of patients needs direct attention.

Figure 2.7-1: First Operative Internal or External Fixation in Elderly Patients with Isolated Hip Fracture

Group	Isolated Hip Fracture	Operative Fixation	Hours to Operative Fixation (Median [IQR])	Operative Fixation within 48 Hours of Admission
All Hospitals	40,294	89.6%	21.8 [15.9-30.1]	81.3%
DHHA	69	97.1%	19.5 [14.0-25.8]	87.0%

Neurological Trauma Care

Per TQIP data, in trauma centers nationwide, cerebral monitoring was present in 23.8% of Traumatic Brain Injury (TBI) cases whereas DHHA placed cerebral monitoring devices in 50.5% of TBI cases (Figure 2.7-2). This could be attributed to the injury severity of the cases and also the credentialing of Advanced Practice Providers (APPs) to perform this procedure as the APPs are always in the hospital, i.e. 24 hours per day, 7 days per week.

Figure 2.7-2: Cerebral Monitoring for Severe Traumatic Brain Injury Patients

Group	Severe Traumatic Brain Injury Patients	Cerebral Monitoring	Hours to Cerebral Monitoring (Median [IQR])
All Hospitals	23,883	23.8%	3.7 [2.2-9.1]
DHHA	97	50.5%	2.5 [1.7-5.2]

Surgical Trauma

As shown in Figure 2.7-3, 69.0% of hemorrhagic shock patients at DHHA received surgery for hemorrhage control compared to the national average of 53.0%. The median time to surgery was 24 minutes faster at DHHA than the national average of one hour. DHHA performed angiography more frequently than other trauma centers (23.8% vs. 17.6%) but it took longer for DHHA patients to get their angiography performed (4.6 hours vs. 2.9 hours).

Figure 2.7-3: Hemorrhagic Shock Management within First 24 Hours

Group	Hemorrhagic Shock Patients	Surgery for Hemorrhage Control	Hours to Surgery (Median [IQR])	Angiography	Hours to Angiography (Median [IQR])
All Hospitals	7,614	53.0%	1.0 [0.6-2.0]	17.6%	2.9 [1.6-4.6]
DHHA	42	69.0%	0.6 [0.4-1.5]	23.8%	4.6 [2.6-5.3]

Note: Patients may have both surgery for hemorrhage control and angiography.

Venous Thromboembolism (VTE) Prophylaxis

Overall, DHHA's trauma patients received their VTE prophylaxis one day earlier than the national median, thereby preventing more VTEs (Figure 2.7-4). DHHA's administration of VTE prophylaxis was better than or equal to the national average in all trauma cohorts. This is an improvement over the prior year and can be attributed to a hospital-wide focus on VTE prevention.

Figure 2.7-4: Pharmacologic VTE Prophylaxis by Cohort

Cohort	Group	Patients ¹	VTE Prophylaxis	Days to VTE Prophylaxis (Median [IQR])
All Patients	All Hospitals	298,248	67.9%	2 (1-3)
	DHHA	1,115	75.2%	1 (1-3)
Blunt Multisystem	All Hospitals	41,700	81.0%	2 (2-4)
	DHHA	210	85.7%	2 (1-4)
Penetrating	All Hospitals	13,373	81.6%	2 (1-2)
	DHHA	76	85.5%	1 (1-2)
Shock	All Hospitals	10,544	80.0%	2 (1-4)
	DHHA	56	83.9%	1 (1-3)
Severe TBI	All Hospitals	18,035	65.4%	3 (2-5)
	DHHA	76	69.7%	3 (3-4)
Elderly	All Hospitals	109,480	63.0%	2 (1-3)
	DHHA	227	75.8%	1 (1-3)
Elderly Blunt Multisystem	All Hospitals	10,536	75.4%	2 (2-4)
	DHHA	42	76.2%	3 (1.5-3.5)
Isolated Hip Fracture	All Hospitals	39,947	86.1%	2 (1-2)
	DHHA	69	98.6%	1 (1-2)

¹ Excluding deaths in the ED, deaths within the first 48 hours of arrival, and deaths with unknown time to death.

Risk-Adjusted Mortality

DHHA trauma mortality rates are amongst the lowest in the nation (Figure 2.7-5). Mortality rates for three of seven cohorts are in the lowest quintile, i.e. better than 80% of trauma centers nationwide.

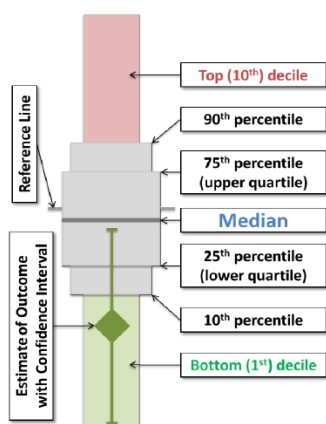
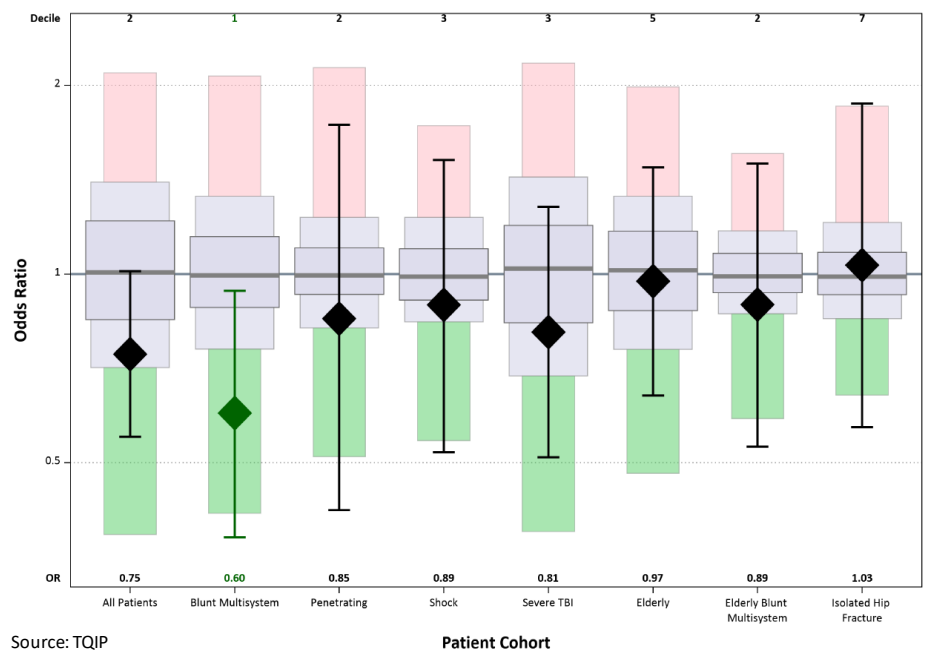


Figure 2.7-5: Risk-Adjusted Mortality by Cohort



Source: TQIP

3. INPATIENT SAFETY & QUALITY INITIATIVES

3.1. Target Zero

Target Zero is an enterprise-wide initiative to protect patients from preventable harm due to infections, falls, blood clots, and medication events (Figure 3.1-1). Denver Health began this strategic initiative in 2015 and for the fourth year in a row, DHHA achieved significant reductions in combined Target Zero events, most notably in the areas of C-Diff infections, medication safety events and central line-associated blood stream infections. DPSQ staff presented at the annual Vizient Conference demonstrating DHHA sustained year-over-year decline in preventable adverse events.

The Target Zero metric is a bundled measure of patient harm, based on a raw count of the following events:

Falls with Injury

Falls voluntarily reported in Safety Intelligence (SI) which led to moderate or major injury or death.

Medication Safety Events

Ambulatory or Inpatient events voluntarily reported in SI with a high harm score which indicates temporary or permanent harm or death. Pharmacy and DPSQ review each event to determine if it qualifies for Target Zero.

Surgical Site Infections (SSI)

Infection Preventionists (IPs) identify SSI after colon, breast, hip arthroplasty, knee arthroplasty, and abdominal hysterectomy procedures using National Healthcare Safety Network (NHSN) criteria from the Centers for Disease Control and Prevention (CDC).

Clostridioides difficile Infections (*C. difficile*)

Hospital-acquired *C. difficile* infections are identified by IPs using the CDC NHSN criteria, i.e. diagnosed in inpatients after at least two hospital days.

Catheter-Associated Urinary Tract Infections (CAUTI)

Hospital-acquired CAUTIs are identified by IPs using the CDC's NHSN criteria, i.e. inpatients with a urinary catheter who have a fever and positive urine culture.

Central Line-Associated Blood Stream Infections (CLABSI)

Hospital-acquired CLABSIs are identified by IPs using the NHSN definition.

Venous Thromboembolism (VTE)

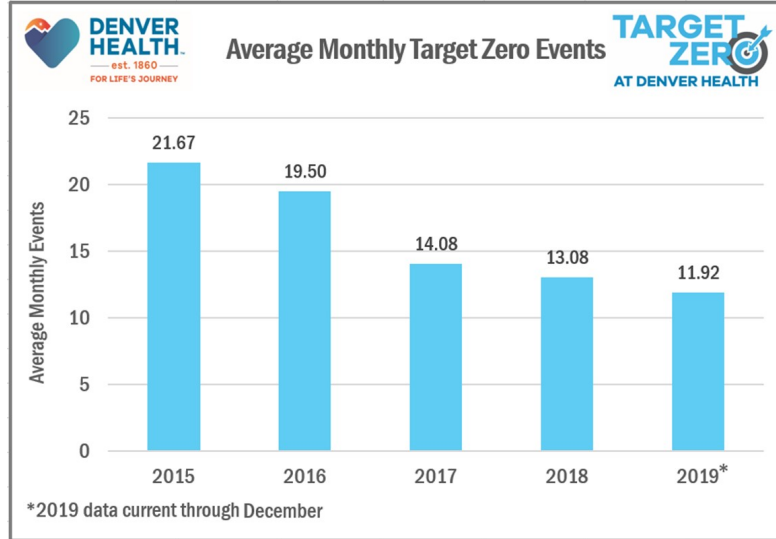
Hospital-acquired venous thromboembolism, i.e. pulmonary embolism or deep vein thrombosis based on final billing diagnoses.

Figure 3.1-1: Target Zero Events

Event Category	2015	2016	2017	2018	2019	% Change Since 2018	% Change Since 2015
<i>C. difficile</i>	95	93	68	81	49	-40%	-48%
CAUTI	40	33	21	11	32	191%	-20%
CLABSI	32	20	10	11	5	-55%	-84%
Falls with Injury	24	10	9	9	11	22%	-54%
Med Safety Events	4	12	5	6	1	-83%	-75%
Venous Thromboembolism	43	44	29	28	24	-14%	-44%
Surgical Site Infections	24	23	28	12	16	33%	-33%
Total	262	226	170	158	138	-13%	-47%

Lives impacted: 356 more patients would have suffered harm in 2016-19 had rates remained at 2015 levels.

Figure 3.1-2: Average Monthly Target Zero Events



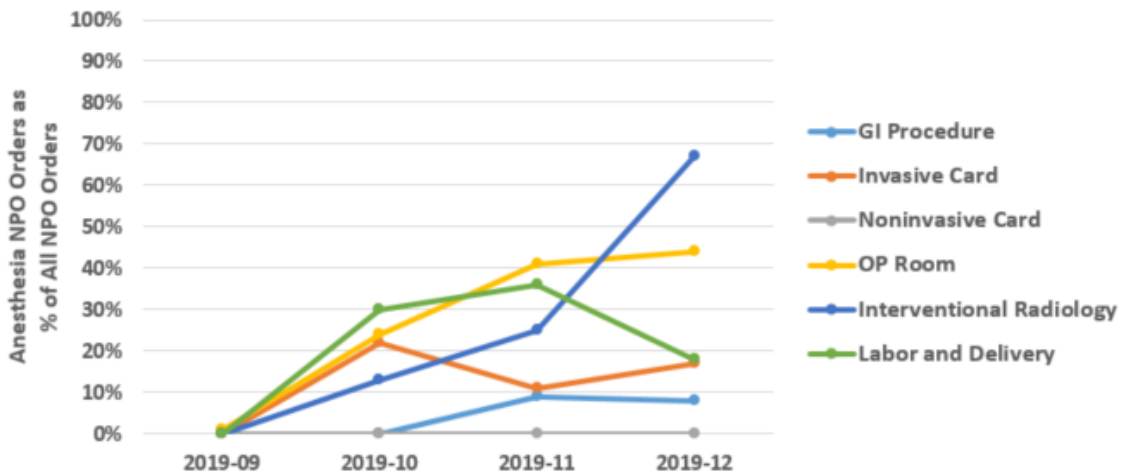
Goals of Target Zero:

- Every hospital employee can identify Target Zero as a major hospital safety initiative.
- Every inpatient unit staff member can name at least one component of the Target Zero Metric.
- Every inpatient unit manager regularly accesses unit-specific performance to share with teams.
- Visual management boards reflect local performance on Target Zero components.
- Safety measures designed to prevent harm are followed 100% of the time.
- DHHA experiences sustained year-over-year decline in preventable adverse events.

3.2 Pre-Procedure Dietary Orders

Denver Health embarked on an effort to improve comfort and safety for patients awaiting surgery. Previously, DHHA had one standardized order—“nil per os (NPO) after midnight”, i.e. nothing through the mouth after midnight. A multi-disciplinary team used evidence-based Enhanced Recovery After Surgery (ERAS) principles to create a new “NPO per Anesthesia” order set, which was designed to provide more liberal diet and oral fluid orders. Effective October 1, 2019, this order set became the default dietary option for elective inpatient surgical cases. Dietary and cafeteria staff are alerted that the patient is NPO, thereby disallowing the patient from ordering food from the cafeteria. Nursing staff, however, can provide the patient with nutrition items from their unit’s floor stock. The NPO per Anesthesia order set is being used in all surgical areas (Figure 3.2-1).

Figure 3.2-1 Pre-Procedure NPO Orders



3.3. Pain and Opioid Stewardship

The opioid crisis continues to be a national epidemic. For the last two years, DHHA focused on decreasing opioid prescriptions, educating staff and monitoring clinical practice. The Inpatient Pain and Opioid Management Committee, comprised of a multidisciplinary group of inpatient providers, is dedicated to this work.

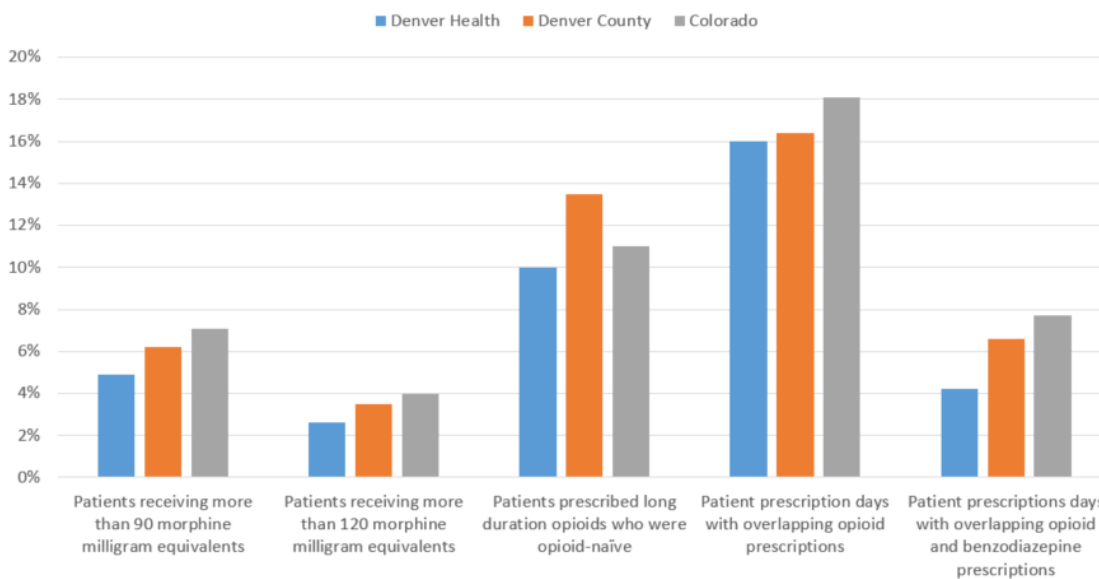
Goals of the Inpatient Pain and Opioid Management Committee:

- To ensure that the inpatient pain and opioid management processes of care at DHHA reflect evidence-based standards of care
- To ensure education of staff regarding pain and opioid management
- To monitor metrics related to inpatient pain and opioid management
- To oversee patient care related policies, procedures, clinical practice guidelines, and clinical resources related to inpatient pain and opioid management
- To review and provide feedback to departmental leadership on departmental and organizational performance improvement activities and goals related to inpatient pain and opioid management
- To provide guidance on the annual and long-range strategic priorities for inpatient pain and opioid management

2019 Inpatient Pain and Opioid Management Accomplishments:

- Placed information on elevators about opioids and addiction as a way to visually engage our patients and staff in the efforts to address the opioid crisis
- Created reports to monitor the use of the opioid reversal medication (Narcan) and confirmed safe opioid administration practices throughout Denver Health
- A pharmacist identified opportunities for future projects to improve our discharge prescribing habits of opioids and Narcan
- Reviewed and updated 35 inpatient pain order sets to assist with appropriate care and safer management of pain. These Nearly 53,000 orders were placed in 2019 using these order sets.
- Re-vamped and deployed inpatient nursing pain management education
- Deployed provider pain management education
- Celebrated “Top Box” HCAHPS scores for patient satisfaction about pain management
- Improved our nursing post-intervention pain reassessments by 25% and sustained these efforts for the last six months in 2019
- 661 Medication Assisted Therapy (MAT) inductions in the ED and Hospital. This is up from 531 in 2018 and 178 in 2017. A new mobile application was created to guide providers on the MAT process.

Figure 3.3-1 Colorado Prescription Drug Monitoring Program (PDMP) 2019



3.4. COR Zero, ICU Transfers and Bouncebacks

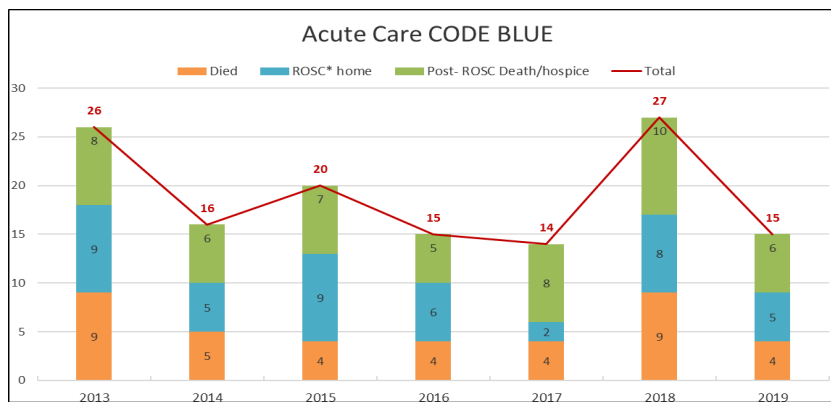
Denver Health is committed to providing care at the right time and in the right setting. In an effort to ensure high quality of care is provided, DPSQ has standard work in place to review the clinical care of patients who required a rapid assessment.

Coronary/Respiratory Arrest, aka COR Zero

A review of all medical emergencies and surrounding processes is conducted by the Code Blue Committee. In 2019, there were 15 “Code Blue” events (Figure 3.4-1). Based on a review of Safety Intelligence (SI) events in 2018, a significant opportunity was identified to improve escalation of care. Historically, DHHA’s rapid response system was based on single parameter triggers, such as an abnormal vital sign, with subsequent notification to a provider. Single parameter triggers are not the best reflection of patient deterioration and therefore the rapid response was not seen as valuable by clinicians and offered little impact to patient outcomes. In 2019, DHHA implemented Epic’s Deterioration Index (DI) tool as an adjunct to nursing clinical judgement. The DI tool was piloted on a single unit, which showed a decrease in Code Blues from eight to one in similar time periods.

Through the successful implementation of the DI tools in conjunction with the anticipated changes in the Rapid Response model in 2020, DHHA hopes to achieve a significant decrease in Code Blues and an increase in activations of the Rapid Response system.

Figure 3.4-1: Acute Care COR Zero / Code Blue



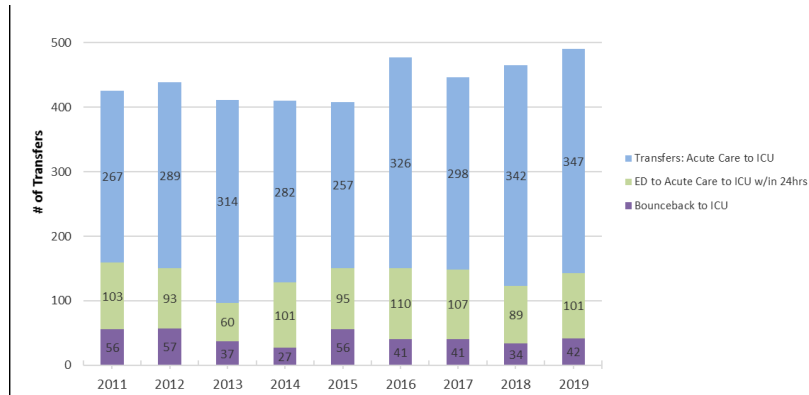
*ROSC: Return of Spontaneous Circulation

Intensive Care Unit (ICU) Transfers & Bounce Backs

Total ICU transfers from acute care units increased to 490 in 2019 from 465 in 2018 (Figure 3.4-2). After a careful analysis of the events, the contributing factors for the majority of transfers in 2019 were related to: respiratory conditions, cardiac conditions, and sepsis co-morbidities. DPSQ staff evaluate the automated sepsis notification for ED patients meeting sepsis criteria to ensure that the Sepsis bundle is implemented within industry timeframes and benchmarks. There is no automated notification currently for inpatients on acute care units that meet the sepsis criteria, but this is being considered for 2020.

Patients who are transferred from the ICU to a lower level of care and then return to the ICU within 48 hours are considered ICU Bounce Backs and are reviewed for appropriateness of care. The number of Bounce Backs increased to 42 in 2019 from 34 in 2018. An analysis of the 42 cases did not demonstrate any particular trend.

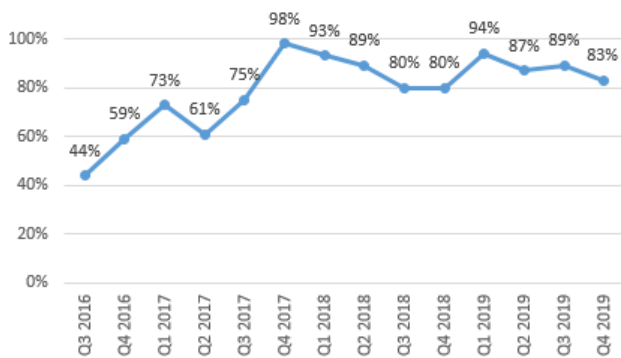
Figure 3.4-2: Patient Transfers 2011—2019



3.5. Procedural Sedation

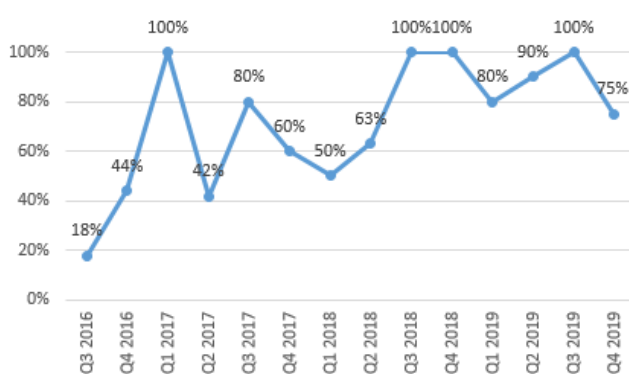
Procedural Sedation is a high-risk intervention that requires well written guidelines for physician, nurse and respiratory therapist training, practice, and ongoing competency. These procedures are performed by non-anesthesiologists for planned sedation cases on non-intubated patients. The Procedural Sedation Committee reviews data and makes recommendations to ensure ongoing performance improvement. The graphs display the bundle pass rate for outpatient and inpatient documentation (Figures 3.5-1 and 3.5-2).

Figure 3.5-1: Outpatient Procedural Sedation Bundle Pass Rate



Outpatient areas include: Cardiology, GI Lab, IR, ED, PEDUC, OMFS, Bronchoscopy Lab and Winter Park Clinic

Figure 3.5-2: Inpatient Procedural Sedation Bundle Pass Rate



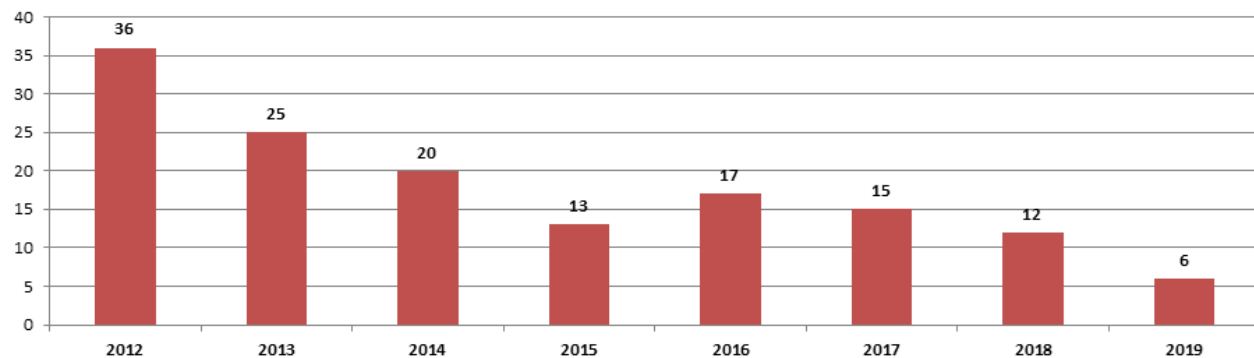
Inpatient areas include: MICU, PICU, SICU, PCU, and NICU

Procedural Sedation Occurrence/Safety Events

Procedural sedation related safety events are self-reported in Safety Intelligence. The data demonstrate the volume of safety events related to procedural sedation has declined over the past eight years (Figure 3.5-3). A procedural sedation safety event is defined as a procedure in which any of the following occur:

- change in respiratory status requiring assisted ventilation
- significant sustained decline in pulse oximetry
- need for reversal agents
- significant changes in BP or HR
- termination of the event due to inability to establish sedation
- patient becomes unresponsive to commands or stimulation in a conscious sedation procedure
- an unplanned admission because of procedural sedation

Figure 3.5-3: Procedural Sedation Events



*Raw number of safety events that occurred each year in the procedural sedation areas: Emergency Department (ED, PEDU, and Winter Park), Invasive and Non-Invasive Cardiology, Interventional Cardiology, GI Lab, Bronchoscopy, Oral Maxillofacial Services, Adult Critical Care (MICU, SICU, PCU), and Pediatrics (PICU and NICU).

3.6. Titration Order Redesign

Titration orders are implemented for patients when medication doses vary based on other physiological values such as blood pressure and/or electrolyte parameters. The titration of high risk medications is a focus of The Joint Commission. In preparation for DH's upcoming triannual survey, DPSQ realized that compliance with titration medications needed improvement. It was observed that nurse interpretation and administration of titrated medications varied. In 2019, DPSQ worked diligently with pharmacy, Epic and intensive care units educating, and ensuring the appropriate interpretation of written orders. Pharmacy reviewed and updated all the titration orders with required components. The Epic Willow team was instrumental in building and updating the orders. Staff are encouraged to submit a Safety Intelligence report if a potential adverse event occurs while using a titration order. Pharmacy and DPSQ review all relevant medication events to ensure patient safety.

3.7. Diabetes Program

2019 was a robust year for diabetes-related educational offerings at DHHA. Inpatient and outpatient certified diabetes care and education specialists collaborated extensively to offer a series of continuing educational opportunities for front-line healthcare professionals caring for people with diabetes. The two largest educational offerings were:

- Diabetes in Pregnancy for Healthcare Professionals (April 2019)
- D.I.A.B.E.T.E.S Conference at Denver Health (November 2019)

The Diabetes in Pregnancy Conference marked the first time Denver Health provided an educational opportunity focused exclusively on the care of diabetes during pregnancy. Participants included Denver Health staff as well as other healthcare professionals from outside the organization. Almost 40 people attended, and as a result of attending, 84% expressed intent to change their practice as a result of attending the conference.

The two-day D.I.A.B.E.T.E.S Conference was also a great success, with both days of the conference selling out. More than 60 healthcare professionals attended each day of the D.I.A.B.E.T.E.S Conference and 14 nursing continuing education credits were offered. Over 90% of participants who returned evaluations "agreed" or "strongly agreed" that they were likely to change their practice as a result of attending this offering. For the first time ever, the D.I.A.B.E.T.E.S Conference also included a live panel discussion with people who have diabetes. Numerous participants commented on the valuable impact of this session.

This conference has historically been offered every year, but this year the planners introduced a new format and fresh content. New topics included:

- The gut microbiome
- Obesity and diabetes
- Type 2 diabetes in pediatric patients
- Nutrition in specialty populations with a dual diagnosis, including chronic kidney disease, gastroparesis, non-alcoholic fatty liver disease, and bariatric surgery
- Bias, stigma, and language when providing diabetes education
- Mental health and diabetes

Numerous posters were also created by DHHA diabetes champions and displayed throughout the conference. Poster topics included: Food insecurity, Breastfeeding and Diabetes, Insulin pumps, Continuous Glucose Monitoring (CGM) Devices, Gut Microbiome, GLP-1 Receptor Agonists, Diabetes in Older Adults, Hypoglycemia, and Diabetic Ketoacidosis prevention/sick day management.

Other educational offerings this year included:

- Ongoing lunch and lunch series for inpatient and outpatient diabetes champions
- Diabetes education for nurses participating in the Essentials of Critical Care Orientation (ECCO)
- Inpatient glucose management for new graduate hires at Denver Health
- Diabetes care and inpatient glucose management for nursing student groups rotating through Denver Health
- Presentations on CGM device implementation, application, and data interpretation for nurses, pharmacists, and providers (inpatient and ACS)

For 2020 the Diabetes team at DHHA is looking forward to creating more original content and useful educational resources for staff.

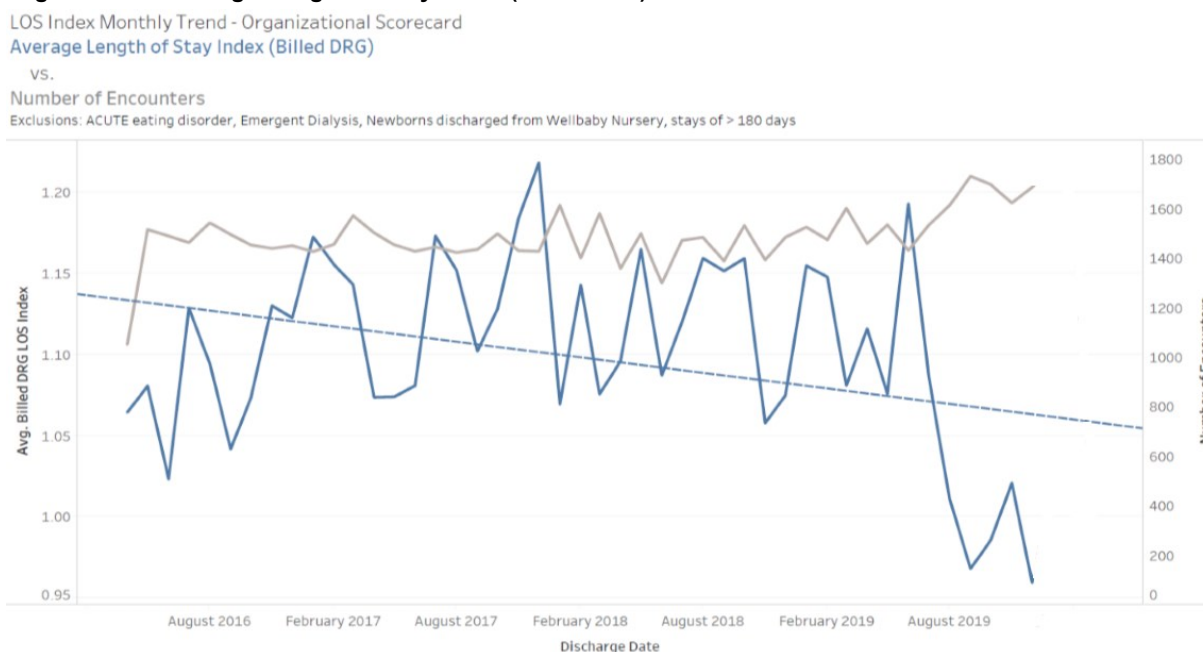
3.8 Patient Flow Workgroups / Length of Stay

A multidisciplinary workgroup continued its work to improve patient flow and reduce length of stay in 2019. Colorado’s Department of Healthcare Policy and Financing (HCPF) provided hospitals with access to Altarum’s PROMETHEUS tool to identify areas of opportunity. The PROMETHEUS tool grouped Medicaid fee-for-service claims and Medicaid managed care encounters into episodes of care (EOC) based on clinically-related services for a discrete condition or procedure. The services provided, outcomes, and associated costs for each EOC are compared against best practices to identify any inefficiencies, i.e. Potentially Avoidable Complications. The Patient Flow Workgroup also analyzed internal data to determine additional opportunities for improvement. Three focus areas were identified and interventions were deployed beginning in July 2019:

- **Septicemia**—Inconsistencies in antibiotic selection were identified for patients with septicemia (DRG 720). Guidelines were created to standardize care, such as how long a patient should remain on IV antibiotics, when to transition the patient to oral antibiotics, and discharge plans.
- **Vaginal and Cesarean Deliveries**—Women having vaginal and cesarean deliveries (DRG 540 and DRG 560, respectively) had longer lengths of stay at Denver Health compared to other hospitals. Interventions included communicating to staff that patients with vaginal deliveries can discharge on post-partum day 1 and cesarean sections on post-op day 2 and adding nighttime lactation consultation. Furthermore, attending providers began attending afternoon patient rounds to ensure that couplets (mother and baby) who were ready for discharge together were prioritized.
- **Behavioral Health**—Patients with Schizophrenia, Bipolar, and Major depressive disorders (DRGs 750, 751, 753) were identified as having longer than expected length of stays. Providers were educated on expected length of stays for patients with these conditions and opportunities were identified to improve patient flow.

Length of Stay (LOS) Index is the ratio of a patient’s actual length of stay to the expected length of stay for the patient’s diagnosis related group (DRG). Denver Health’s average LOS index decreased dramatically once the interventions began in mid-July 2019 (Figure 3.8-1). Pre-interventions the average LOS Index was 1.20 (January—July 2019) and post-interventions the average LOS index was 1.02.

Figure 3.8-1: Average Length of Stay Index (Billed DRG)



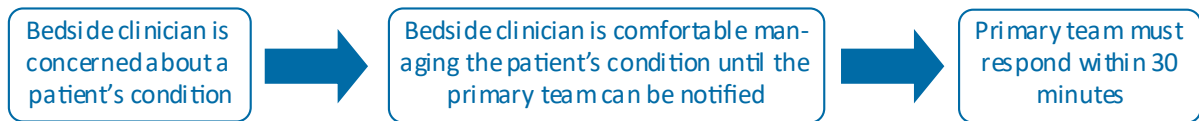
3.9 Rapid Response System Redesign

Denver Health set a goal in 2019 to integrate an Epic predictive model, known as Deterioration Index (DI), into clinical workflows with the ultimate outcome of redesigning the system’s rapid response process. Historically the rapid response system was based on single parameter triggers, such as an abnormal vital sign, with subsequent notification to a provider. Single parameter triggers are not the best reflection of patient deterioration, and therefore the rapid response system was not valued by clinicians and offered little impact on patient outcomes.

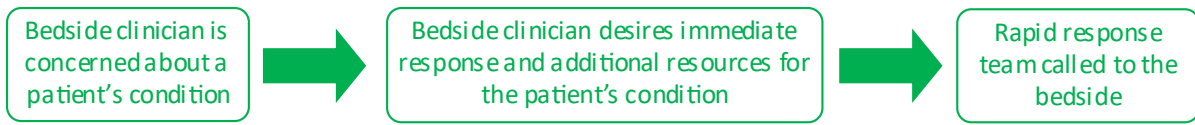
Epic’s Deterioration Index tool provides a “risk” score for patients. It helps identify patients who are experiencing clinical deterioration. Implementation of DI on a single pilot unit showed a decrease in Code Blues from eight to one in similar time periods. After success on the pilot unit, DI was implemented on the remaining acute care floors.

A multidisciplinary team (Rapid Response Improvement Taskforce) conducted a review of literature and best practices to understand rapid response systems. The team took their findings and developed a new rapid response system. This new system eliminated the single parameter criteria and focused on the bedside clinician’s concerns for patient deterioration, which may include a worsening DI score. If the bedside clinician develops concerns for a patient, the clinician now has two tiers for escalation.

Tier #1 – Escalation Huddle



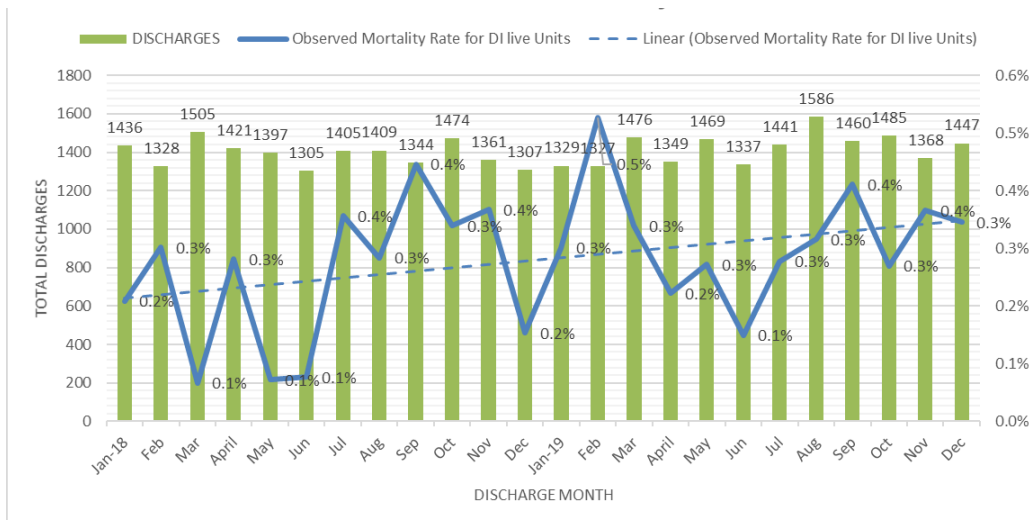
Tier #2 – Rapid Response



To implement the tiered approach, DHHA resourced a staffing expansion and now has 24/7 coverage of a Rapid Response nurse. In addition to responding to rapid response calls, the rapid response nurse conducts proactive rounding on all patients with a high risk DI score or elevation in Sepsis Score (another Epic predictive model), as well as recent transfers from intensive care units. The rapid response system redesign went live on December 16, 2019.

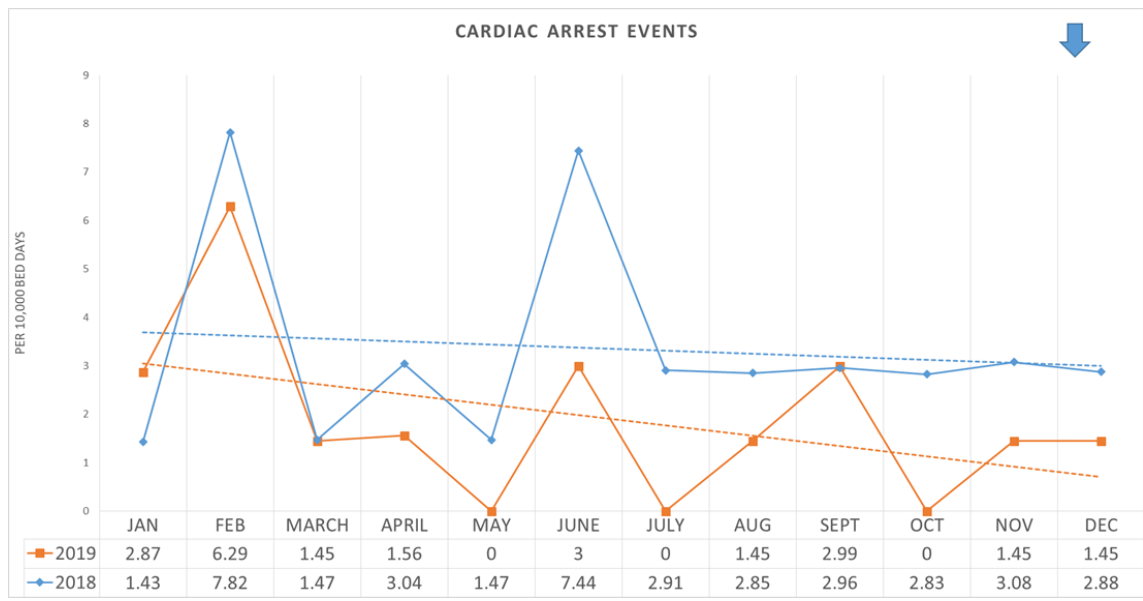
The primary outcome is inpatient mortality rate. The mortality rate on units using DI has slightly increased over the past two years (Figure 3.9-1). The impact of the redesigned rapid response system will be evaluated in 2020.

Figure 3.9-1: DHHA Mortality Rate



The greatest improvement has been in Cardiac Arrest Events per 10,000 bed days (Figure 3.9-2). Proactive rounding by charge nurses on patients with a DI score greater than 45 brought interventions to the bedside earlier and therefore avoided cardiac arrests.

Figure 3.9-2: DHHA Cardiac Arrest Events



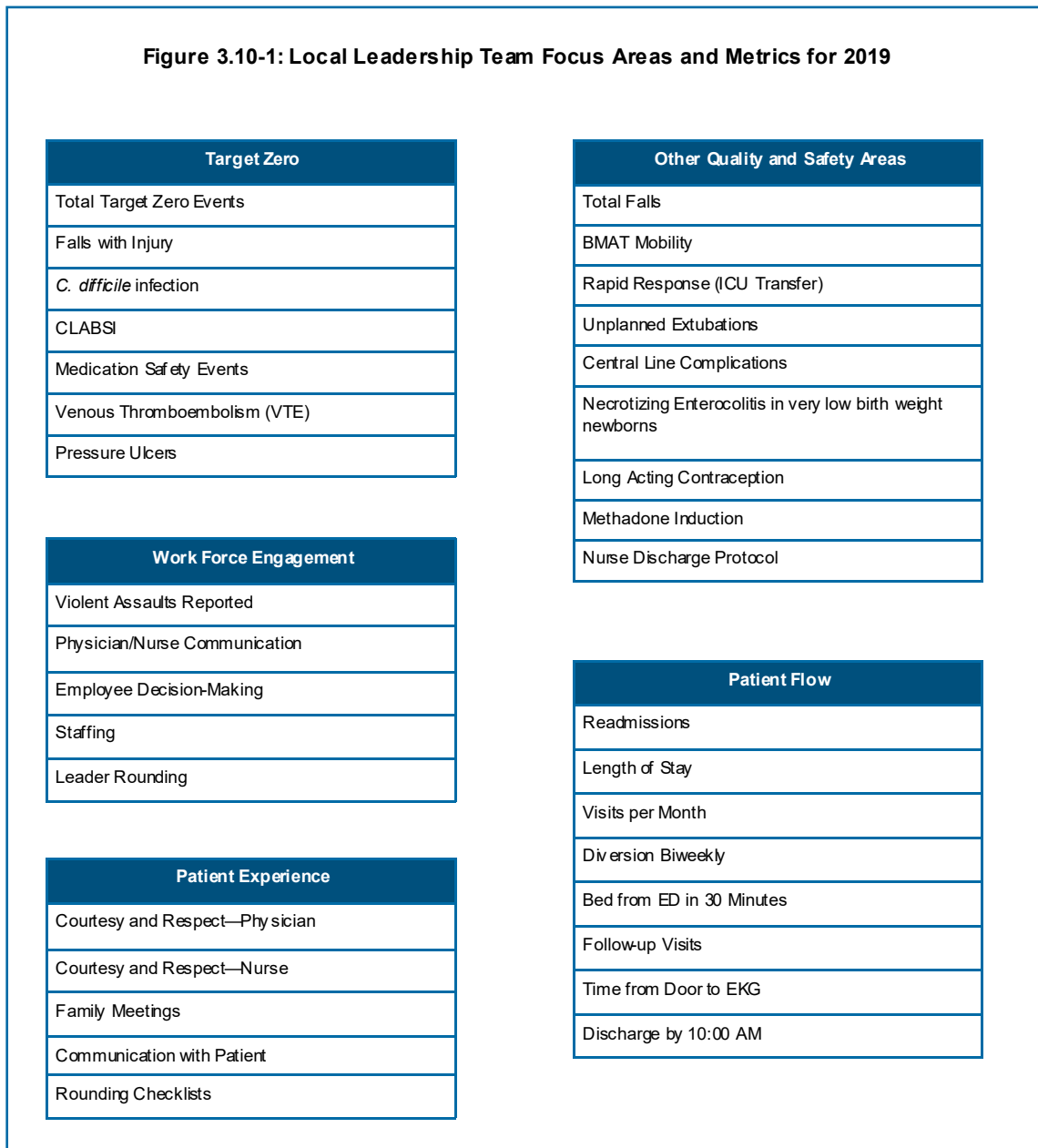
3.10 Local Leadership Teams (LLT)

Local Leadership Teams are partnerships composed of the unit Nurse Manager, Physician Leaders and an executive coach. The goals of the LLT teams are:

- To support leaders who are driving local performance improvement efforts
- To align unit-based improvement work with the enterprise strategic plans
- To support an infrastructure of continuous improvement using well designed measures.

Each LLT chose their top three focus areas and related metrics for 2019, referred to as the LLT Bundle. One of the metrics needed to focus on Patient Experience, while the other two were the choice of the LLT (Figure 3.10-1). For the 20 active teams in 2019, progress on each team’s three goals was tracked. Each metric was worth up to three points based on the goal level attained (Threshold=1 point, Target=2 points, and Stretch=3 points). Each team could achieve a maximum of 9 points. Based on the model in Ambulatory Care, an overall bundle of performance was designed that reflected achievement on goals for each team. At year end, the final bundle score was 65 points, which exceeded our target goal. This work will continue into 2020 with the inclusion of 5 additional teams.

Figure 3.10-1: Local Leadership Team Focus Areas and Metrics for 2019



4. INPATIENT NURSING SENSITIVE INDICATORS

4.1. National Database of Nursing Quality Indicators (NDNQI)

The National Database of Nursing Quality Indicators (NDNQI) provides dynamic analytics to support the significance of nurse sensitive measures. NDNQI is the only national nursing database that provides quarterly and annual reports for structure, process, and outcome indicators to evaluate nursing care in promoting quality patient care.

DHHA works in partnership with NDNQI in order to aid our nursing staff in patient safety and quality improvement efforts by providing research-based, national, comparative data on nursing care and the relationship of this care to patient outcomes. The data collected and reported to NDNQI is used to meet regulatory requirements and promote improved quality of patient care.

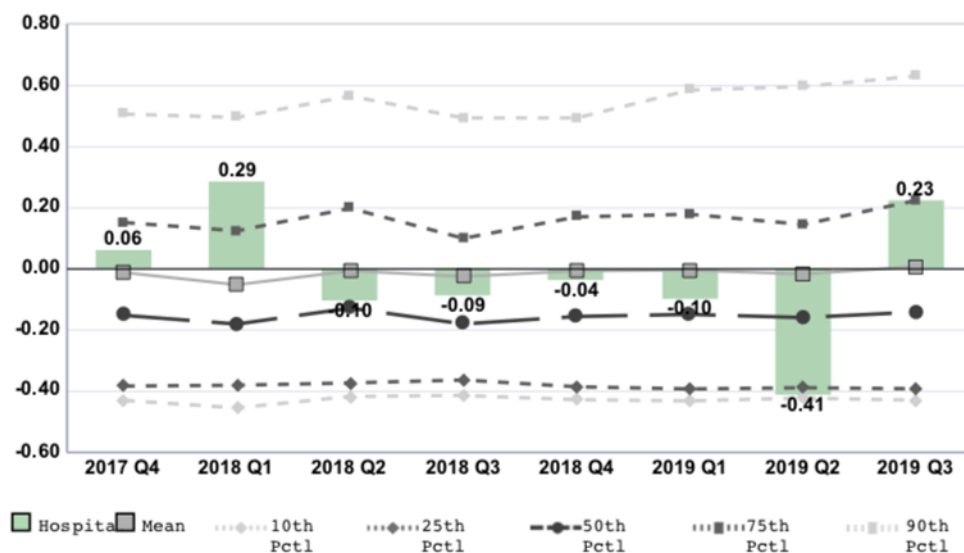
4.2. Hospital-Acquired Pressure Injuries (HAPI)

Pressure injuries related to moisture issues continue to be an important issue for DHHA in 2019. Wound Care Nurses and staff from the Nursing Education and Research Department led an NDNQI pressure injury data collection team that included didactic and hands-on components. For 2019, this team met on February 13th, May 15th, August 20th, and November 14th.

The origin of pressure injuries must be determined (hospital acquired or community acquired) for patients with pressure injuries. Calculation of the Hospital-Acquired Pressure Injuries (HAPI) rate requires the medical record of any patient with a pressure injury at the time of the survey be examined for evidence of a pressure injury on admission. If a review of the patient record finds no evidence of the pressure injury on admission (present on admission), then the pressure injury is considered “hospital-acquired”.

Figure 4.2-1 displays the most current NDNQI quarterly report of DHHA's HAPI performance against DHHA's comparison group. According to this report, DHHA's HAPI performance was better than benchmark from Q2 2018 to Q2 2019. In Q2 2019, DHHA was in the best decile of hospitals.

Figure 4.2-1: NDNQI Pressure Injury Outcomes, Stage II and Above



Multiple initiatives were introduced by the Wound Care Team in 2019 to reduce HAPI:

- A wound photography and pressure assessment policy was written and approved.
- All inpatient nurses were assigned the NDNQI HAPI Module as education for pressure injury assessment and treatment. All inpatient nurses completed the module in August 2019. This module is assigned to new hired inpatient nurses as well.
- A collaborative adjudication process of HAPIs began in May 2019. This process included DPSQ, Nursing Education and Research, and the Wound Care teams. The adjudication process was developed in 2019 and enhancements are planned in 2020.

4.3. Patient Falls

Denver Health is dedicated to fall prevention. Patient falls is a component of Target Zero and falls prevention is a requirement for The Joint Commission. Falls are voluntarily reported in Safety Intelligence. A thorough adjudication process is done to determine if the reported event meets the NDNQI definition of a fall, i.e. “a patient fall is a sudden, unintentional descent, with or without injury to the patient, that results in the patient coming to rest on the floor, on or against some other surface (e.g., a counter), on another person, or on an object (e.g., a trash can)”. Preventing patient falls is complex and requires a collaborative, multidisciplinary approach utilizing an evidence-based, data-driven implementation process. Falls prevention work began at DHHA in 2017 and continued to evolve through 2019.

Fall Reduction

DHHA has seen a reduction in falls for the fourth consecutive year. The 2019 fall reduction goal was 5%. Hospital wide, there was an 8% decrease in total falls between 2018-2019, and a 33% decrease in total falls between 2016-2019 (Figure 4.3-1). Furthermore, per NDNQI, DHHA has been better than benchmark the past 8 quarters and even ranked among the best quartile of hospitals in total falls in Q1 2019 (Figure 4.3-2).

Figure 4.3-1: Number of Total Falls for 2016—2019

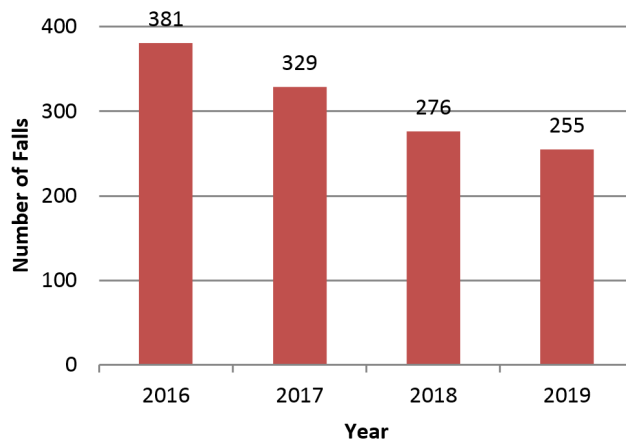
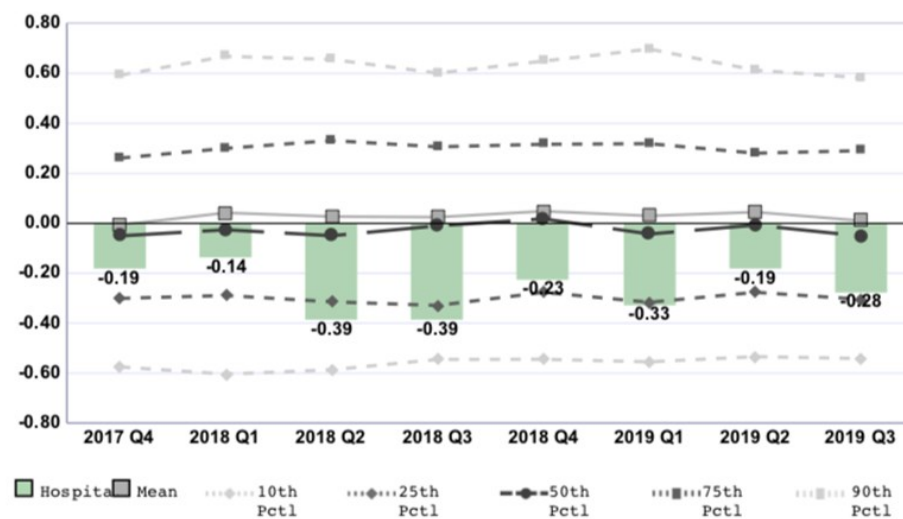


Figure 4.3-2: NDNQI Total Falls per 1000 Patient Days for Inpatient Units



Fall prevention was a major focus of the Acute Care Division and Behavioral Health Division. In 2019, the goal was to maintain and sustain fall prevention efforts implemented in 2018.

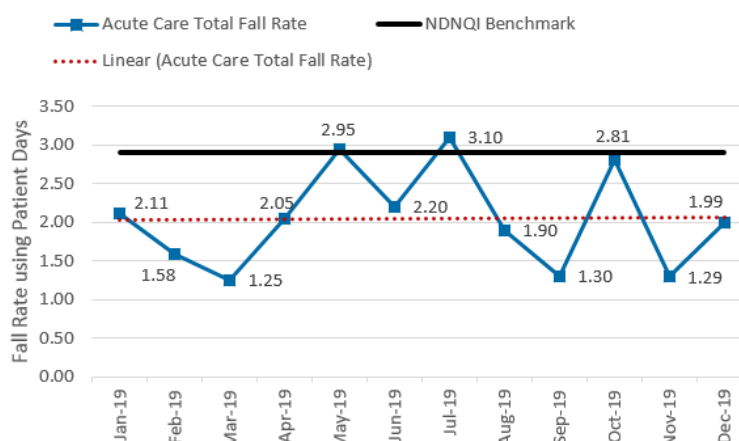
Acute Care Division Fall Prevention

Acute Care continued their progress from 2018. There was a 33% decrease in the number of total falls from 2017-2019. In 2019, the Acute Care Division continued to maintain its efforts of reduction (Figure 4.3-3).

Acute Care Division initiatives and work summarized as follows:

- Validated the high risk fall threshold for the Hester Davis fall risk model and decided to maintain a threshold of 15.
- Increased awareness and accountability with revisions to the standard work.
- Maintained “The Big 3” of fall prevention.
 - ◇ Arms Length Rule - Staff will stay within arms' length while assisting all high fall risk patients, and all others deemed appropriate based on clinical judgment, including while in the bathroom. Explain to the patient that they are at high risk for falling in the bathroom and staff are there for their safety.
 - ◇ Bed Alarm - Turn bed alarm on immediately for all newly admitted or transferred patients. Transportation will place all returning patients on bed alarm, until nurse assesses and determines need for bed alarm. Bed alarm may be discontinued by primary nurse if fall risk assessment deems the alarm unnecessary.
 - ◇ Call Escalation - Escalate every bathroom assistance call for high fall risk patients. Remind patients to "Call, don't fall."

4.3-3 Acute Care Total Fall Rate per 1000 Patient Days



Excludes 5W Oasis and 7A Short Stay.

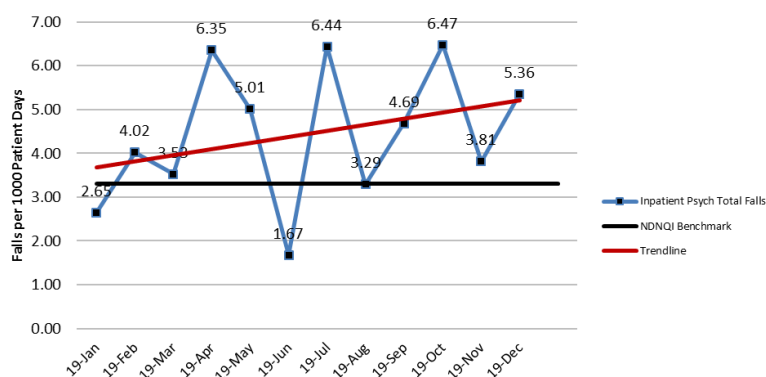
Behavioral Health Division Fall Prevention

Behavioral Health Division saw an increase in falls for 2019 (Figure 4.3-4). Work began in the fall of 2017 on developing the Behavioral Health specific falls prevention intervention bundle. Fall reduction efforts in 2019 were focused on reinforcing the falls prevention bundle, and best practices for preventing falls in patients that fall due to Huntington's Disease. Patients with Huntington's disease are excluded from NDNQI fall reporting unless they sustain a moderate or major injury.

Behavioral Health Division initiatives and work summarized as follows:

- Revived the Behavioral Health Falls Committee.
- Implemented orthostatic vital signs for patients that had antipsychotic medication adjustments.
- Sustainability of fall bundle.
- Prevention of falls in patients with Huntington's disease.

Figure 4.3-4: Inpatient Adult Behavioral Health 2019 Fall Rate



**Excludes falls from a bordered patient with Huntington's Disease

4.4. 2020 Falls Prevention Initiatives and Goals

- Total fall number reduction by 7.5%.
- Sustain current initiatives.
- Assess common factors associated with injury falls to better understand these falls and implement interventions guided by this data.
- For the Acute Care Division, create an individualized falls care plan for patients, validate Hester Davis as an appropriate fall risk assessment scale, revitalize the fall audits tool for fall champions.
- For the Behavioral Health Division, implement the fall audit tool to increase awareness of falls, increase falls committee participation, and sustain best practices for patients with Huntington's disease.
- Formal evaluation and publication of current initiatives.

5. OUTPATIENT SAFETY & QUALITY INITIATIVES

5.1. Ambulatory Care Services (ACS) Quality Improvement (QI) Committee

CHS Director: Simon Hambidge MD, PhD	
CHS Quality Improvement: Ray Estacio MD, Data Support, ACS Data and Analytics, Operations Coordinators	
Asthma: Asthma management in primary care clinics.	Pediatric QI: Pediatric preventative services in primary care.
Diabetes: Diabetes care in outpatient clinics.	Cancer Screening: Colorectal, breast and cervical cancer screening.
Perinatal Care: Perinatal care (prenatal and postpartum care).	Medical Neighborhood: Improving outpatient processes and communication in specialty clinics.
Weight Management: Weight assessment and counseling.	Immunization: Pediatric and adult immunization throughout the enterprise.
CVD: Cardiovascular prevention and treatment in outpatient clinics.	Care Management: Improving care coordination in complex patients.
Anticoagulation: Outpatient anticoagulation services.	ACS Transition of Care (TOC): TOC from inpatient to outpatient.
ACS Pain/Opioid: Outpatient management for chronic pain including monitoring for chronic opioid use.	Tobacco Cessation: Tobacco assessment and cessation for the enterprise.
Integrated Behavioral Health: Depression and anxiety screening management.	Epic Optimization: Prioritization, coordination and implementation of Epic tools to facilitate Quality Improvement.

5.2. Ambulatory Quality Improvement Committee (AQIC)

The Ambulatory QI Committee (AQIC), formally Ambulatory QI and Design Committee (AQIDC), is a multidisciplinary committee which helps monitor QI performance efforts through updates from QI Workgroups and vet potential new processes that would involve ACS clinics (from interventions developed in clinics to research projects to national initiatives). Interventions which will involve DH clinics must be vetted by AQIC to obtain approval. This allows the Committee to evaluate the intervention and determine the potential impact on the clinics.

5.3. ACS Strategic Clinical Performance Metrics

On an annual basis, ACS and Denver Health leadership identify strategic clinical performance metrics which are informed by national key performance indicators. Strategic clinical performance metrics are guided by organizations such as NCQA, HEDIS, Bureau of Primary Healthcare, CMS, and PCMH Recognition. AQIC works with ACS QI workgroups to define targets for these metrics. ACS developed a scoring system, Ambulatory Quality Strategic Index, to monitor progress throughout the year. Figure 5.3-1 shows that Denver Health achieved an Ambulatory Quality Strategic Index Score of 9 points in December 2019 based on performance of the 12 Strategic Indicators. The Target Value for the Index Score was 14. Although there was overall improvement in most of the individual Indicators compared to 2018, DH did not reach the pre-defined Target Values.

Figure 5.3-1: Ambulatory Quality Scorecard Summary December 2019

		Diabetes A1c <9 77%	Diabetes A1c Testing 95%	Hypertension BP Controlled	Breast Cancer Screening 54%	Colorectal Cancer Screening 63%	Persistent Asthma on Controller Meds 5-64 yrs 72%	Depression Screening / Monitoring at Visit 55%	Peds Vaccinations Combo 7 79%	Well Child Check Rate 3-6 year olds 79%	Assessment and Counseling - Peds 72%	First Trimester Entry into Prenatal Care 70%	ACS Tobacco Interventions 56%	Ambulatory Quality Strategic Index 14 pts
CHS Overall	Total	73.98% 10,135	93.74% 10,135	65.13% 23,638	60.2% 14,706	57.73% 26,862	71.96% 4,486	57.65% 6,330	78.78% 3,148	77.6% 13,874	75.87% 46,389	66.96% 4,488	51.32% 4,100	9 pts
	Total	73.98% 10,135	93.74% 10,135	65.13% 23,638	60.2% 14,706	57.73% 26,862	71.96% 4,486	57.65% 6,330	78.78% 3,148	77.6% 13,874	75.78% 46,389	66.96% 4,488	51.32% 4,100	9 pts
Family Medicine Division	Total	73.76% 5,370	94.53% 5,370	64.94% 11,924	60.84% 7,391	57.23% 13,157	72.66% 1,701	59.27% 2,561	77.21% 1,400	76.32% 5,996	72.15% 16,742	68.05% 1,931		
General Internal Medicine Division	Total	74.98% 4,581	94.19% 4,581	64.75% 11,924	60.66% 7,085	59.02% 13,474	66.84% 1,140	61.4% 2,101	75.0% 32	82.82% 163	78.96% 503	21.88% 32		
General Pediatric Division	Total						75.33% 1,301	73.28% 539	80.09% 1,703	78.45% 7,465	81.59% 23,247			
School Health Division	Total						75.67% 300	36.68% 627		79.6% 250	63.85% 5,876			
Womens Care Division	Total				25.22% 230	10.39% 231	52.27% 44	43.03% 502				66.69% 2,525		

In an effort to reach our Target for 2019, improvements to our overall approach to QI were needed. ACS built a system to coordinate the different efforts in one Population Health Strategic Plan that meet the ACS requirements while maximizing current resources. The approach included “during-visit” and “between-visit” strategies which involved input and feedback from ACS leadership, QI workgroups, clinics, ACS Data and Analytics team, and Epic. The goal is to further standardize approaches and guidelines based on a team-based approach. Based on best practices, ACS created guidelines to help define each team member’s standard work along with creating more user-friendly Epic tools to facilitate standard work. The team members for the clinics include patient navigators, clerks, medical assistants, nurses, clinical pharmacists and providers. At the end of the 2019, reports were developed that monitor the utilization of Epic’s alerts to order tests or perform tasks during the clinic visit by medical assistants. These reports will provide feedback to local clinic leadership on performance at the check in process which is a “leading metric”. In 2019, more effort was focused on “between-visit” interventions utilizing central resources to offload the clinics. Utilizing grant funding, a Population Health Team was created to lead efforts in our between visit interventions. The team was composed of a clinical pharmacist and 2 medical assistants. A Health Summary letter was created which will be implemented by end of Q1 of 2020. This letter will be mailed to our patients which will update them on the status of their various indices of care (blood pressure and diabetes control, cancer screening compliance, etc.). This will include recommendations to take action in their gaps in care, such as scheduling a primary care clinic appointment or a mammogram.

Diabetes Control

74% of adult patients in the diabetes registry had a last hemoglobin A1c below 9.0%. This is slightly below the target goal of 77%. DHHA’s diabetes registry has grown by over 300 patients over the past year.

- Efforts are driven by the Diabetes workgroup who developed a multi-pronged approach to improving diabetes management.
- Strategies included provider education of new guidelines, utilization of medical-therapy -management with clinical pharmacist, incorporation of Diabetes Self-Management Classes, nurse insulin titration clinics and outreach efforts.
- Developing outreach efforts to bring patients with uncontrolled metabolic and blood pressure control back to clinic. Our Population Health Team is utilizing our diabetes registry to outreach to patients with a focus on our Medicare patients.

Hypertension Control

65% of patients in the hypertension registry had their most recent blood pressure obtained in ACS in the last 18 months < 140/90 mmHg (age < 80) or < 150/90 mmHg (age ≥ 80). The number of patients in DHHA’s hypertension registry continues to grow every year, our population grew more than 2,000 patients over the past year to approximately 23,600 patients in December 2019. Compared to 2018, there was a slight improvement in blood pressure control by nearly 2%.

- DHHA continues to see seasonal variation in blood pressure control with the best performance in July and August and the lowest performance in January and February.
- Although clinic performance seems to be driven by the percentage of African Americans (lowest control rates), there is also clinic variability within each race/ethnic group. Additionally, newer patients had a tendency of more uncontrolled blood pressures.
- In addition to patient factors (e.g., non-adherence with medication and lifestyle), there appears to be hesitancy for medication intensification, specifically for patients with blood pressures slightly above recommended goals (systolic blood pressures in the low 140’s mmHg).
- Similar to diabetes, outreach efforts to bring patients with uncontrolled blood pressure control back to clinic and with a focus on using our clinical pharmacist resources. Our Population Health Team is utilizing our hypertension registry to outreach to patients with a focus on our Medicare patients.

Breast Cancer Screening

60% of active female patients age 51-74 years old had a mammogram in the past 2 years, which exceeds the target of 54%. The number of patients has increased by nearly 700 patients over the past year. There was a slight improvement compared to 2018.

- The Cancer Screening workgroup lead DH’s efforts for this metric. The focus was improving during visit efforts to order the screening tests.
- During 2019, efforts were hampered by access to mammogram appointments due to staffing issues and availability of the mammovan. We have and continue to work with radiology to improve access which includes a new mammovan.
- The Population Health Team will also outreach to patients who need breast cancer screening with a focus on DHHA’s Medicare patients.

Colorectal Cancer Screening

58% of active adult patients age 51-75 years old had at least one of the following services: Fecal Occult Blood Test (FOBT) in the past 15 months, flexible sigmoidoscopy in the past 5 years or colonoscopy in the past 10 years. The number of patients has increased by greater than 1,400 patients in the past year. Our performance has increased by 2% compared to 2018 but did not reach our threshold goal for 2019.

- The Cancer Screening workgroup led efforts for this metric and identified key issues with the data. Specifically, DHHA needs to appropriately incorporate outside data into our EHR to avoid duplication of work.
- During the fall of 2019, we were able to implement efforts to contact patients who have not returned their FOBT kit. Several clinics showed effectiveness of the interventions.
- Efforts are underway to centralize colon cancer screening which will allow us to mail FOBT kits to patients centrally for appropriate patients.

Persistent Asthma on Controller Medication

72% of patients with persistent asthma, 5-64 years old, are on a controller medication. During the year, we had a steady increase and reached the target goal of 72%. This metric is making sure that patients have an active prescription for a controller medication, most commonly a steroid inhaler.

- The major intervention included reviewing patient diagnosis and making sure that the patient had an appropriate persistent asthma diagnosis.
- Efforts were also focused on making sure that there was an active prescription of a controller medication available for the patient to pick up.

Depression Screening

58% of empaneled patients ≥ 12 years old had a depression screen done at the time of the visit. During the year, compliance improved so that the goal of 55% was achieved.

- The major intervention led by our Integrated Behavioral Health workgroup was making sure there is standard work to implement depression screening but also include anxiety screening by the medical assistants at the time of check-in.
- For 2020, we will include “follow up” for patients with a positive screen for depression.

Pediatric Vaccination (Combo 7)

In 2019, we moved from Combo 10 to Combo 7 to better align with national priorities. This indicator measures the percentage of patients who have received 4 DTaP, 3 Polio, 1 MMR, 3 HIB, 3 Hepatitis B, 1 Varicella, 4 Pneumococcal immunizations, 1 Hepatitis A, 2 or 3 Rotavirus by 24 months of age. By December 2019, we reached a rate of 78.8%, just shy of our 79% target.

- Performance on this metric had a slow steady increase as we developed a strategy for this complicated metric.
- Interventions were focused on educating families with vaccination hesitancy.
- Efforts were made to preschedule patients for 2-4-6 months for their Well Child Checks (WCC) which is when the vaccinations are given. Also some clinics focused on following up on patients who missed an appointment for a WCC.
- Efforts focused on adhering to standard work at the visit and ensuring that the medical assistants use the Best Practice Alerts to facilitate the vaccination process for those who have a clinic visit.

Well Child Check (WCC) Rate 3-6 Year Olds

This metric measured patients 3–6 years old who had one well child check in the measurement year which aligns with a national priority of Medicaid. By December 2019 we reached 77.6% compliance, just shy of our target of 78%.

- Majority of the improvement was demonstrated in the Pediatric clinics with nearly all clinics reaching our Target or Stretch goals.
- A major strategy is to convert acute visits to a WCC visit which is a more complicated visit. This continues to meet some resistance from providers as it prolongs the visit.

Weight Assessment and Counseling for Pediatric Patients.

76% of patients 3– 17 years old had a body mass index measured, along with nutrition and activity counseling in the past year. This exceeded our target goal of 72%.

- During the year, we had a steady increase in this metric. The major focus has been appropriate documentation of the counseling during the visit. This was facilitated by developing a visit template which captures the process.
- Outreach efforts also focused on patients who needed a Well Child Visits.

First Trimester Entry into Prenatal Care

67% of pregnant women who received care at Denver Health during the calendar year had an OB intake date within 13 weeks into their pregnancy. During 2019, we had a slow increase in this metric increasing by only 1.5%, but we did not meet our target goal of 70%.

- The major barriers identified are patients presenting later in their pregnancy and lack of appointment access. This led to efforts following up on patients who missed or no-showed for their appointment and expanding OB appointments in the clinics.
- Another intervention is being able to integrate data for patients who transferred care and the information into the medical record.
- Efforts to integrate these and other QI intervention were focused on creating a new OB template. Unfortunately, due to competing priorities the development of the templates was delayed. The efforts were then focused in Q3 and 4 to help “train” on the use of the templates with a goal to improve the metric in 2020.

Tobacco Intervention

51% of patients ≥ 11 years old who smoke received a cessation intervention at their last visit or within 6 months prior to their visit. We did not meet our target of 56%. Although this indicator did not improve during the year, our prevalence of smoking decreased by 1.5% since 2018, which is a pattern we have seen since implementing a comprehensive strategy over the past years. Denver Health has been cited by the Colorado Department of Health and Environment as a model for smoking cessation.

- The interventions included QuitLine referrals, tobacco cessation clinic referral, counseling, use of tobacco cessation medication, provider counseling and/or referral to a text messaging program.
- During 2019, efforts by the workgroup have been focusing on the Vaping problems which have affected our youth. We hope in 2020, we will have developed a more accurate way to measure the prevalence and also identify interventions that might improve this problem.

5.4. Medical Neighborhood

ACS continued its efforts on the Medical Neighborhood which has improved the referral process to specialty clinics. These efforts have led to Patient Centered Specialty Practice recognition by CMS. After the conclusion of TCPI program in September 2019, efforts were focused towards continuous Quality Improvement. As an example, surgery clinic wanted to focus on a QI project that decreased costs in the clinic. The QI champions in the clinic decided to focus on decreasing supply cost while still providing excellent care for patients. After reviewing the baseline data, the QI team worked on developing an action list to bring to the Surgery Clinic staff meeting. The list included: standard workflow for materials given to patients; increase awareness of item costs (labels); more appropriate use of resources to provide patients with the supplies they need; educate and redirect staff and patient education (tip sheet on costs for over the counter supplies).

6. ACCREDITATION

6.1. Hospital Lab Joint Commission Survey

The Joint Commission Hospital Laboratory unannounced on-site visit occurred from June 4 through June 8, 2019. Denver Health hosted two surveyors for four days for a comprehensive review in accordance with the Clinical Laboratory Improvement Amendments of 1988. The final recommendations for improvements were limited and Denver Health demonstrated high levels of patient safety and quality of care. All recommendations were addressed within 60 days and Denver Health was granted Accreditation for all services surveyed under the Comprehensive Accreditation Manual for Laboratory and Point-of-Care Testing. The accreditation cycle is effective June 8, 2019 and is customarily valid for up to 24 months.

6.2 Ambulatory Joint Commission Survey

The Joint Commission Ambulatory – Community Health Services triannual on-site visit occurred from December 2 through December 6, 2019. Two surveyors arrived for five days to complete a comprehensive review of our ambulatory care services and Primary Care Medical Home. The survey was one of the best surveys at Denver Health in recent years demonstrating the commitment to patient quality and satisfaction of care. The number of recommendations was minimal and all were resolved within 60 days and Accreditation was granted. The accreditation cycle is effective December 6th, 2019 and is customarily valid for 33 to 36 months.

6.3 CDPHE / CMS Surveys

In 2019 DHHA experienced four hospital unannounced licensure surveys from Colorado Department of Public Health and Environment (CDPHE). The June survey focused on patient discharge documentation specifically related to wound care and the findings were corrected with education, audits and Epic enhancements. The focus in September was on Patient Rights and restraint usage and the findings were corrected with Epic reconfiguring the emergency department and inpatient units to one consistent way of viewing and documenting the information in a flowsheet. This sustainable system change improved appropriate documentation. We had two CDHPHE visits in December with no deficiencies cited.

6.4. 27-65 Behavioral Health Survey

The Colorado Office of Behavioral Health (OBH) completed their annual inspection for the Colorado state licensing survey on January 30, 2019. Five surveyors from OBH reviewed reports from staff, completed a visual scan of the facility, reviewed patient records, personnel files and policies and procedures. There were no significant safety findings and a Plan of Action was completed for several violations/recommendations, such as: increase consistency regarding admission summary, place additional surveillance signage on the adolescent units, reduce computer monitor visibility and increase attempts to have clients sign legal documents and treatment plans. Denver Health received Office of Behavioral Health approval of Denver Health's Plan of Action and completed the site review cycle with the continuation of a full 27-65 mental health designation.

6.5. Failure Modes and Effects Analysis (FMEA)

The Department of Patient Safety and Quality (DPSQ) in collaboration with multiple departments (Respiratory Therapy, Pulmonary, Critical Care, Pharmacy, Surgery and Trauma) conducted a FMEA prior to implementation of Extracorporeal Membrane Oxygenation (ECMO). The ECMO project planning began in September 2018 and went live in May of 2019.

Extracorporeal Life Support (ECLS) is indicated for potentially reversible, life-threatening forms of respiratory and/or cardiac failure and are unresponsive to conventional therapy. ECMO is defined as the use of extracorporeal ventilation and circulation cardiopulmonary bypass circuit for temporary life support for patients with potentially reversible cardiac and/or respiratory failure. ECMO provides a mechanism for gas exchange as well as cardiac support thereby allowing for recovery from existing lung and/or cardiac disease. ECMO is an accepted treatment modality for neonatal, pediatric and adult patients with respiratory and/or cardiac failure unresponsive to maximal medical therapy.

FMEA Purpose:

- Proactively identify failure points in the process
- Allow for proactive mitigation
- Safety and Satisfaction for our Patients, Families and Employees

Failure Modes Identified:

- Training and Competency of Staff
- Equipment and Supplies
- Order Sets in Epic
-
- Communication and Handoffs
- Staffing
- Policies, Guidelines and Checklists

Strategies:

- Ensure staff are trained prior to implementation by outside experts from ECMO Advantage
- Creation of inclusion criteria for appropriate patient selection for ECMO treatment
- Orders reviewed prior to providing care
- Proper care of equipment
- Vendor backup availability
- Creation of documentation and requirements
- Communication and education to patient and family
- Standardize communication to employees (checklist, policies, guidelines, etc.)

Indicators/Metrics:

- Monitoring events through Safety Intelligence (SI) occurrence reporting system
- Daily Patient Safety Call Report Out

Outcome:

- While a small number of patients have been treated using ECMO technology, the expertise at Denver Health provides lifesaving technology in cases that are very complex.

6.6. Environment of Care (EOC)

The goal of the Environment of Care (EOC) program is to promote a safe, functional, and supportive environment so that patient safety and quality are preserved. The EOC Joint Commission chapter stresses the importance of identifying and managing the risks in the EOC. The EOC is composed of seven sections:

- **Safety:** Addresses risks in the physical environment, staff safety, construction safety, product recalls, and smoking.
- **Security:** Addresses overall security, access to sensitive areas, response to events, and other issues where staff, visitors, or patients may be at risk.
- **Hazardous Materials and Waste:** Addresses the risks associated with hazardous chemicals, radioactive materials, hazardous energy sources, hazardous medications, and hazardous gases and vapors.
- **Fire and Life Safety:** Addresses risks from fire, smoke, and other products of combustion, fire response plans, fire drills, management of fire detection, alarm, and suppression equipment and systems, and measures to implement during construction or when the Life Safety Code cannot be met.
- **Medical Equipment:** Addresses selection, testing and maintenance of medical equipment and contingencies when equipment fails.
- **Utilities:** Addresses inspection and testing of operating components, control of airborne contaminants, and management of disruptions.
- **Emergency Preparedness:** Addresses how the hospital will respond and sustain during large disasters.

Below are some accomplishments within the EOC program within the calendar year 2019:

- Conducted multiple education trainings for the operating room (OR) which included: fire drill, laser safety training, active shooter training, evacuation training and scenario-based exercises.
- Regulatory compliance consolidation continued within the Support Services Department by the Director of Safety to have central monitoring and escalation. Areas that were deficient were corrected so that Denver Health can continue down the right path and ensure compliance with applicable rules and regulations.
- The Joint Commission Survey for ACS / CHS was completed with no EOC deficiencies identified.
- 21 of the performance indicators/goals were met or exceeded, 14 of the performance indicators/goals were partially met and 6 of the performance indicators/goals were not met.
- Although the Security program did not meet their goal, they did successfully transition the creation of ID badges from Human Resources (HR) to Security without adding a single additional position. After that, they opened a new Badge Printing office in the Administrative building. The Security department moved to a new incident reporting system that improves the ability of officers to enter reports from cell phones in the field, as well as designated computers. The system includes a patrol tracking capability that enables the ability to track security rounds and patrols.
- Risk Assessment conducted on shipping boxes in Food Services area - Removal of outside shipping boxes would increase labor costs for the unpacking and re-sorting of items. Removal would also require Food and Nutrition employees to date/label all individual boxes of items, posing a high risk for error and inconsistencies. Lastly, shipping boxes include manufacture's information that is critical in the event of a food recall and need to be readily available. The committee voted to approve the Risk Assessment that was submitted to allow shipping containers in Food and Nutrition Services storage areas, kitchens, and retail operations (non-patient care).
- After monitoring attendance on EOC rounds for a few years, the group ended the year with 84% attendance, which exceeded the goal of 80% attendance by all required areas.
- Hand hygiene was monitored for several years and finally exceeded the goal of 85% in 2019.
- The Methadone Clinic ended the year with 13 diversions, which exceeded their goal of less than 20 diversions.
- The project of changing out hand hygiene dispensers was completed in early 2019. The hospital dispensers were subsequently replaced with a newer version of the dispenser software which allowed for better performance.
- The Water Management Plan was completed & uploaded into PolicyStat.
- Over 20 Unannounced Patient exercises testing DHHA's "Ask, Isolate, and Call" procedures were completed for every clinic-based department in the nine FQHC's.
- Multiple evacuation trainings using Med-sled were conducted in Pavilions A, B, C and M.
- All Emergency Response policies and procedures included in the DHHA EOP have been uploaded into PolicyStat.
- Over 40 Emergency Preparedness focused trainings were conducted over the 2019 calendar year.

6.7. Emergency Management Program

The objective of the Emergency Management Plan (EMP) is to prepare DHHA for an actual incident in an efficient and effective manner while supporting a continuum of patient services in a safe environment.

Several initiatives were undertaken and continued in Emergency Management in 2019.

- **Emergency Operations Plan (EOP).** Annual updates to the EOPs for the Hospital, Ambulatory Care Services (ACS), and Winter Park Medical Center (WPMC) were completed.
- **Required Emergency Response Real-world Events, Exercises, and Drills.**
 - ◇ ACS – Conducted a total of 19 “Unannounced Patient Drills” at each of the nine CHS clinics, in addition to representing CHS Clinics in two Community-based exercises involving the North Central Regions (NCR) Ancillary Healthcare Committee.
 - ◇ WPMC – Conducted a Mass Casualty Incident (MCI) Table-Top exercise with Grand County Office of Emergency Management, Grand County Public Health Department, Grand County Sheriff’s Department, Grand County Paramedics/Fire, and other local healthcare entities; in addition to responding to a real world surge event involving patients from a motor vehicle accident brought to WPMC.
 - ◇ Denver Health Medical Center (DHMC) met its Regulatory requirements for 2019.
 - DHMC participated in seven Community-based exercises that included three Full-Scale Exercises involving local, state, and federal agencies.
 - DHMC activated the Hospital Incident Command Center (HICS) six times in 2019 in order to respond to real-world events that impacted the facility and/or patient care.

6.8. Continual Readiness for 2020 Joint Commission Survey

Denver Health promotes Continual Readiness for all State, Federal and Voluntary surveyors, however right before our TJC triannual visit we always need to evaluate our processes. In April 2019, Patton Consultants evaluated DHHA’s readiness and compliance with The Joint Commission standards. Three surveyors (a physician, a nurse and a life safety coordinator) stayed for 3 days and highlighted areas of opportunity for improvement. Based on their recommendations and findings, six teams were created to work: High Level Disinfection (HLD), Suicide Safety, Environment of Care (EOC), Departmental and Organizational Competencies, Medication Management Safety, Nursing Standards.

High Level Disinfection was evaluated and it was determined that multiple areas performing the same service was inefficient. Thus, one HLD service center was created in PAV A.

Suicide Safety is one of the leading causes of death in the country and is on the rise. TJC has mandated new Suicide standards effective in July 2019. The Suicide Taskforce led by Stephanie Peer, RN has successfully implemented and enhanced the process of suicide screening, education of nursing and patient safety care attendants (PSCA) and documentation demonstrating our dedication to safe patient care.

As DHHA approaches 160 years in serving the community, there are many opportunities to give our environment a face lift. Engineering, environmental services, safety teams and security are working together to ensure that our patients, families and visitors remain safe while receiving care.

Human Resources, clinical and non-clinical departments reviewed all staff personnel files to ensure that everyone has the most updated and current licenses, certifications and education required to perform their job with confidence and ability. In addition, over the past several months staff have heard the battle cry of “2 patient identifiers” every patient, every time! This is incredibly important to ensure the safety of our patients. Imagine being told that your child may have leukemia due to a mislabeled lab specimen or that you have HIV because the wrong results were documented in your medical record. New posters were created and were distributed to every department.

The Continual Readiness Steering Committee, consisting of Joint Commission Chapter Leaders, continued to meet monthly to ensure all standards were met. The Continual Readiness Task Force, which consists of mid to executive level leadership, assisted with addressing any challenges or barriers in meeting required regulations. As a learning organization we will never stay satisfied with the status quo and will continue to strive towards excellence and best practices.

7. CLINICAL DOCUMENTATION INTEGRITY (CDI) QUALITY INITIATIVES

7.1. Patient Safety Indicators (PSIs) & Hospital Acquired Conditions (HACs)

The CDI team reviews the Agency for Healthcare Research and Quality (AHRQ) Patient Safety Indicators (PSIs) and select Centers for Medicare and Medicaid Services (CMS) Hospital Acquired Conditions (HACs) for coding and documentation accuracy. The medical record is reviewed to determine if the documentation supports the code assignment that triggered the safety or quality indicator.

The PSI algorithms are updated periodically by AHRQ. The HACs are published annually by CMS. These PSI outcomes affect quality scores and are used to compare hospitals. These cases also affect payments because these outcomes are included in some pay-for-performance programs. The coded HACs impact payment as part of the Deficit Reduction Act Hospital Acquired Conditions Payment Provision. It is important to ensure that the PSI and HACs are accurately reported.

Once the record is coded, it triggers a PSI or HAC if it meets inclusion criteria per the protocol and does not meet one of the exclusion criteria. The CDI team is notified that the PSIs and HACs were triggered after coded data is run through the AHRQ and CMS algorithms. The record populates to the work list that a Clinical Documentation Integrity (CDI) member checks weekly. We review each record to determine if the code(s) that triggered the PSI or HAC are accurately assigned given the existing documentation and clinical criteria in the record. It is also determined if the patient has any potential exclusion criteria and that codes for those conditions have been assigned correctly. If there is ambiguous or conflicting documentation, a recommendation is sent to coding to send a compliant query to the provider for clarification. If potential coding issues are identified, a coding review is requested. If a coding error or query opportunity is identified and documentation is correctly updated, it is possible to avert the PSI or HAC.

All reviewed cases are entered into a SharePoint audit tool and electronic communication is sent to the Coding Educator if there is a request for a coding review or provider query.

A surgical provider who collaborates with CDI does a secondary review of all PSIs to determine if the documentation by the providers supported the coding of the PSI. This surgeon also educates providers as needed regarding documentation accuracy.

PSI and HAC cases are compared to reported cases in the Vizient Database on a monthly basis to ensure that case reporting is accurate and averted cases have not been incorrectly reported.

Results

The CDI team averted 27% of PSIs and 28% of HACs. Some cases had coding opportunities. Others required a query to the physician when the documentation conflicted the clinical findings or when a condition could be clarified as possibly or definitely being present on admission (POA), thereby averting the PSI or HAC.

Future

The CDI team will continue to review the PSIs and HACs to ensure that the reporting of these conditions is accurate.

7.2. Mortality

The Clinical Documentation Integrity team reviews all Inpatient deaths with an admission severity of illness (SOI) and/or risk of mortality (ROM) score of less than "extreme". The goal is to determine if there are documentation and coding opportunities that would more accurately reflect the patient's admission SOI/ROM or Vizient mortality risk adjustment calculation.

Mortality ratios allow for a comparison of patients' actual mortality rates to expected mortality rates, based on the risk adjusted mortality score. Risk adjusted expected mortality scores are impacted mainly by acute and chronic conditions that are present on admission and have been shown to have a statistically significant impact on mortality.

Risk Adjusted Mortality Ratio = # of observed mortality cases/sum of the expected mortality calculation

Observed mortality is the actual number of inpatient deaths that occur in the hospital during a specific period.

Expected mortality is the predicted number of deaths the hospital will have based on the patient population's risk adjusted mortality calculation.

The APR-DRG Grouper is a proprietary system developed by 3M Health Information Systems. The APR-DRG Grouper assigns an SOI and ROM for each patient. The admission SOI and ROM is determined by the complexity of acute and chronic illnesses present at the time of admission.

Cases were selected that will be reviewed based on the admission SOI/ROM. Prioritizing reviews based on the SOI/ROM allows for timely review selection. The discharge SOI/ROM is readily available to the team after the record is coded.

The Clinical Documentation Integrity Specialists (CDISs) use an Epic work queue to review mortality cases with an admission SOI or ROM of less than “extreme.” These cases have already been coded and we review the accounts prior to claim submission. The CDISs also review the Office of Decedent Affairs death log on a monthly basis to ensure that all admissions meeting criteria have been reviewed. The CDISs review cases and determine if there are coding and documentation opportunities, taking into account specifically SOI/ROM opportunities and risk adjustment opportunities. If any cases were not reviewed pre-bill for SOI/ROM, they are reviewed post-bill and the claim is resubmitted if any coding changes are made. Reviews are tracked in Epic and discrete review data is also entered in a secure Microsoft Share-Point audit tool. If documentation or coding issues are identified, the case is sent to the Coding Reviewer to independently review the record. If a query is required due to inconsistent or incomplete documentation, the Coding Reviewer or CDIS in some circumstances sends a query to the provider. If a coding error is identified during the coding review, the Coding Reviewer recodes the account. After the coding review is complete, the account is re-routed to CDIS to reconcile.

Results

80 accounts were reviewed in 2019 for mortality. 32 of the accounts were sent to coding for review.

Future

The CDISs will continue to review all IP deaths that are not already in the ‘extreme’ category. Along with the current review process, the CDISs will continue to provide education to providers regarding documentation opportunities that will impact accurate reporting of patients’ SOI, ROM and risk profiles.

7.3. Outpatient CDI

The CDI’s outpatient program is in its third year and projected to be in all outpatient clinics in 2020. There was an expansion to the program at the end of Quarter 4 2019 with the addition of 1.0 FTE Clinical Documentation Integrity Specialist (CDIS) RN added to the program.

Using data supplied by Population Health, we focused on chronic conditions that map to a Hierarchical Condition Category (HCCs) that were captured in the year prior (2018) that have not been captured in the current calendar year (2019). If CDIS identify a chronic diagnosis that had not been captured for 2018 and the diagnosis will affect the risk adjustment of that patient, the provider would be queried on day prior to the scheduled appointment. If the diagnosis is documented, CDIS track the coding to verify capture. Once captured, the associated risk adjustment factor (RAF) is calculated (Figure 7.3-1) and added to the patients overall risk adjustment score.

Current Clinic CDIS Reviews:

- *Eastside Clinic*
- *Geriatric Clinic*
- *Infectious Disease Clinic (Pav H)*
- *Intensive Outpatient Clinic*
- *La Casa Clinic*
- *Webb Adult Clinic (Pav G)*
- *Westside Clinic*
- *Westwood Clinic*
-

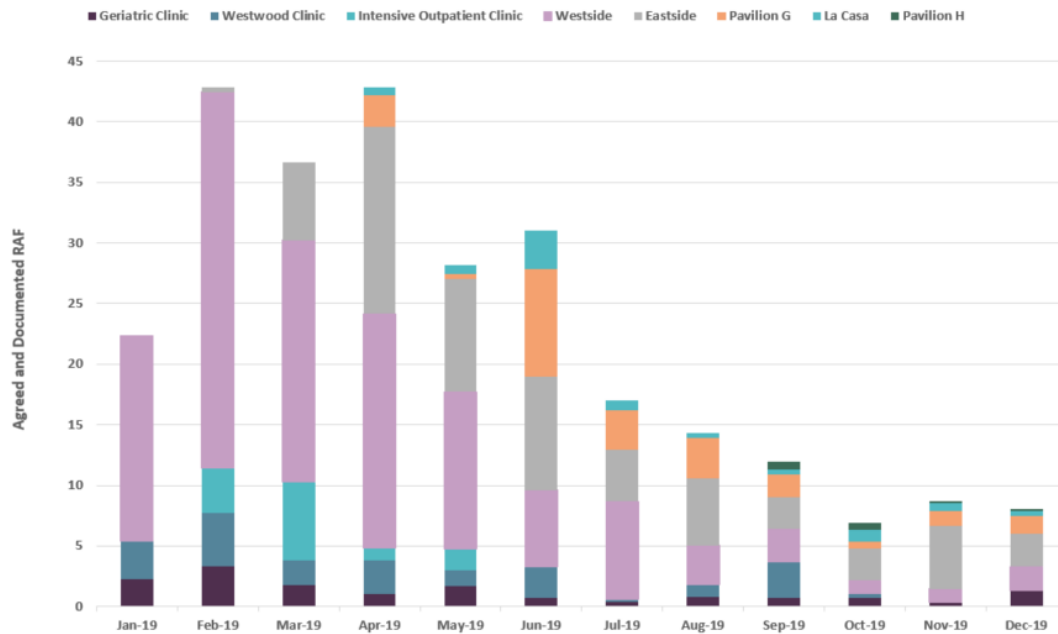
2019 Results:

- **Total RAF gained from CDI answered queries: 270.915**
- **Average increase in RAF per patient reviewed by CDI : 0.30**

Future

Quarter 1, 2020 clinic CDIS reviews are projected to be in Lowry, Park Hill and Pena Clinics During quarter 2 2020, the reviews will focus on the Montebello Clinic

Figure 7.3-1: DHHA Total RAF Added that were Agreed and Documented

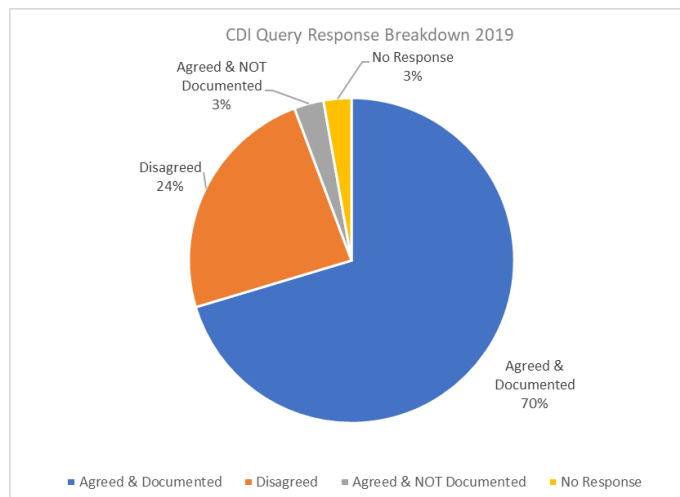


7.4. Concurrent Reviews

CDIs General WQ (008) includes ALL inpatient’s currently in the hospital. The purpose of the WQ is to track the concurrent reviews and queries completed by a CDIS. The purpose of the review is to optimize the physician documentation in the record before it goes to the coder so that the record is accurate, clear, and concise by the time of discharge. CDIS’s use a number of different risk models to determine diagnoses that affect the overall severity of illness (SOI) and risk of mortality (ROM) of each patient we review. We use the 3M software to enter in our choice for principal diagnosis, appropriate secondary diagnoses, and procedures performed to get a final “working DRG” with associated SOI and ROM. Our reviews, queries and “working DRG” are visible to the coders. In 2019, we continued to strengthen the workflow between CDI and the coding department of DRG mismatches. If there is a mismatch that isn’t easily explained, it is routed to the coding educator via WQ 1614 to review prior to final bill. If a case is completed by the coder that is a mismatch, and CDIS does not agree with the final coding, CDIS’s are able to send them to WQ 1614 for the coding educator to review.

In 2019, our team reviewed 5852 records and generated 1768 queries to providers. Out of the 1768 queries sent, 1244 queries were answered positively and documented appropriately. The remaining queries were a mix of no response, disagree, and, agreed and not documented in the record (Figure 7.4-1).

Figure 7.4-1: CDI Query Response Breakdown 2019



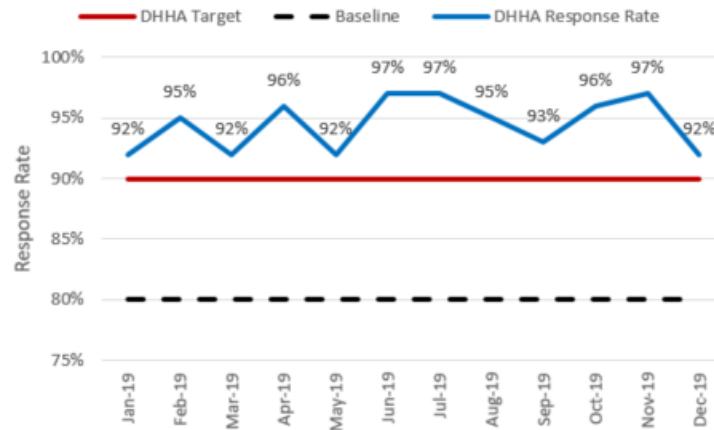
7.5. Query Response Rates

Additionally, monthly, the CDIS track the physician response rate to clarify documentation (Figure 7.4-2). The target was set at 90% for 2019, and we were able to surpass and maintain that rate.

Future

For 2020, we are targeting a 95% query response rate.

Figure 7.4-2: Physician Query Response Rate



DH CDI - CODING REVIEW (WQ 1614)

This is the work queue that was created in collaboration with the coding department. After coding reviews cases that CDI has sent for further review, coding sends the account back to CDI for CDI to close out. CDI is able to close the account or send it on for a second level review by our coding auditor.

CDI Patient Accounts No Longer Open with Active CDI Review (050)

Once a patient is discharged from an inpatient stay and also had a CDI review done in in the General WQ 008. Once on this list, the CDI will follow up through discharge to compare our DRG with the coders DRG. If there are coding errors or issues, we can follow up with a note that routes the account to the coding auditor via our CDI/Coding Review WQ 1614 as our established means of communication.

8. CULTURE OF PATIENT SAFETY

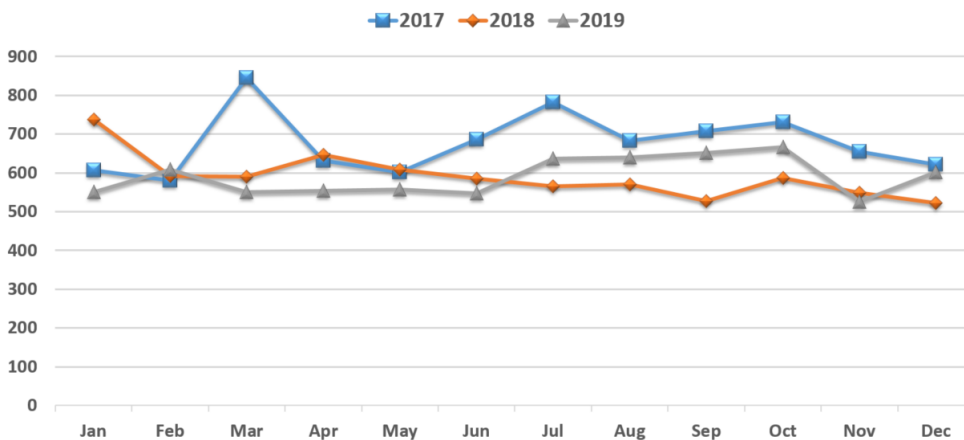
8.1. Safety Intelligence (SI) Reporting

Safety Intelligence is DHHA's incident reporting system. All employees, residents and students can access the system through the intranet and may anonymously report on safety issues. Reporting safety events is everyone's responsibility to proactively identify system concerns in order to implement process improvements. Comparing 2018 to 2019, Denver Health entered incidents remain consistent with approximately 600 to 700 incidents reported monthly (Figure 8.1-1).

Throughout the country workplace violence is increasing in healthcare settings. Denver Health has a robust Workplace Violence Committee and in 2019 the BROSET screening tool was implemented into Epic. This preventative screening tool identifies individuals so that a behavioral health provider can come to a unit to speak with an individual before his or her behavior escalates.

Medication related events were the second most reported event type in 2019. Denver Health has implemented bar code scanning of all medications and in 2019 reports were created that shows the compliance with bar scanning of medications. With ongoing education, coaching, and unit-level data, we anticipate better adherence and ongoing safety in medication prescribing and administration.

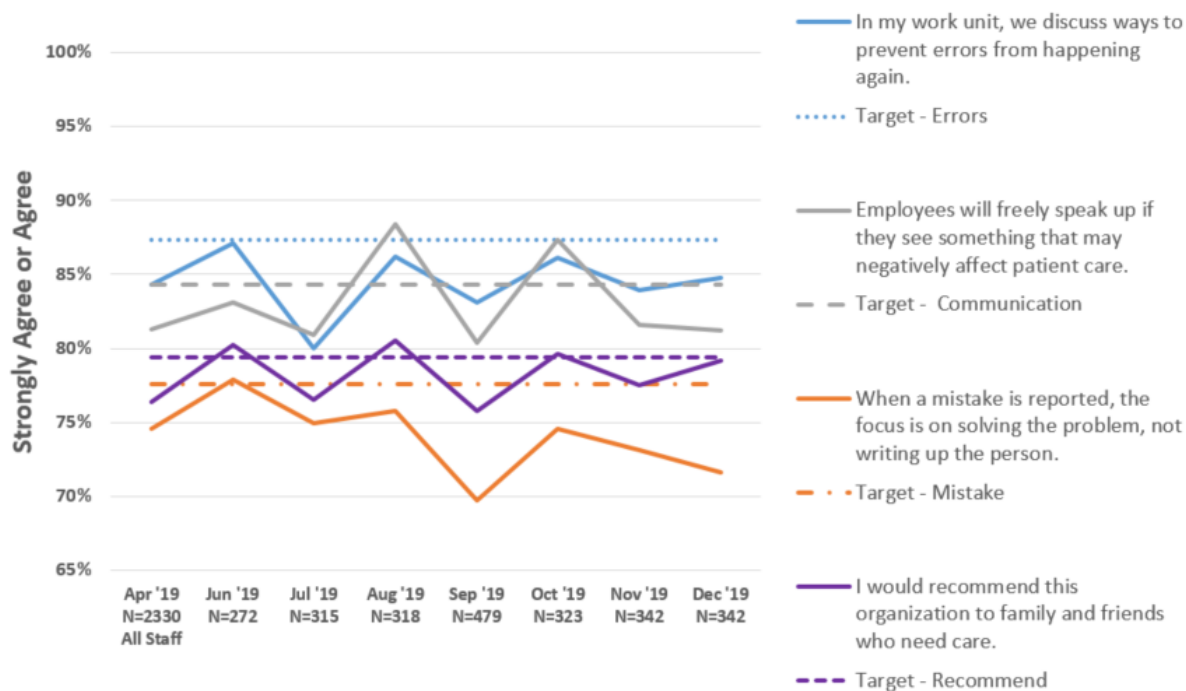
8.1-1: Safety Intelligence Events by Month—All Locations



8.2. Monthly Culture of Safety Survey

In 2019 the Department of Patient Safety and Quality (DPSQ) continued to monitor the pulse of Denver Health’s culture of safety. Employee issues are identified, closely monitored, and if necessary addressed quickly. Four questions were selected for pulse surveys of a random sample of employees every month. The monthly data are shown in Figure 8.2-1. Two out of the 4 measures show some variability throughout the year and 2 measures struggled to meet the predetermined target of those responding with an Agree or Strongly Agree. These measures tend to fluctuate based on competing priorities and resources in the organization. For example, DH opened several new outpatient clinics, started intense planning to open the Outpatient Medical Center (OMC) and prepared for upcoming accreditation surveys. The DPSQ staff continues to educate all new nursing employees on Just Culture and being a learning institution. Cornerstone orientation requirements for all new employees has tended to focus on clinical scenarios and in 2020 the orientation will be updated to depict non-punitive scenarios for non-clinical departments.

Figure 8.2-1: DHHA Culture of Safety Monthly Survey, % Reporting Strongly Agree or Agree



8.3. Culture of Safety Decision Tree

In 2016, the revised Culture of Safety Decision Tree tool (Figures 8.3-1 and 8.3-2) was presented to managers at DHHA. Since then, the tool has been distributed as part of the 2016 and 2017 annual reports and the pulse culture of safety results distributed to leaders in 2017, 2018, and 2019. The tool is also referenced periodically during the daily patient safety briefing.

Figure 8.3-1: DHHA Culture of Safety Decision Tree



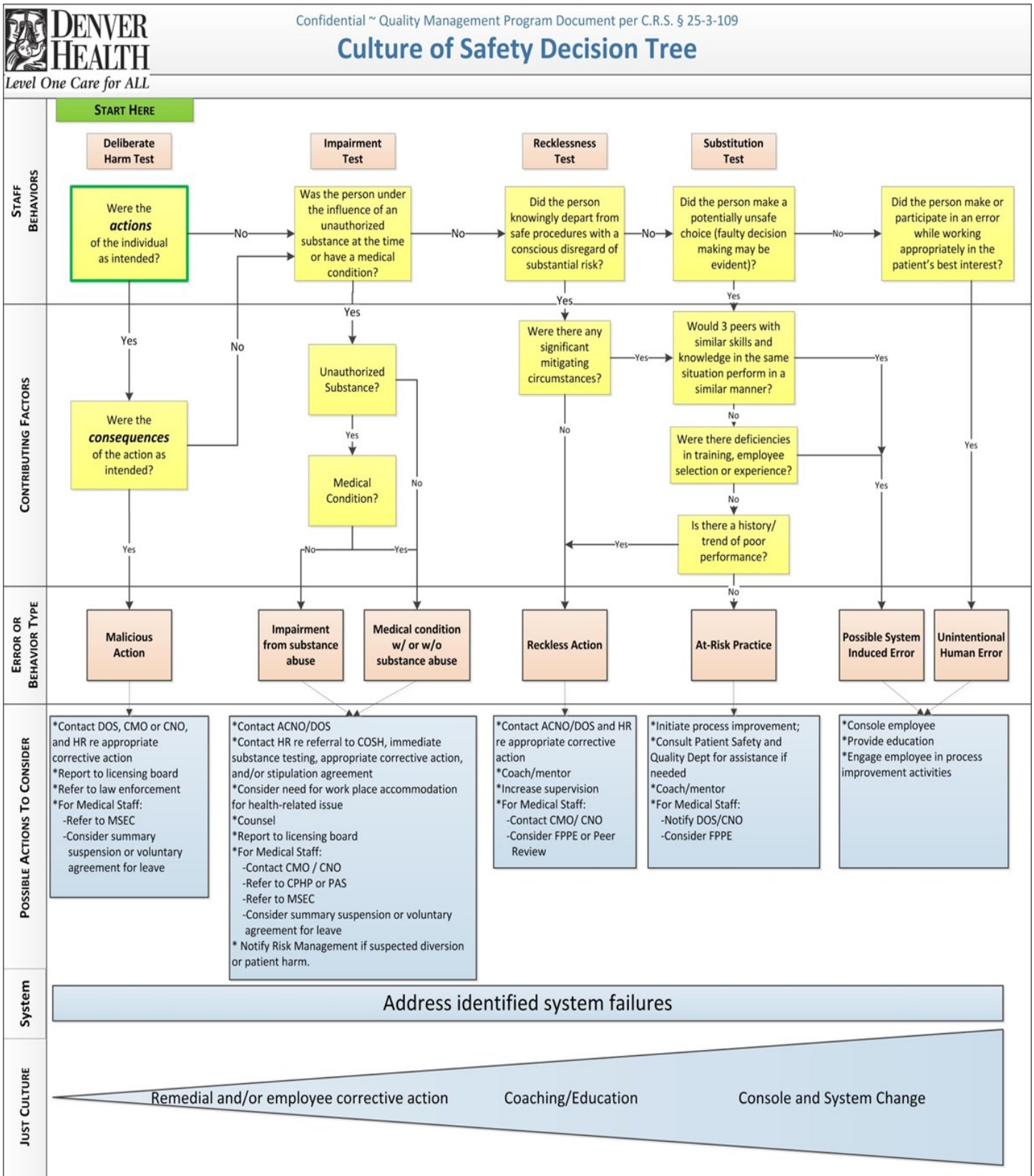
What is a Culture of Safety	<ul style="list-style-type: none"> ▪ Balances the need for an open and honest reporting environment with appropriate individual <u>and</u> organizational accountability to our patients and to each other. ▪ Improves patient safety by empowering employees to actively monitor and participate in safety efforts.
When To Use This Decision Tree	<ul style="list-style-type: none"> ▪ Utilize prior to issuing corrective action following an adverse event or near miss. ▪ Use in addition to and not in replace of the Safety Intelligence reporting system.
Purpose Of This Decision Tree	<ul style="list-style-type: none"> ▪ A tool for leaders to evaluate employee conduct and determine appropriate follow-up action after an adverse event or near miss. ▪ Encourages leaders to decrease the focus on individual blame and instead view an adverse event or near miss as an opportunity to console and re-educate staff, improve systems, and reduce risk.
How To Use This Decision Tree	<ul style="list-style-type: none"> ▪ First: thoroughly investigate the adverse event or near miss. Ensure that a Safety Intelligence report has been filed. ▪ Second: start at the top left of the tool, answer each question 'yes' or 'no,' and follow the arrows through the Decision Tree. ▪ Third: ensure any corrective action is based upon the employee's behavior, not the outcome of the behavior (e.g., harm to a patient). ▪ Fourth: Enter corrective action plan into Safety Intelligence manager review

Tips for Leaders	
	<ol style="list-style-type: none"> 1. We expect the vast majority of cases will result in an outcome requiring managers to console the employee and look for system improvements or re-education opportunities and will <u>not</u> result in employee corrective action. 2. A Culture of Safety encourages transparency. Share the steps you took to investigate and determine the action with the employee. 3. When necessary, seek a second opinion from a fellow leader and/or HR. 4. Contact HR when you are unsure of appropriate corrective action or are considering suspension, decision making leave, or termination.

Rev. 24May2016

Source: DHHA DPSQ

Figure 8.3-2: DHHA Culture of Safety Decision Tree



Source: DHHA DPSQ

9. PATIENT EXPERIENCE

9.1. Voice of the Customer

The Patient Experience department uses a variety of methods to listen to and integrate the Voice of the Customer (VOC) to retrieve immediate and actionable feedback in an ongoing effort to drive our patient experience improvement efforts based on patient and customer input. Information gathered from various listening methods is used to hone in on feedback about the care and services provided. This information is used to make process improvements and identify opportunities for innovative change. The various listening approaches used for our patient and community customers are indicated in Figure 9.1-1.

Figure 9.1-1: DHHA’s Methods for Obtaining Patient Feedback

Patient Listening Method	IP	OP	ED	Comm
HCAHPS/CAHPS/Press Ganey surveys	X	X	X	
Rounding	X	X	X	
AIDET	X	X	X	X
Focus groups	X	X	X	X
Social media	X	X	X	X
Music/pet therapy visits	X		X	
Service Recovery	X	X	X	X
Patient Advocates	X	X	X	X
Pre-admission phone calls		X		
Post-discharge phone calls	X	X		
Community health educational events	X	X		X
Reach Out and Read	X	X		
Patient Family Advisory Council (PFAC)	X	X	X	
Foundation programs	X	X	X	
Advisory/governance bodies	X	X	X	X
DHHA and Patient Experience websites	X	X	X	X
Support groups	X	X	X	
24/7 nurse hotline		X		X
Complaint submissions	X	X	X	
Affiliate hospital boards	X	X	X	
Lean event participation	X	X	X	X
Leadership Development Institute (LDI)	X	X	X	
MyChart patient health portal	X	X	X	

*IP = Inpatient; OP = Outpatient; ED = Emergency Department; Comm = Community

Denver Health uses a variety of integrated learning processes to respond to the VOC throughout the various stages of a patient’s relationship with DHHA. Through highly successful patient-centered engagement methods, such as the Patient Family Advisory Council (PFAC), DHHA has expanded its approach to include new councils that segment patient populations representative of specific units and clinics. This allows DHHA to gain valuable VOC insight and actionable information from council members, enabling DHHA to make improvements based on ongoing feedback provided by patients representing a specific area. In addition to the various councils, DHHA patients are rounded on during their stay and asked specific questions related to their care and experience. Rounds are documented through a program called My-Rounding, which allows DHHA to track data and address issues with the appropriate supervisors and/or departments and directly communicate with patients to resolve the problems. DHHA reaches out to patients after their visit as well, through emails, phone calls, surveys, and MyChart.

The various listening mechanisms used to seek actionable feedback from the VOC allows DHHA to identify patient and community needs, as well as opportunities for process improvement, strategic planning, and innovation. Feedback and insights from the VOC are communicated to DHHA leadership teams and incorporated into strategic goals and action plans for immediate change.

Strategic planning incorporates VOC using a framework that includes a dimension dedicated to the patient experience. Liaised through the Chief Experience Officer, patient experience data is analyzed with plans created that focus on gaps within the patient experience. Multi-year goals specific to patient experience have been established and annual action plans created to ensure movement toward these goals. All patient experience goals established inside of strategic planning are monitored by senior leaders.

9.2. Patient Family Advisory Council (PFAC)

DHHA regularly hosts a PFAC to bring together patient and family advisers to foster a culture of patient- and family-centered care. The council consists of former and current patients, volunteers, employees, as well as non-DHHA patients. The PFAC is facilitated by an elected volunteer chair, the Patient Experience department, DHHA senior leaders, and clinical and non-clinical managers. Council objectives include the sharing of ideas in the implementation of new and existing programs across the enterprise, and identifying and articulating the patient and family perspective with regard to improving the patient experience. The council serves as a collaborative partner in strengthening the standard of excellence in the delivery of safe, comprehensive, and compassionate health care at DHHA. The PFAC provides DHHA with a VOC that allows DHHA to make immediate improvements or innovative changes to meet the needs of DHHA customers and improve the patient experience in all aspects of care delivery. DHHA has made improvements and introduced new programs through the work and input of the PFAC. As a result of its success, DHHA has expanded the program to create new councils that segment the patient population to include those who represent a specific unit or clinic, most recently the Neonatal Intensive Care Unit (NICU) PFAC.

9.3. Patient Advocates

DHHA patient advocates meet with patients daily to help advocate for patients' rights and needs. Patient advocates identify opportunities for improvement and innovations to improve the patient experience, assist caregivers in meeting patient needs and expectations, educate staff on how to provide the best customer service possible, and serve as a resource for both patients and health care providers. Through the VOC, patient advocates have been able to implement change and improve communication with staff, patients, and family members.

9.4. Complaint Management

DHHA has implemented a complaint management system and process that is used across all DHHA inpatient and outpatient areas and clinics. Patient advocates respond to all grievances within three days and review, investigate, and resolve each patient grievance within seven business days, ensuring that the patient is satisfied with the progress and end result. All grievances submitted through the DHHA Web portal are immediately acknowledged. Through our grievance process and patient interactions and feedback, we have been able to make process improvements to enhance the patient experience and our ability to serve our patients. Data from the system is reviewed regularly and shared with various departments/clinics/units.

9.5. Patient Rounding

To ensure that DHHA is listening to the VOC, DHHA utilizes a number of rounding methods with patients and customers, which consist of leader rounding and hourly rounding on patients, and leader rounding on employees and customers. DHHA leaders round on patients daily, to listen to and interact with patients about their experience at DHHA. Rounding has given DHHA an opportunity to learn from patients and customers, improving processes and services through the VOC. Through MyRounding, units and clinics document patient rounds in a systematic way that allows DHHA to track issues and rounding percentages by unit, with a minimum documented goal of 75 percent of patients being rounded on by a leader. DHHA then comparatively tracks responses in the Press Ganey survey that asks patients whether a leader rounded on them during their visit. Starting in 2019, we created an innovative predictive analytics model to generate a list of patients who are rounded on by Clinical and Administrative Senior Leadership. This program operates 352 days a year. This ensures that goals are being met and patients are being visited and heard on a regular basis.

Steps are being taken to build meaningful relationships with patients and customers at each interaction by improving overall communication with patients, family members, visitors, and each other. A single example of this is the now widespread use of Acknowledge, Introduce, Duration, Explanation, Thank You (AIDET) communication – a standard introduction that employees are expected to use at each encounter with patients, visitors, and coworkers. Through our AIDET communication and daily interaction with patients, we are able to solicit feedback from patients and family members that enables us to improve our service and the patient experience. As we connect with our patients, we build and manage relationships that provide us with a forum for change.

9.6. Service Recovery

DHHA designed and implemented a Service Recovery (SR) program to provide employees with a channel for identifying and acting

upon opportunities for improvement in the customer experience. The SR program provides staff members with resources, education, and strategies that allow employees to be owners of service recovery and provide timely and effective methods to correct any breakdowns in service and restore the relationship with the customer who experienced the service failure. Service issues are logged and tracked so that DHHA can correct the issues as they arise, and prevent similar breakdowns from occurring in the future. Issues are categorized and tracked by unit and/or clinic. Trends are identified and addressed at the appropriate level where a simple and flexible tier-based system is used to provide the right intervention for each customer.

Through consistent patient hourly and leader rounding, there is no delay in providing service recovery to our patients and families, as dissatisfaction is immediately brought to the front line where staff can address and resolve customer complaints. This approach is highly engaging for our patients and prevents the accumulation of complaints and grievances that can be costly and negatively impact our relationships with our patients in the long term. With this system in place, we are able to build relationships with our patients and family members, which improves their experiences while in our care.

9.7. Measuring Patient Satisfaction

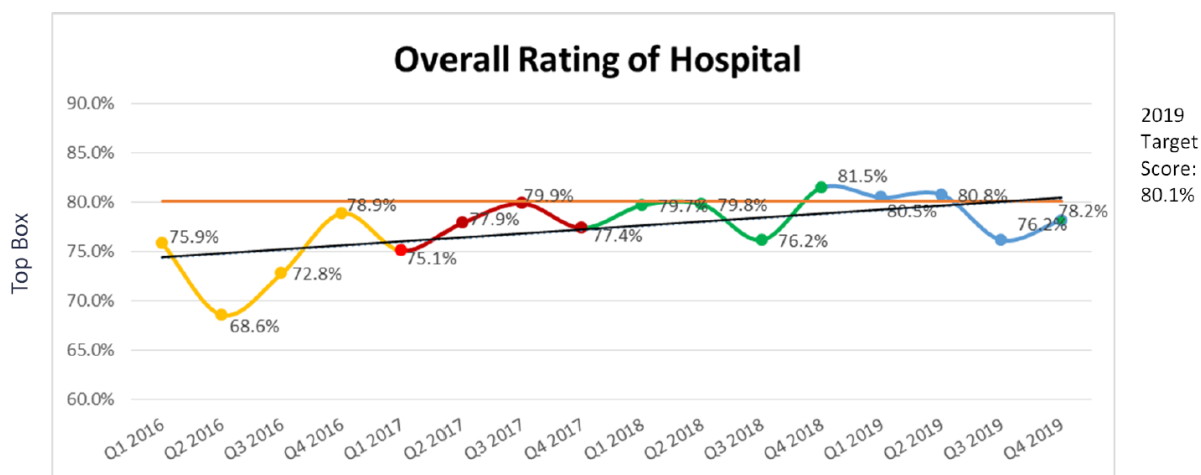
DHHA primarily uses nationally administered surveys to determine patient satisfaction and engagement. We work with a third-party company (Press Ganey) who administers the surveys by telephone, mail, email and text messaging. Press Ganey is an approved CMS vendor that administers the surveys, and provides detailed reports and data which allows DHHA to continuously drive quality improvement. The surveys combine nationally required HCAHPS questions with patient-centered questions to provide the most comprehensive view of the overall patient experience. All departments are responsible for monitoring and posting scores on their communication boards, as well as addressing departmental concerns or issues during staff meetings and daily huddle meetings. DHHA units prioritize, track trends, and implement change through data, patient feedback and comments, and survey reports. Over the past five years DHHA has tracked the Overall Rating metrics at an institutional level. (Figures 9.7-1 - 9.7-3).

DHHA utilizes monthly priority reports generated from Press Ganey survey responses, which are specific to each unit, clinic, or area to determine the highest levels of dissatisfaction. The reports allow DHHA to directly address the issues that have the highest correlation to the overall provider or hospital rating in an effort to improve service and resolve dissatisfaction at all levels.

Additionally, DHHA hosts community forums, Town Hall meetings, focus groups, Patient Family Advisory Council (PFAC) meetings, as well as employee and physician engagement surveys to determine satisfaction and engagement by customer type and segment, and to ensure that initiatives meet the needs of stakeholders.

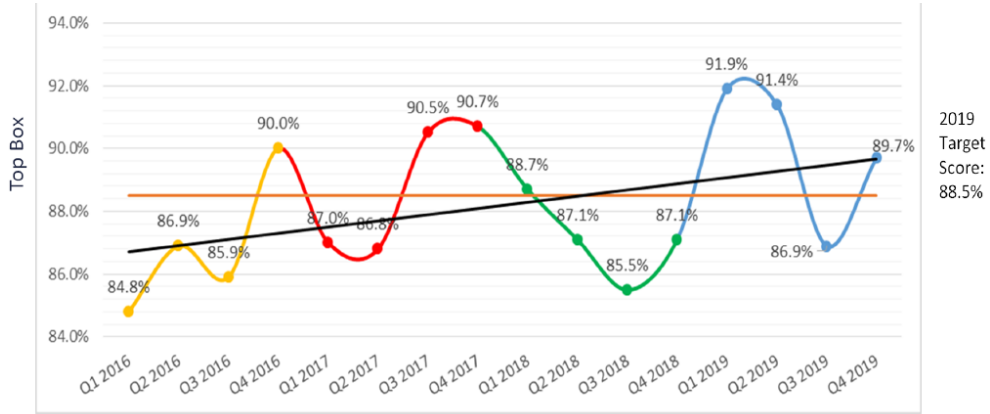
Furthermore, DHHA is continuing its research into patient experience based on clinical and social determinants of health that is not only advancing our knowledge in this area but also directly benefiting patients by integrating these findings into our improvement work and operations.

Figure 9.7-1: Overall Rating of Hospital



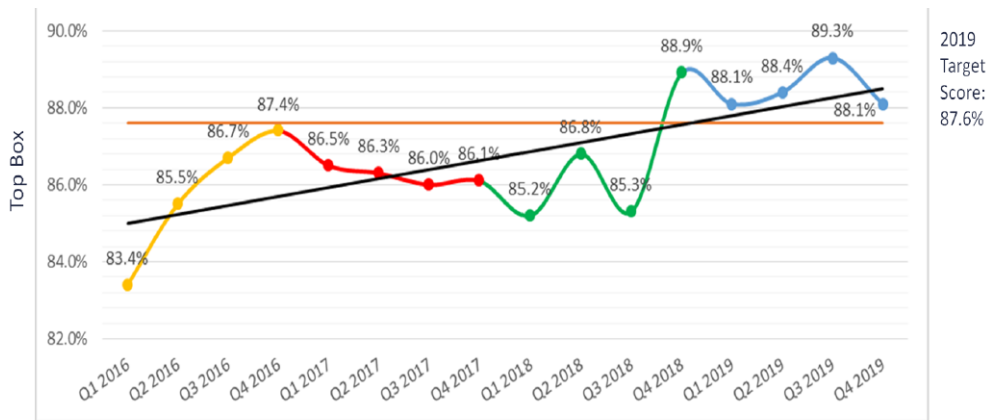
Source: Press Ganey

Figure 9.7-2: Doctor Courtesy and Respect—Hospital



Source: Press Ganey

Figure 9.7-3: Nurse Courtesy and Respect—Hospital



Source: Press Ganey

10. INFECTION PREVENTION

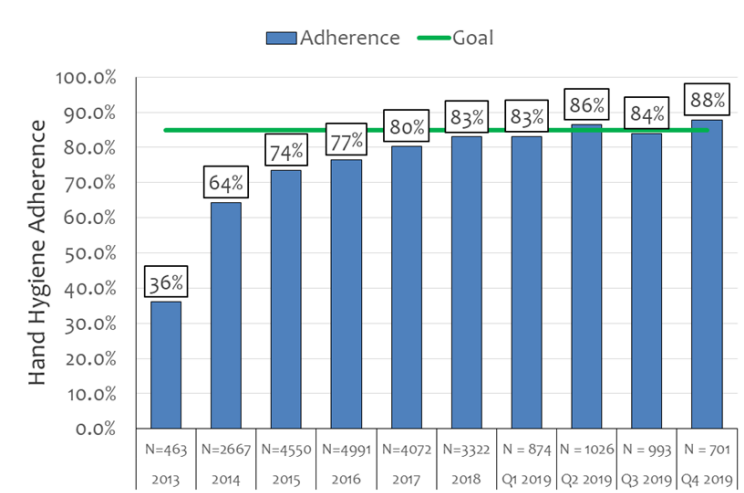
10.1. Hand Hygiene Adherence

Denver Health utilizes the WHO's 5 Moments of Hand Hygiene methodology to determine the facility's hand hygiene (HH) adherence rate. DHHA monitors HH through both manual (inpatient and outpatient settings) and electronic (inpatient, B pavilion) observations.

Manual hand hygiene observations:

Manual observations are collected by Infection Preventionists (IPs), inpatient managers, and hospital leadership. Each unit's leadership was expected to observe a minimum of 15 observations each month and submit the data to IP using a smart phone application. The data was used to determine the monthly and quarterly HH rates. The organizational goal for hand hygiene in 2019 was 85% (Figure 10.1-1).

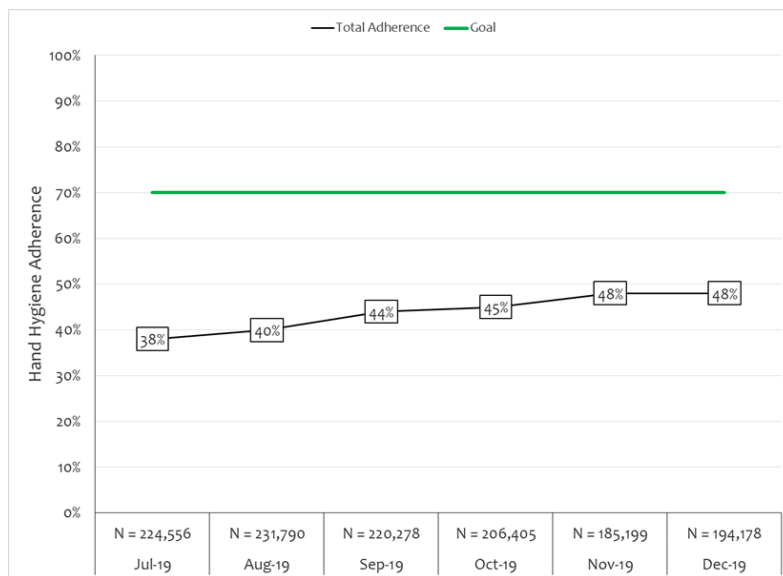
Figure 10.1-1: DHHA Hand Hygiene Rates 2013—2019, Inpatient Locations



Electronic hand hygiene observations:

A funding request was approved to fully fund the system in the existing units and expand to two additional units (8A and SICU) in 2019. This system went live in late 2019. Baseline data collection was conducted, and we spent the rest of 2019 largely focused on ensuring the system is accurately recording observations (Figure 10.1-2) and performing data cleaning operations on the staff roster in the eHH system. We look forward to renewing our efforts to disseminate individual-level electronic HH data to frontline healthcare workers.

Figure 10.1-2: DHHA Hand Hygiene Rates, Electronic Observation, Pavilion

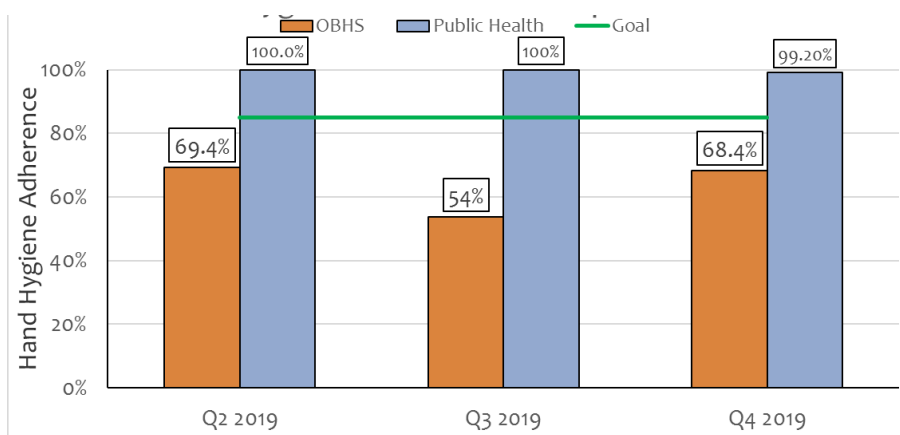


Outpatient Hand Hygiene Surveillance:

During 2018, the ACS Float Team began collecting HH observations at ACS outpatient clinics, providing an aggregate HH adherence percentage; this data collection continued in 2019. During 2018, 174 observations were collected and the overall hand hygiene rate was 79%. In 2019, 880 observations were collected and the overall hand hygiene rate was 87%. Data were not available for all of 2019, but as more data are collected, IP will begin looking for trends in the data to assess performance over time.

Public Health and OBHS: Hand hygiene adherence is also monitored in the public health clinical and outpatient behavioral health services (OBHS) settings (Figure 10.1-3). In OBHS, Infection Prevention established a HH Champion Program and continued it through 2019. Each month, champions collect 40 observations which occurred during medication administration. In the public health clinic setting, leadership collect observations via mobile phone application and report to Infection Prevention directly. Overall reported 2019 hand hygiene adherence was 64% for OBHS and 99% for public health clinics.

Figure 10.1-3: Hand Hygiene Adherence in OBHS and Public Health Clinics



10.2. Rate of Device-Related Infections

Target Zero

Target Zero has been a major institutional focus since 2016. Briefly, Target Zero is the sum of eight quality indicators, four of which are HAI (CLABSI, CAUTI, publicly-reported SSI, and hospital-onset *C. difficile* colitis). As an institution, DHHA's goal is to decrease our Target Zero event count by 10%. Between 2016 and 2019, Target Zero events decreased by 35%. Reductions in the rate of hospital-onset *C. difficile* colitis were the largest driver of this success, having decreased by over 47% during this time period. We are pleased to report that we achieved our 10% reduction goal in 2019. The Target Zero initiative is enormously helpful in engaging the frontline staff in HAI prevention. Summary, unit-level, and individual-level data are posted on our Target Zero website which is available to all staff members.

Education

In 2019, IP staff updated the Annual Education modules to include short segments on job-specific training. All staff that comes into contact with patients are expected to complete a module on transmission-based precautions. Those that insert, maintain, or care for patients with central lines must complete a CLABSI module. The same is true for CAUTI and SSI. All providers must complete an antimicrobial stewardship module. Target Zero also has nursing-focused educational modules that are available throughout the year.

Surveillance

Central venous catheters, endotracheal tubes, and urinary catheters increase a patient's risk for HAI. Denver Health tracks its device-related infections through the CDC's National Healthcare Surveillance Network (NHSN). The Standardized Infection Ration (SIR), a metric generated within NHSN, is used to compare Denver Health to other like units at comparable facilities. It uses important risk factors in historical data to calculate the expected number of infections given a patient population's risk factors for a specific infection event, and subsequently compares this number statistically with the actual number of infections observed. Risk factors that are used to calculate the expected number of infections for CLABSI and CAUTI include location within the hospital, facility type, affiliation with an accredited medical school, and number of beds.

External Collaboratives

Denver Health's Department of Patient Safety and Quality participates in the Vizient Hospital Improvement and Innovation Network (HIIN) Collaborative. Data on infection-related metrics are extracted by Vizient from NHSN, and each metric is paired with a related process metric (Figure 10.2-1).

Figure 10.2-1 has a list of specific interventions to decrease device-related infections that were undertaken in 2019.

Figure 10.2-1: Vizient HIIN Collaborative, DHHA Process Metrics

Infection	Process Metric	2019 Overall
<i>C. difficile</i>	Percent of <i>C. diff</i> rooms receiving UV light treatment	
	Inpatient	95.0%
	ED	91.9%
CLABSI	Compliance with central line maintenance bundle	50%
CAUTI	Median (IQR) time from Foley placement to removal	20.4 hrs (8-46 hrs)
VAP	Percent of vent days with spontaneous breathing trial	
	SICU	83%
	MICU	83%
SSI	Adherence to perioperative colon bundle elements	
	Wound protector	63%
	Separate closing tray	90%
	Change gloves prior to closing	97%
	Dressing / Suture closure table	90%
	Date / Time of wound dressing	80%

Central Line Associated Bloodstream Infections (CLABSI):

Hospital-wide surveillance for CLABSI began in 2010. Denver Health CLABSI rates over the last 5 years, and the corresponding NHSN percentile, were as follows in Figure 10.2-2:

Figure 10.2-2: DHHA CLABSI rate per 1000 central line days

	2015	2016	2017	2018	2019	2019 SIR*
MICU	1.4	1.4	1.1	1.8	0.0	0.0
SICU	4.5	3.1	2.7	2.2	2.3	1.3
PCU	4.9	0.0	0.0	0.0	0.0	0.0
PICU	0.0	0.0	0.0	0.0	0.0	0.0
NICU	5.6	3.4	0.0	1.2	1.3	1.0
Med/Surg	1.0	0.9	0.6	0.5	0.2	0.2

*SIR: Standardized Infection Ratio

The Vascular Access-Infusion Therapy Council (VAIC), with more than 20 members from a variety of departments and roles, will oversee the dissemination of new processes and procedures, products and practices throughout the hospital. In 2019, this committee began surveillance for bacteremia associated with midline catheters and deep venous thrombosis associated with both PICC and midline catheters.

In addition to targeted interventions for CLABSI, regular audits were conducted for adherence to best practice central line care and to the TPN Guideline. Bedside audits on central line maintenance practices are performed on a biweekly basis. Real-time CLABSI notifications were provided to nurse managers and physicians as well as the monthly line listing to each unit. Also universal decolonization was continued in the critical care units (including chlorhexidine bathing and mupirocin nasal ointment) and chlorhexidine bed baths for patients on acute care floors.

Finally, avoidance of unnecessary central lines continued to be a 2019 DHHA goal. For all units, DHHA's central line utilization was significantly lower than NHSN benchmarks in 2019 based on the NHSN's standardized utilization ratio (SUR). The SUR is a ratio of observed to expected device days, calculated based on 2015 NHSN national benchmark data. Compared to 2015 benchmark data, a ratio < 1 indicates lower utilization, and a ratio > 1 indicates higher utilization. Findings are described in table below. Daily assessment of catheter need is done by the care team and documented in Epic.

Peripheral IV Catheter Infections

We found that our units were not following the policy of changing a peripheral IV catheter placed outside of our facility within 24 hours of presentation to the hospital. We worked with Nursing Informatics to modify the nurses' view of Lines, Drains, and Airways to mark these peripheral IVs as being "overdue" for removal. The peripheral IV catheters placed outside the hospital are also mentioned each weekday on the daily safety briefing to encourage nurse managers to support their staff in removing these peripheral IV catheters.

Ventilator Associated Pneumonia (VAP):

In 2017, NHSN implemented standardized infection ratios (SIR) for VAE. However, NHSN's benchmarking is sub-optimally aligned with our institutional surveillance schema. We continue to evaluate the potential for using Trauma Quality Improvement Program (TQIP) benchmarking as an alternative. TQIP uses NHSN definitions for case determination, but calculates a quarterly rolling benchmark rather than a static benchmark like NHSN.

Since the change in NHSN definitions for VAP, rates have decreased substantially and continue to remain low relative compared to those observed with the old definitions (Figure 10.2-4).

Interventions are championed by the IP, Patient Safety and Quality, unit managers and educations, directors, respiratory therapists and other front line staff. The VAP Bundle includes the following key elements:

- Minimize duration of ventilation
- Daily assessment of readiness to wean
- Daily interruption of sedation
- Elevate head of bed
- Regular oral care
- Continuous aspiration of subglottic secretions

Infection Prevention set up a data warehouse report allowing us to assist Respiratory Therapy in tracking daily screenings for spontaneous breathing readiness. During the course of normal patient care, this screening is expected to be performed every day that a patient is on a ventilator. Each month for MICU and SICU, the number of screenings is divided by the number of ventilator days and the proportion of vent days with a screening for a spontaneous breathing trial is reported to respiratory therapy. From 2017 to 2019, this proportion increased from 78% to 83% in SICU, and 80% to 83% in MICU.

Figure 10.2-3: DHHA Ventilator Associated Pneumonia (VAP) per 1000 V

	2014	2015	2016	2017	2018	2019
MICU	0.0	0.0	1.0	0.7	1.1	0.0
SICU	1.2	0.3	1.2	1.8	1.4	4.1
PCU	2.8	0.0	0.0	0.0	0.0	5.6

Catheter-Related Urinary Tract Infections (CAUTI):

Hospital-wide surveillance for CAUTI began in 2013. Although this is a low morbidity/mortality infection, it is a priority for IP because CAUTI a) can be caused by antibiotic-resistant pathogens; b) is not reimbursed by CMS; and c) is an indicator of nursing quality.

DHHA CAUTI rates over the last 5 years, and the corresponding National Healthcare Surveillance Network (NHSN) percentile, is shown below.

Figure 10.2-4: DHHA CAUTI rate per 1000 catheter days

	2015	2016	2017	2018	2019	2019 SIR
MICU	1.2	1.5	0.9	0.0	2.5	2.1
SICU	3.3	2.6	2.5	1.6	3.6	1.5
PCU	4.3	3.5	3.5	2.1	1.0	1.0
PICU	10.6	0.0	10.3	0.0	0.0	0.0
Rehab	4.8	7.3	0.0	2.9	4.9	-
Med/Surg	2.5	2.1	1.2	0.5	1.3	1.3

The nursing staff designated CAUTI reduction as a major goal between 2016 and 2019, and they will continue this in 2020. To this effect, nurse educators perform rounds to audit urinary catheter maintenance/care. Additionally, Nursing Informatics developed a standard place for nurses to document urinary catheter maintenance/care and the IP team will be adding urinary catheter maintenance/care audits to their weekly device rounding. ICU bedside rounds.

Infection Prevention staff launched a bundled order for urinary catheters that includes insertion, maintenance, and removal. This empowers nurses to remove the urinary catheter when the “indication for insertion” is resolved.

We had disappointing results with CAUTI prevention in 2019 with an SIR that did not drop below 1.0 for the entire year. All areas had higher levels of CAUTI than anticipated, although our adult ICUs accounted for the majority of infections identified. A Foley catheter cross-sectional study was conducted by the vendor of our Foley catheter products in mid-2019. After receiving those results, a task force was assembled in Q4 2019 to further investigate the root causes, identify processes and systems to target for improvement, and develop and begin implementation of interventions. Products assessment was conducted by representatives from adult ICU leadership to determine if another product may help insertion practice to better adhere to sterile technique.

Future Directions

- Infection Prevention will be implementing various programs to improve eHH rates throughout 2020.
- The paramedics are implementing a new peripheral IV catheter kit including a saline lock in January 2020 in an effort to decrease the risk of infection.
- Other major opportunities for CAUTI Bundle improvement in 2020 include:
 - ◇ Urine testing only when clinical symptoms or signs of UTI are present
 - ◇ Prompt removal of the urinary catheter when it is no longer indicated
 - ◇ Appropriate Foley catheter maintenance procedures
 - ◇ Removal and/or changing the Foley catheter prior to obtaining a urine sample
 - ◇ Continuing to use urinalysis to determine which urine samples are appropriate for culture.
- The Bundled Order has shown very low utilization, so we will be modifying it in 2020.

10.3. Surgical Site Infection (SSI) Rates

DHHA performs SSI surveillance for 17 procedures including 2 nationally-reported procedures, 5 state-reported procedures, and 12 additional procedures that we deem to be high impact to our patient population. As a result, we began surveillance for SSI after ambulatory trans-rectal prostate biopsy and gender confirmation surgeries this year.

SSI rates over the last 5 years and benchmarking based on the Standardized Infection Ratio (observed/expected infection rate based on individual patient risk) are shown on the next page (Figure 10.3-1).

Figure 10.3-1: DHHA SSI rate per 1000 procedures

	2015	2016	2017	2018	2019*	2019* SIR
Knee Arthroplasty	0.0	0.6	1.0	1.4	1.7	2.2
Hip Arthroplasty	5.3	2.8	3.3	0.8	3.6	2.7†
Abdominal Hysterectomies	3.9	1.2	4.8	1.2	0.8	0.4
Vaginal Hysterectomies	0.0	3.0	1.2	0.0	1.3	-
Craniotomies	0.9	3.9	4.1	2.3	1.4	1.0
Spinal Fusions	1.2	1.3	0.6	3.5	1.8	1.5
C-sections	0.0	1.7	2.0	0.7	0.4	0.4†
Hemiorrhaphy	1.6	1.6	1.9	0.2	1.1	1.8
Colon Surgeries	11.0	11.0	6.2	3.4	3.5	0.5
Breast Surgeries	1.7	2.2	1.0	1.4	0.7	0.7
Prostate and Nephrectomy Surgeries [∞]	7.1	1.9	0.0	4.1	0.0	-
Open reduction of fracture	2.2	1.8	1.4	1.8	1.3	1.7
Vascular surgery‡	4.8	2.0	0.8	1.8	0.0	-

†Significantly different than expected (SIR less than 1.0 indicates fewer infections than expected; SIR greater than 1.0 indicates more infections than expected).

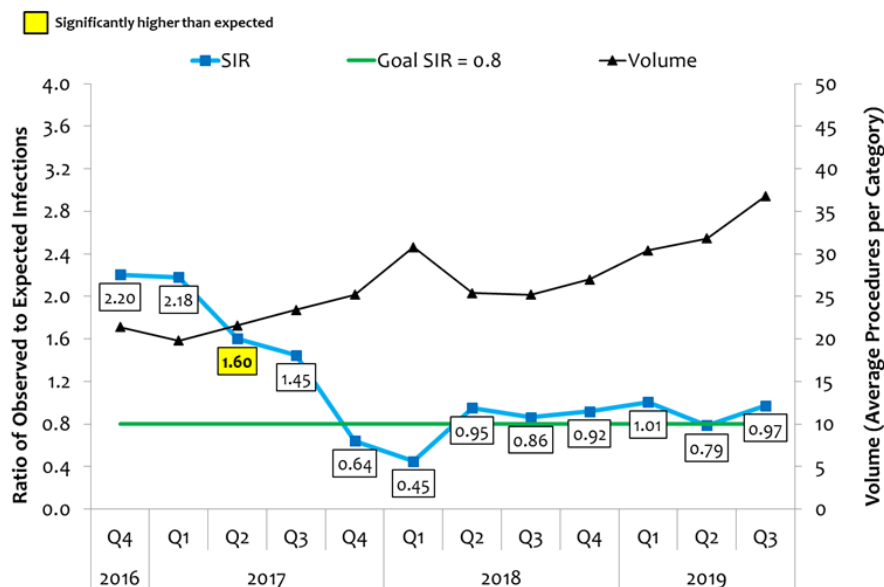
[∞]Nephrectomy procedures added January 2014.

‡Vascular surgery SSI surveillance began January 2014. Procedures under surveillance include abdominal aortic aneurysm, AV shunt for dialysis, carotid endarterectomy, and peripheral vascular bypass.

*Cumulative data includes 2018Q4-2019Q3.

Because of our vertically integrated system, DHHA has the advantage of doing thorough post-discharge infection surveillance that most hospitals are unable to do. The ability to do thorough surveillance may make rates appear higher than other hospitals reporting to NHSN.

Figure 10.3-2: Surgical Site Infection Standardized Infection Ratio (SIR), 2016-2019



Colon SSI Prevention Bundle

In 2015, a multidisciplinary group was formed to focus on Colon SSI reduction. The team consisted of OR technicians and nurses as well as general surgeons and infection preventionists. A colon bundle was created which consisted of pre-, intra- and post-operative interventions (Figure 10.3-3). In 2019, we made all of the bundle components electronically available for improved efficiency.

Figure 10.3-3: DHHA Colon Surgery SSI Rate, 2015-2019

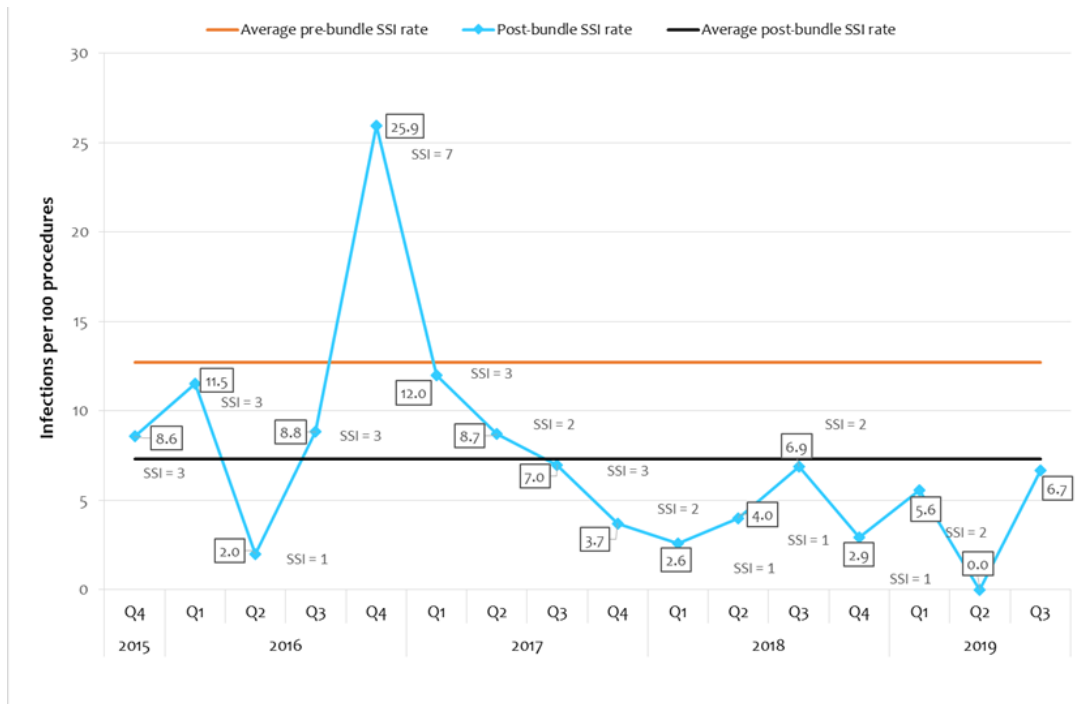


Figure 10.3-4: DHHA Colon Bundle Adherence by Surgeon Indicator

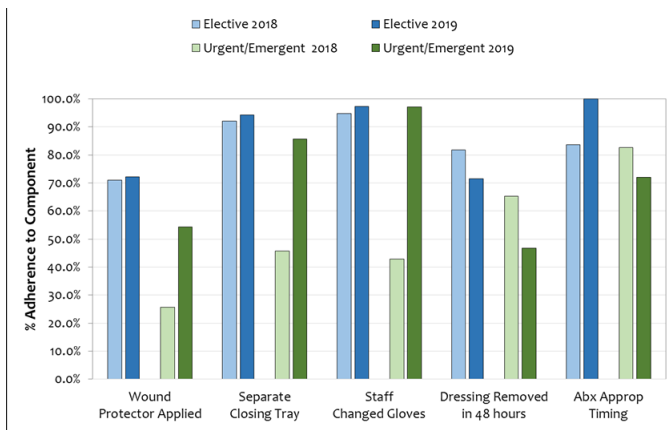
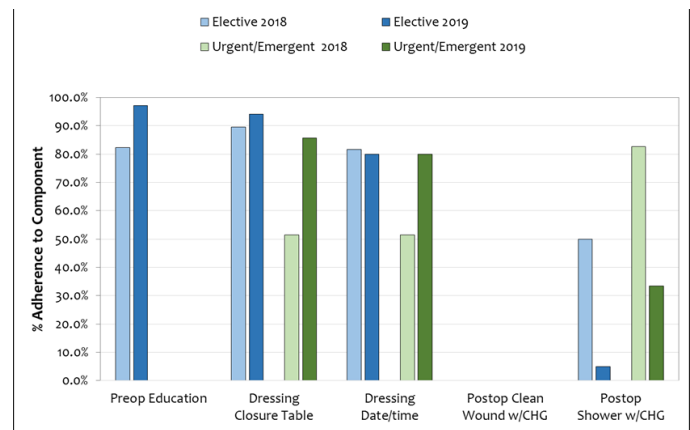


Figure 10.3-5: DHHA Colon Bundle Adherence by Nursing Indicator



It was noted that certain components of the colon bundle have higher adherence than others (Figure 10.3-4 and Figure 10.3-5).

Gynecology SSI Prevention Bundle

A review of outcomes (pre- and post-bundle) and compliance (post-bundle) in December 2019 indicates that overall compliance ranged from 74% (abdominal hysterectomies) to 94% (urgent/unscheduled cesarean sections). Compliance for individual component measures was 90% or greater for all measures except preoperative chlorhexidine shower. Additionally, preliminary outcome results indicate a 59% reduction in unadjusted relative risk with the primary outcome of SSI/wound complication combination, largely driven by cesarean sections. Unadjusted relative risk of secondary outcomes (SSI and wound complications separated) among the entire cohort (both procedures) was reduced by 69% (SSIs) and 75% (wound complications). Additional analyses will be conducted to

control for factors known to be associated with increased risk of wound complications (e.g., age, BMI, acuity score, etc.).

Perioperative skin preparation

We evaluated the quality of perioperative skin preparation in 2017 and continued to evaluate it through 2019. It was found that adherence to both the AORN and manufacturer recommendations could use significant improvements. In-service sessions by the skin preparation manufacturers were undertaken with the staff throughout the year. A post-education evaluation of skin preparation revealed significant improvements.

Figure 10.3-6: DHHA Improvements in Perioperative Skin Preparation, 2018

Variable	Baseline N = 72	Intervention N = 52	P-value ^a
Hand hygiene prior to prep, n (%)	1 (1)	25 (48)	<0.001
Sleeves worn during prep, n (%)	1 (1)	35 (67)	<0.001
Gloves worn during prep, n (%)	71 (99)	52 (100)	1.00
Correct cleansing time, n (%)	34 (47)	44 (85)	<0.001
Correct drying time, n (%)	48 (67)	33 (87) ^b	0.02
Cleansing motion from incision to periphery, n (%)	56 (78)	50 (96)	0.004

Surgeon-specific reports

Since 2011, Infection Prevention has generated biannual surgeon-specific SSI reports to support the Ongoing Physician Performance Evaluations (OPPE) process. This reporting continued into early 2019. During 2019, the medical staff of office and others within the Department of Medicine worked to develop a procedure to leverage Epic in order to generate these reports themselves. Pending the results of these efforts, Infection Prevention may be asked to continue generating these reports as previously done.

In 2019, other procedure-specific interventions were performed including:

- Notified OR leadership of SSI each month
- Updated the annual SSI training module for all staff that care for surgical patients
- Updated the pre-operative antibiotic policy and loaded onto antimicrobial stewardship smartphone app for providers to use (see ASP 2019 Achievements below).

10.4. Multi-Drug Resistant Organisms

Our goal is to minimize hospital-associated spread of MDROs and other organisms identified as significant at DHHA. Weekly surveillance of MDROs and organisms of significance in 2019 included:

- *Aspergillus*
- Multi-drug resistant and susceptible *Acinetobacter baumannii*
- Multi-drug resistant *Pseudomonas aeruginosa*
- Carbapenemase-producing enterobacteriaceae (CRE)
- Extended spectrum beta lactamases (ESBL)
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant *Staphylococcus aureus* (VISA/VRSA)
- Vancomycin-resistant enterococci (VRE)
- *Clostridioides difficile*
- Influenza virus
- Hospital-onset Legionella
- Hepatitis A

10.4-1: DHHA Rates of MDRO in Hospitalized Patients, 2015 – 2019 [§]

	2015	2016	2017	2018	2019
<i>Acinetobacter baumannii</i>	0.10	0.06	0.13	0.08	0.08
<i>Aspergillus</i>	0.02	0.02	0.08	0.05	0.08
Hospital-acquired <i>Clostridioides difficile</i>	0.85	0.75	0.56	0.63	0.40
Extended spectrum beta lactamases (ESBLs)	0.11	0.37	0.41	0.60	0.87
Hospital-acquired Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA)	0.26	0.28	0.26	0.44	0.36
Carbapenem-resistant <i>Pseudomonas aeruginosa</i>	0.04	0.10	0.09	0.11	0.15
Vancomycin-resistant enterococci (VRE)	0.15	0.13	0.16	0.21	0.12
Carbapenem-resistant <i>Enterobacteriaceae</i> (CRE)- previously KPC	0.01	0.03	0.00	0.00	0.02
Influenza*	10.2	12.2	20.0	24.1	NA

[§] Per 1000 patient-days (includes community-onset and hospital-onset cases unless indicated otherwise).

* Rate is calculated for each October-March Influenza season.

Aspergillus

Although not an MDRO, this organism is of interest due to frequent construction activities at DHHA. All isolates reported from the clinical lab are recorded to alert IP of potential breaches in construction early, as increase in isolation rates could be indicative of such a breach. We review all positive cultures for *Aspergillus* from both inpatients and outpatients.

Multi-drug resistant *Acinetobacter baumannii*

Our relatively low rate of multidrug resistant *A. baumannii* has been credited to antibiotic stewardship and heightened infection control efforts in our SICU and OR (limited pulsatile lavage on colonized patients, empiric isolation, and decreased fluoroquinolone usage). We have worked with providers to improve practices going forwards.

Methicillin-resistant *Staphylococcus aureus* (MRSA)

Routine monitoring continues to show that the healthcare-associated transmission remains low relative to colonization/infection burden even in the absence of admission screening. Public reporting requirements include hospital-acquired MRSA bacteremia, and data are benchmarked in NHSN (Figure 10.4-2).

In 2019, at least 15 patients had subsequent ED visits after receiving a wound care kit. Further work will be initiated to track this metric over time and standardize so that multiple years can be compared directly.

One component of the skin assessment program was the creation of free wound care kits for patients in conjunction with IP. The kits contained gauze, ointment, band aids, alcohol wipes, and other materials to support patients with the care of their wounds. The kits help empower patients with necessary supplies to properly care for minor wounds, help promote proper skin care, and work to reduce the number of patients needing emergency care for infected wounds outside of the clinic. Approximately, 1,400 kits were dispersed in 2019. The program also worked to assist in the identification and support of patients requiring care at the Infectious Disease Clinic through provision of resources and tools to refer patients needing higher levels of care.

Vancomycin-resistant enterococci (VRE)

Rates of VRE have demonstrated a downward trend from 2017-2019 (Figure 10.4-3), and remained below the historical average during most of 2019. Each case was reviewed in detail and any potential clusters evaluated. In conjunction with the response to several patients in the hospital identified with CRE, several VRE rectal screens were conducted in SICU and MICU in 2019. Patients identified as positive are then isolated and a 'VRE' flag is automatically electronically added to their chart in Epic. The antibiotic stewardship program continues to be closely involved in the VRE reviews and discussions.

Clostridioides difficile

Rates of community-acquired *C. difficile* have increased steadily over the past few years while hospital-acquired *C. difficile* decreased between 2015 to 2019.

Figure 10.4-2: Standardized Infection Ratio for Hospital-Acquired MRSA Bacteremia Infections, 2016-2019

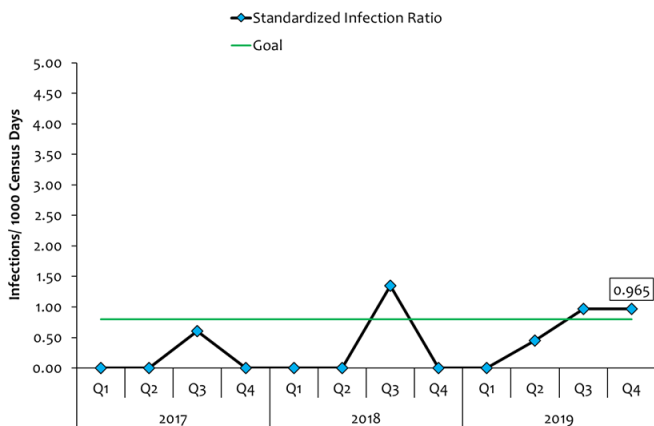


Figure 10.4-3: Positive Vancomycin-resistant *Enterococcus* culture rate, 2016-2019

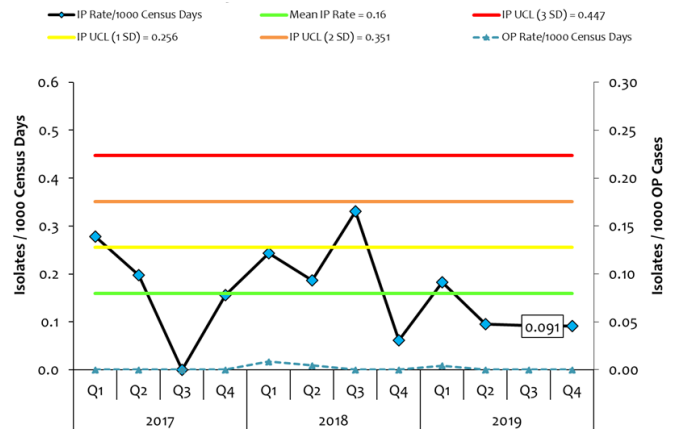
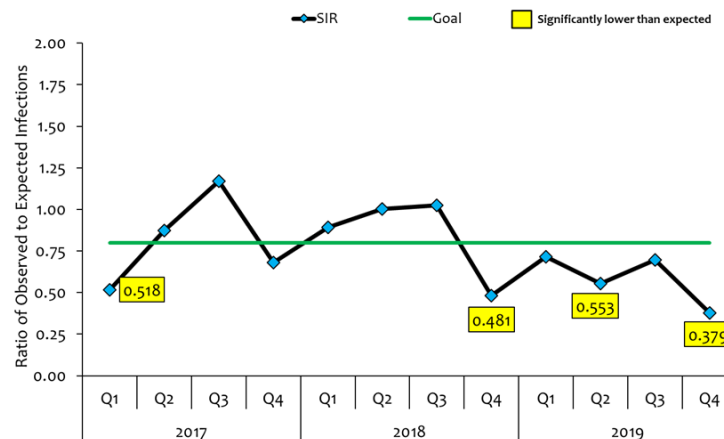


Figure 10.4-4: *Clostridioides difficile* Standardized Infection Ratio, 2017-2019

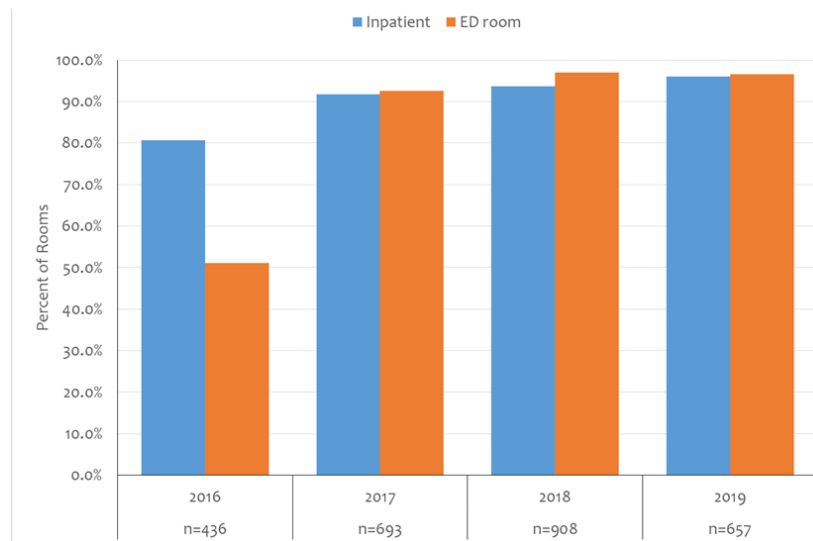


C. difficile was a major institutional focus in 2017 through 2019. In 2019, approximately 96% of both inpatient and ED rooms previously occupied by patients with *C. difficile* colitis had been treated with UV lights after terminal clean at discharge. ED and urgent care rooms, OR suites, the hemodialysis unit, and the admission-discharge unit are also treated with a UV light once weekly (Figure 10.4-1).

Based on results of a Masters in Public Health student’s capstone project related to adherence to PPE among healthcare workers, we purchased a portable sink and have deployed it to one med/surg unit (8th floor). The sink is placed outside of *C. difficile* patient rooms when needed, and is refilled by EVS staff. It has been well-received by staff with 42 percent of the respondents more likely to wash their hands if a portable sink was present.

Additionally, a majority of the respondents had a preference of washing their hands right outside the patient’s room. We also have added visual reminders on isolation carts to improve HH prior to entering or after exiting an isolation room (Figure 10.4-5).

Figure 10.4-5: Proportion of rooms previously occupied by patients with *Clostridioides difficile* infection that received UV disinfection treatment



In November 2019, we further modified the rapid *C. difficile* order in Epic to reduce inappropriate testing, particularly among patients on laxatives. When a provider orders a rapid *C. difficile* test and laxatives have been administered in the previous 24 hours, a comment stating this information is given to the provider prior to signing the order. Prior to this intervention, the ordering provider would have to cancel out of the order to go into the medication administration record (MAR) to see if laxatives were administered in this timeframe, which likely was not happening and an order was placed without reviewing the MAR. Before this electronic decision support was put in place, we observed that 21% of orders were on patients who had received laxatives in the previous 24 hours (and the ordering provider indicated that he/she had not). In the first two months of implementation, that has dropped to 12%. An additional planned change to Epic is to not allow a *C. difficile* test order (either rapid or multiplex PCR) to be ordered if (1) the patient has a positive test in the previous 30 days or (2) the patient has a negative test in the previous 7 days.

Carbapenem-resistant *Enterobacteriaceae* (CRE)

Previously noted as KPC and Extended-spectrum beta lactamases (ESBLs).

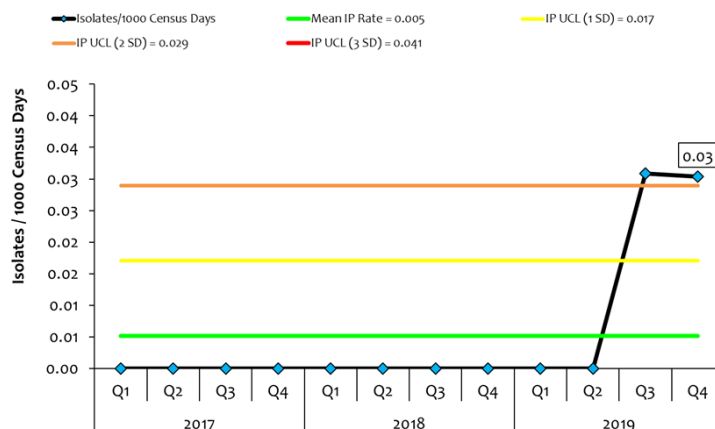
In 2019, we had two patients with plasmid-mediated carbapenemase production. One patient was discharged from the hospital shortly after the resistant *P. aeruginosa* bacteria was encountered. Working closely with CDPHE, we temporarily restarted the active surveillance program using rectal swabs in the medical ICU. We found no other patients with either colonization or infection with this resistant organism. We audited hand hygiene from this patient's room during the patient's hospitalization. We developed and distributed educational materials for staff members, patients, and family members. The second patient was found to harbor a very resistant *E. coli* bacteria prior to a planned surgical admission. The patient was placed into isolation precautions upon entry to the hospital. Active surveillance was performed for patients on the same unit as this patient. No spread of this organism was seen. Based on this experience, we are working with our adult ICU leadership to make the active surveillance program permanent for the foreseeable future. Work that is being done includes easing the burden on nursing staff relating to the actual ordering of the surveillance swab PCR tests in order to ensure that the program is sustainable.

Rates of multi-drug resistant gram-negative organisms such as extended-spectrum beta-lactamase (ESBL)-producing *E. coli* continue to increase in our outpatient population which is consistent with national trends. Rates of imipenem-resistant *P. aeruginosa* infections have progressively declined at DHHA over time and remain low. Aggressive surveillance, isolation, and antibiotic stewardship have kept these organisms from becoming endemic at DHHA.

Electronic monitoring of significant labs is performed to minimize paper waste, improve efficiency, and minimize data entry burden for staff. We review these data daily, weekly, and monthly to identify clusters that may indicate an outbreak situation. Surveillance data are reported quarterly to the Infection Prevention committee.

We maintain a close relationship with the microbiology lab. IP attends microbiology rounds each week during which we discuss any concerning infection patterns, incoming microbiology testing platforms, and interesting clinical cases.

Figure 10.4-6: Culture positive rate for CRE at Denver Health, 2017-2019

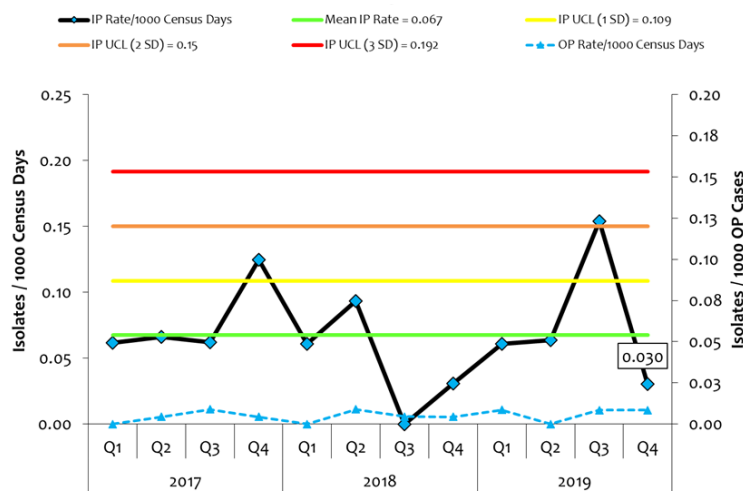


There was a substantial amount of construction in 2019 including continuation of the construction on a new Outpatient Medical Clinic. The IP personnel continued to attend meetings starting with predesign and preconstruction, including a weekly meeting where all ongoing projects are discussed. Routine walk-throughs were done in all construction areas requiring containment as well as others on an as-needed basis. Infection Control Risk Assessments (ICRAs) were done prior to the start of any construction and the contractors are in-serviced about the infection prevention concerns related to hospital construction.

Environment of Care rounds were made by the Infection Prevention staff routinely. The frequency was based on risk as determined by the ICRA. Both planned and surprise visits were conducted. Routine rounds, both announced and unannounced, showed good adherence to Infection Prevention requirements. Significant efforts were made towards increasing education of managers, educators and front-line staff around many expectations for regulatory compliance and ensuring enhanced patient safety, such as discarding expired supplies, preventing cardboard shipping containers from being stored in patient care areas, and ensuring that maintenance work orders were placed promptly to repair/replace damaged items such as ceiling tiles.

Rates of *Aspergillus* isolated in clinical cultures also were reviewed by IPC on a regular basis (Figure 10.4-7).

Figure 10.4-7: Culture positive rate for *Aspergillus* at DHHA



Future Directions

- To address this and improve the colon SSI bundle rates even further, the team will be focusing on the lower adherence regions for 2020.
- The VRE surveillance screening program will be restarted in 2020.
- Another model of portable sink has been identified based on feedback from providers, that should be more user-friendly and easier to mobilize. We plan to expand this project to the 9th floor and to the ACUTE unit in 2020.

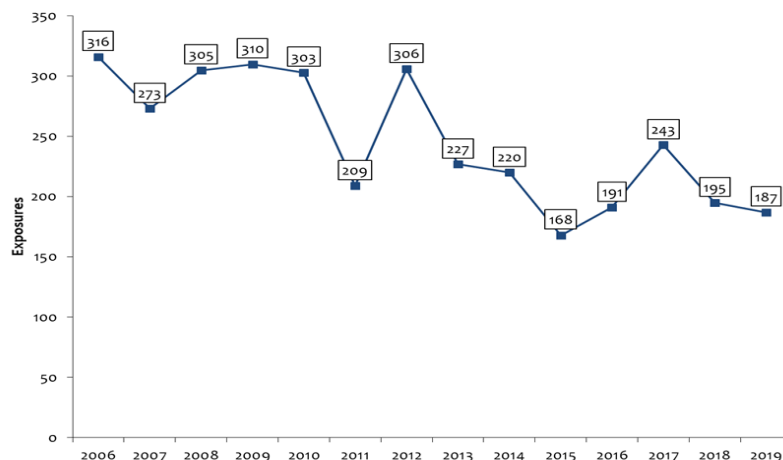
10.5. Collaboration with Center for Occupational Safety and Health

Infection Prevention works closely with COSH to decrease occupational infection related hazards through the following processes:

- Universal employee influenza vaccination
- New employee orientation
- Annual competency training on bloodborne pathogen exposures
- Consultation with COSH providers regarding employee exposures to potentially infectious pathogens
- Development of protocols for the OUCH line
- Representation on Products Committee to identify devices to minimize employee exposures
- Guidance for employees to return to work after a potentially infectious condition

COSH collects exposure details regarding each exposure event. The details collected allow better direction of the education opportunities. These data are presented at the Infection Prevention Committee meetings. During these discussions, input from experts and front line staff are gathered on how to formalize interventions and better prevent these exposures in the future (Figure 10.5-1).

Figure 10.5-1: Number of Total Exposures by Year at Denver Health, 2006-2019



Of note, the OBHS clinic has not had an exposure reported for four years. We attribute this success to the awareness of staff members and the presence of sharps containers and safe syringe disposal containers in all bathrooms.

Bloodborne pathogen exposure

The bloodborne pathogen exposure (BBPE) protocol has undergone a number of revisions in the past 10 years, and yet the process was suboptimal. There was an online document of 10 pages in addition to two policies. In 2018-2019, we worked with COSH to streamline the reporting process for BBPE.

Influenza Vaccination

DHHA has mandated employee influenza vaccination since the 2011-2012 influenza season. The rationale for implementing such a policy reflects our appreciation that influenza is a serious illness that results in significant patient mortality each year. Influenza is

highly contagious and can spread rapidly through a health care facility, particularly in our at-risk inpatients. In addition, up to 25% of HCWs contract influenza each season. We also appreciate that influenza seasons correlate with staffing shortages, as evidenced by an increase in sick calls at DHHA correlating with influenza peak activity during the past 5 flu seasons. Healthcare workers might work while ill and/or might have minimal symptoms but be able to transmit virus to patients or co-workers. It is also clear that the vaccine is most effective in younger, healthier people, such as our employee population. Finally, there are data showing:

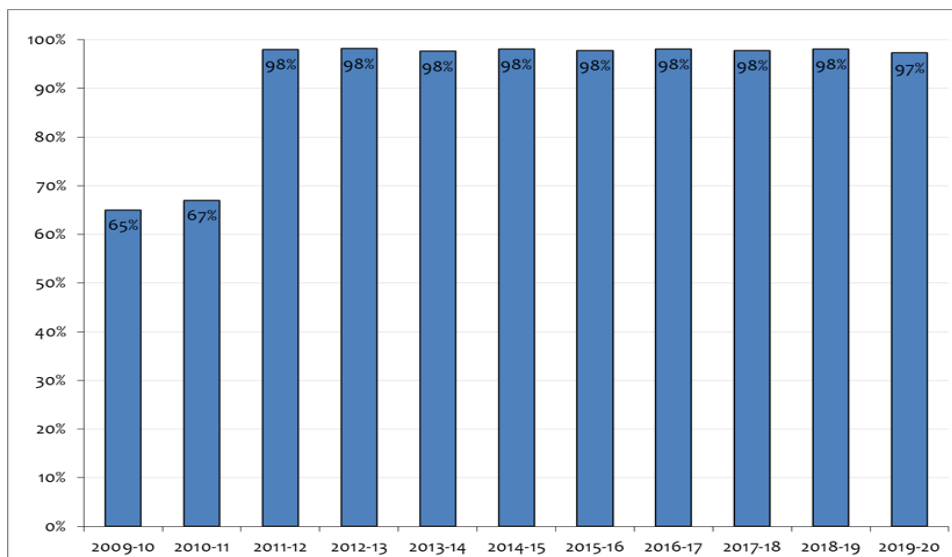
- Decreased mortality in patients (LTCH)
- Decreased influenza among vaccinated HCWs
- Decreased nosocomial influenza among hospitalized patients
- ~ 50% fewer sick days in workers who receive influenza vaccine

DHHA has successfully implemented, and continues to refine, an electronic tracking system that allow managers to track real time the status of their employee as well as the IP team to track and report data as needed. The developed tracking system, HANDI, has been recognized by the CDC as superior tool for mass vaccination clinics and the development team has received national awards.

IP and COSH have successfully partnered with the other academic teaching facilities in the Denver area to assure all residents and faculty has been vaccinated.

Ultimately, DHHA has vaccinated at least 97% of all employees/contractors against seasonal influenza since the implementation of this policy. The exemption rate for those with medical contraindications or religious waivers averages 2% each year.

Figure 10.5-2: DHHA Influenza Vaccination Rate Among Targeted Employees by Influenza Season



Future Directions

- We will be working with staff to ensure adherence to the new processes for BBPE, and we will implement timely “swarm” events when the process is not optimally followed so that we can continually troubleshoot and improve our process.

10.6. Collaboration with Environmental Services (EVS)

Infection Prevention continues to work closely with the EVS program to focus on environmental cleaning protocols. In 2018, our accomplishments included:

Improved communication between EVS and clinical leadership. While we piloted monthly meetings dedicated to improving communication between EVS and nursing management, we found that these were poorly attended. Therefore, we dedicated time during monthly Infection Prevention Committee meetings for EVS to provide data regarding their use of ultraviolet lights and cleaning products. Because Infection Prevention Committee meetings have clinical representation from a variety of settings, we have found that this meeting is an ideal forum for this data to be presented.

Evaluated cleaning processes in the OR

IP staff closely evaluated all the processes utilized in the OR for case turnovers and terminal cleans. We observed numerous staff cleaning rooms and evaluated the use of products and the process. We swabbed numerous surfaces for ATP using the Hygiena ATP technology. After a thorough evaluation, we determined there were many areas of opportunity for improvement. As a result of our recommendations, the OR hired dedicated staff members who trained in depth on OR cleaning. These employees report directly to the perioperative services leadership rather than EVS.

Improvement to cleanliness and safety at OBHS

OBHS and EVS continue to work together to ensure prompt communication and resolution of EVS related issues. Response of EVS personnel was markedly improved during 2018 and 2019 with intentions to enhance efforts into 2020. In an effort to promote cleanliness of shared areas OBHS removed patient recliners within the methadone clinic and replaced patient furniture in therapy areas.

10.7. Ebola and other High Risk Pathogen Preparedness

In 2015, DHHA was recognized by the CDC to be the Department of Health & Human Services (HHS) Region 8 Ebola & Special Pathogens Regional Treatment Center. DHHA was awarded \$3 million dollars to continue to enhance our Ebola and other high risk pathogen program over the next 5 years (2015 – 2020). In 2019, infection prevention had several achievements including:

- **Completing and exceeding all grant deliverables by stated deadlines.**
 - ◇ DHHA met and exceeded the exercise deliverables required to maintain the RESPTC designation including perform quarterly hospital, state, regional, and federal exercises. We participated in an annual NETEC site visit to evaluate our capability to care for patients with high risk pathogens. Additionally, we continually acquire and inventory supplies for trainings, exercises, and potential treatment needs.
- **Conducting quarterly staff personal protective equipment (PPE) practice, drills, and simulation training.**
 - ◇ We continue to train and track staff competence in donning and doffing high level PPE.
- **Supporting training and education opportunities for high risk infection team (HITeam) members.**
 - ◇ HITeam members attended national and federal educational and training opportunities hosted by NETEC. The training and educational classes provided hands-on experience for members to learn, apply, and share the best practices for high risk pathogens in the country at our facility.
- **Provided regional mentorship and education.**
 - ◇ DHHA mentored two hospitals working to develop and optimize their high-risk pathogen programs. The mentorship included sharing of standard operating procedures (SOPs), onsite observations and participation in trainings and exercises, and planning for future collaboration and coordination.
- **Plan and host a NETEC Emerging Infectious Disease workshop for healthcare providers.**
 - ◇ The HITeam planned and facilitated a NETEC course in Denver, CO over a two-day period. The course helped prepare institutions for an emerging infectious disease and provided guidance on best practices and infection control practices.

10.8. Optimization of High Level Disinfection (HLD)

In addition to the goals and achievements above, it was identified standardization of high level disinfection and cleaning of shared patient equipment as major goals in 2019.

High level disinfection (HLD):

High level disinfection was historically performed in up to 13 of our departments and clinics. On routine audits, it was found that HLD practices were not as precise as the organization would expect. To address this issue, multiple quality improvement and quality assurance programs were implemented starting in 2016. In 2019, it was determined that HLD practices were still not as standardized and consistent as the organization would expect so new interventions were designed and deployed including:

-
- Investment in the Trophon system for all locations where it is appropriate including all off-site clinics and multiple on-campus locations.
 - Consolidation of all OPA HLD in to the Sterile Processing Department
 - Creation of a dedicated OPA HLD space on the 2nd floor of Pav A, near the OR
 - Hiring of three additional staff dedicated to perform HLD
 - Validation of HLD competency of staff for each type of equipment
 - Review and revision of HLD standard work
 - Developed and deployed HLD pre-cleaning education for appropriate staff in each area
 - Revision of the organizational HLD policy
 - Review and revision of HLD annual competency tool
 - Review and revision of HLD audit tool
 - Ongoing, routine HLD audits by IP staff
 - Continuation of the HLD Council for oversight of HLD throughout the organization

10.9. Patient Equipment Cleaning

Shared medical equipment – low level disinfection:

A multi-disciplinary team participated in a Lean value stream analysis (VSA) event to identify best practices and improve efficiency and effectiveness of patient equipment cleaning/low-level disinfection. The VSA participants developed a comprehensive patient equipment cleaning guideline with designated roles, an evaluation plan for patient equipment cleaning, and standard work for all parties involved in patient equipment cleaning. In 2019, the policy for patient equipment cleaning was finalized.

Infection Prevention has invested in OneSource, an online resource that provides specific manufacturer-recommended instructions for the use (IFU) for most medical devices. While comprehensive, the system is not intuitive to navigate, and the expectation of front-line staff to become adept at navigating OneSource was deemed unrealistic. Therefore a risk assessment has been developed to assess the risks and benefits of not expecting front-line staff to be able to know and ensure they are following the equipment manufacturer's instructions for use (IFU) when they are doing low-level disinfection.

The solution being proposed for education to front line staff is to ensure that staff clean equipment between each patient, use a hospital-approved disinfectant (or disinfectant wipe), and follow the instructions on the disinfectant product label for effective use. In this risk assessment framework, knowledge of the equipment manufacturer's IFU is less important than having a simple cleaning schema where staff know when to clean equipment and can easily choose an effective disinfectant product from among only a few that are available, rather than having to know a more complicated set of products and risk improper/inadequate disinfection.

Future Directions

- In 2020, the IP team will focus on the policy roll out, education, and ongoing evaluation of patient equipment cleaning by clinical staff and ancillary services.

10.10. Beyond Hospital-Acquired Infections, Other Accomplishments in 2019

In addition to these accomplishments, we partnered more closely with emergency medical services (EMS) in 2019. Initiatives included ambulance cleanliness, infection prevention education, and increased collaboration and communication for outbreaks in the community. We look forward to continuing these in 2020.

11. Antibiotic Stewardship

11.1 Analysis of 2019 Goals

In 2019, the AS Program maintained the following interventions and surveillance activities with goals of optimizing antibiotic use for our patients in order to maximize the chance for good clinical outcomes and prevent antibiotic resistance, *Clostridioides difficile* infection, and other antibiotic-related adverse events.

- Quarterly antibiotic utilization and cost surveillance
- Development of antibiograms and assessment of antibiotic resistance trends
- Formulary restriction and pre-authorization (via the Antibiotic Stewardship Pager) for broad-spectrum, toxic, or high-cost antibiotics
- Post-prescription review with real-time prescribing recommendations to providers
- Development, implementation, and maintenance of Clinical Care Guidelines for common infections
- Review of new FDA-approved antimicrobials for addition to the Denver Health formulary
- Expansion and maintenance of the Antibiotic Stewardship smartphone application and the Antibiotic Stewardship subsite on the Pulse
- Monthly meetings of the Antimicrobial Subcommittee of P&T
- Submission of antibiotic utilization data to the CDC/NHSN Antibiotic Use (AU) module
- Feedback of individualized and aggregate antibiotic utilization data to MICU and outpatient Internal Medicine providers
- Stewardship of infectious diseases diagnostic tests
- Continuation of a pharmacist-managed procalcitonin protocol and formal antibiotic timeout for the MICU
- Continuation of a protocol to administer a probiotic to patients receiving broad-spectrum antibiotics to prevent antibiotic-associated diarrhea and *C. difficile* infection
- Facilitation of fecal microbiota transplants for patients with recurrent *C. difficile* infection through procuring frozen, pre-screened specimens

The following figures show the National Healthcare Safety Network (NHSN) standardized antibiotic administration ratio (SAAR) – the ratio of observed to expected antibiotic use at Denver Health – over time. Both the adult and pediatric SAAR have been consistently less than 1.0, representing lower observed antibiotic use than would be expected for a hospital with Denver Health’s characteristics. For example, in Q4 2019, the adult SAAR value of 0.82 can be interpreted that 18% fewer antibiotics were used at Denver Health than expected based on these national data (Figure 11.1-1).

Figure 11.1-1: DHHA SAAR—Adult ICUs and Wards

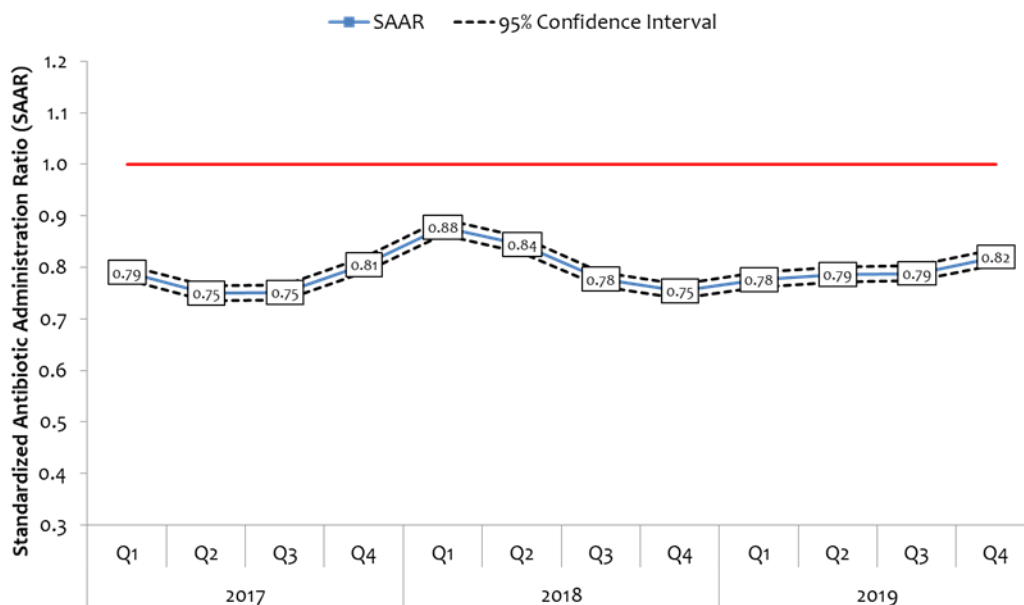
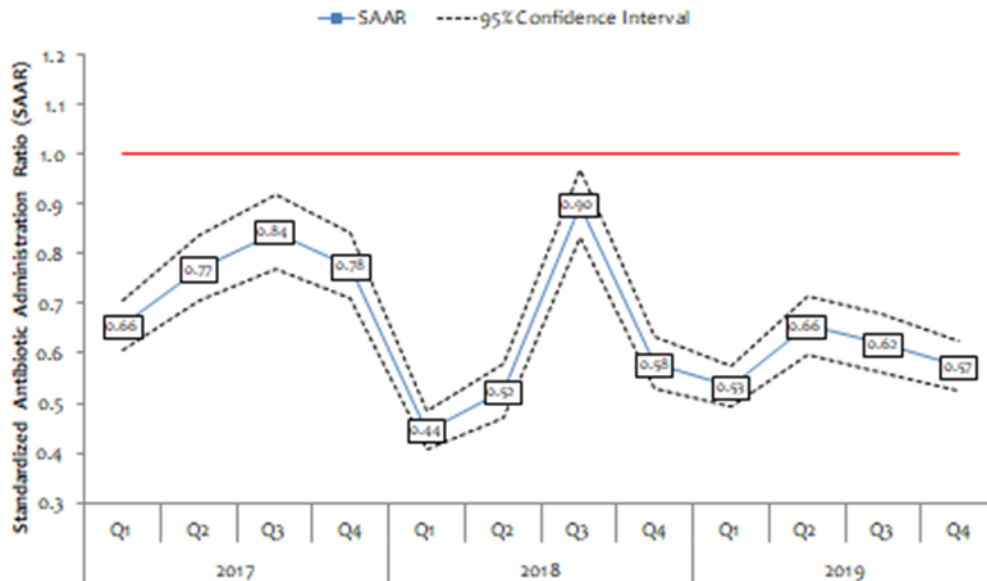


Figure 11.1-2: DHHA SAAR—Pediatric ICUs and Wards



In 2019, the AS Program focused on expansion of services and new initiatives in three areas:

- Community-based antibiotic and addiction treatment for persons who inject drugs (PWID)
- Integration of PGY-2 Infectious Diseases Pharmacy Residency into Stewardship
- Individualized prescribing feedback to Hospitalists with Peer Comparison

Community-based antibiotic and addiction treatment for persons who inject drugs (PWID) hospitalized with serious bacterial infections

Increasing rates of opioid and methamphetamine use disorders have resulted in increasing numbers hospitalizations of persons who inject drugs for severe bacterial infections, such as endocarditis and bone or joint infections. These infections typically require 4 – 6 weeks of intravenous (IV) antibiotic therapy, and patients are frequently kept in the hospital for the entire duration of therapy because of a lack of alternatives to safely administer IV antibiotic therapy. With state opioid response funding, DHHA developed a new partnership with Sobriety House whereby eligible patients are discharged to Sobriety House to undergo intensive residential addiction treatment while receiving IV antibiotic therapy. Co-treatment by addiction and infectious diseases specialist has been shown to improve clinical outcomes for PWID with severe infections; therefore, this innovative treatment model is expected to significantly improve the care of our patients while averting extended hospitalizations solely for administration of long term IV antibiotic therapy.

Program Goal

Improve clinical outcomes for PWID requiring long-term IV antibiotic therapy for serious bacterial infections through a community based addiction and infectious diseases co-treatment program

Outcomes

- Through a substantial amount of internal planning and collaborative work with Sobriety House, this program was successfully launched in July 2019.
- From July – December 2019, 3 patients entered the Sobriety House program for addiction treatment and long-term IV antibiotic therapy (two additional patients entered the program in early 2020).
- All 3 patients successfully completed the 28-day intensive residential treatment program and safely completed their planned IV antibiotic course.
- It is estimated that compared with the alternative of completion of the IV antibiotic course in the hospital, treatment at Sobriety House averted 3-4 weeks of hospitalization per patient.

Integration of PGY-2 Infectious Diseases pharmacy residency into stewardship program

Denver Health was awarded a grant by the Society of Infectious Diseases Pharmacists to start an Infectious Diseases (ID) Pharmacy Residency program for the 2019-2020 academic year. On a longitudinal basis, the resident will perform prospective review with provider feedback and pre-approval of restricted antibiotics, update and develop new clinical care guidelines, serve as the primary preceptor for a pharmacy student or resident, and provide education to pharmacists, providers, other healthcare providers, and patients. The resident will also serve as the ID pharmacy expert for the General ID Consult service, Orthopedic ID Consult service, medical ICU, and public health clinic, each for one month out of the year, as well as the ID Fellow Clinic on a longitudinal basis.

Program Goal

Provide excellent infectious diseases training to the PGY-2 pharmacy resident while expanding our ID pharmacy antibiotic stewardship presence

Outcomes

- The Denver Health Infectious Diseases Pharmacy Residency program was successfully launched in July 2019.
- The resident documented 226 antibiotic stewardship interventions performed between August 1, 2019 and January 13, 2020.
 - ◇ Based on an average of \$80 in avoided antibiotic costs per intervention, this resulted in an estimated total cost-avoidance of \$18,080.
- The resident responded to 33 provider queries made via the antibiotic stewardship pager.
- The resident's research project is underway and on track to be completed by the end of the residency year.
- The resident presented a medication use evaluation which assessed antibiotic prescribing in the outpatient setting at Denver Health at the American Society of Hospital Pharmacists meeting in December 2019.
- The resident wrote a manuscript describing our standardized approach for use of dalbavancin to facilitate early hospital discharge. The manuscript will be submitted for publication during Q1 2020.
- The resident performed 1 penicillin skin test during the fall of 2019 and successfully de-labeled the patient as not penicillin allergic.
- The resident led numerous educational offerings, including:
 - ◇ Authoring of two quarterly educational reviews ("Contagious Conundrums") that were distributed to pharmacy staff.
 - ◇ Presentation of two journal clubs and two educational sessions to pharmacy staff, two microbiology rounds sessions, and seven agenda items for Antimicrobial Subcommittee of P&T.

Individualized prescribing feedback to Hospitalists with peer comparison

Providing primary care clinicians with individualized antibiotic prescribing feedback with comparison to peers is an evidence-based intervention to reduce unnecessary antibiotic use. In 2019, we extended this concept to the inpatient setting in a collaborative intervention with Hospital Medicine. We developed a data tool to give Hospitalist physicians and advanced practice providers individualized feedback on their use of vancomycin and antibiotics with a broad spectrum of gram-negative activity (anti-pseudomonal agents). As of October 2019, these two metrics are being fed back to the providers along with a comparison to their peers each quarter.

Program Goal

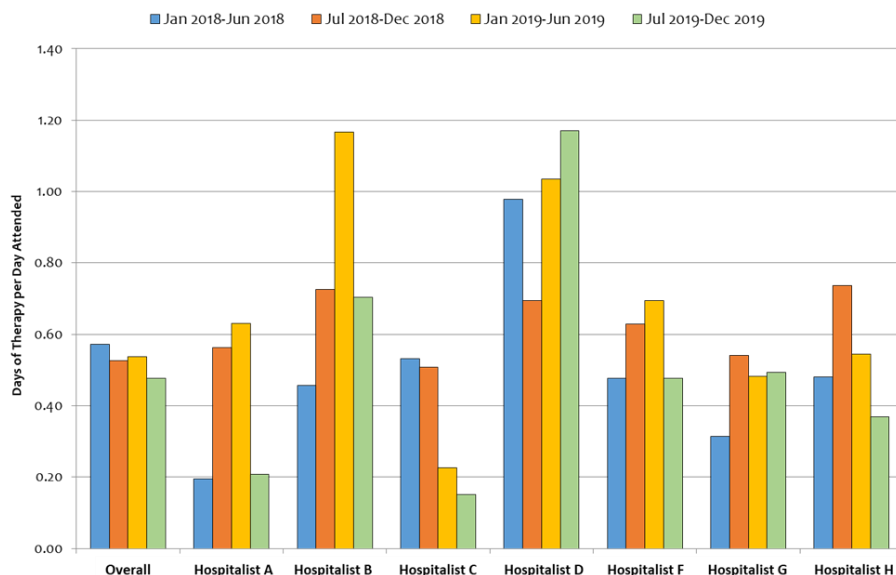
Improve antibiotic utilization among Hospitalists through regular, structured feedback regarding individual antibiotic use with peer comparison.

Outcomes

- With Hospital Medicine input, we successfully developed and operationalized metrics for individualized prescribing feedback – days of vancomycin and antipseudomonal antibiotics administered per day attended.
- We developed feedback reports to distribute to the Hospitalists on a quarterly basis. Each report contains the most recent 6 months of data with a comparison of the three previous 6-month periods as shown in the following figure. The variability in pre-prescribing, which this intervention aims to reduce, is apparent. For the purposes of this Annual Report only, the provider names were anonymized.

- As the intervention was only recently implemented, we plan to track total vancomycin and antipseudomonal use by the Hospitalists during 2020 to evaluate the effects of the intervention on prescribing behavior.

Figure 11.1-1: DHHA Days of Antipseudomonal Antibiotics Administered per Day Attended



*Data not shown for a given time period indicates the provider had zero days of therapy and/or zero days attended.

11.2. Other 2019 Achievements

- Denver Health continues to be designated as an Antimicrobial Stewardship Center of Excellence by the Infectious Diseases Society of America.
- A budget expansion request to continue the Infectious Diseases Pharmacy Residency beyond the initial grant-funded year was approved.
- Hospital-onset cases of *C. difficile* testing were reduced by 40%, largely through improved test ordering practices with the addition of clinical decision support in EPIC
- The penicillin skin testing program was successfully launched. To date, four patients with a reported penicillin allergy underwent penicillin skin testing. All were successfully de-labeled as penicillin allergic. At least three additional patients underwent a graded oral challenge and were de-labeled as penicillin allergic.
- A comprehensive assessment of antibiotic prescriptions in the Denver Health ambulatory care setting was completed which highlighted important areas of focus for outpatient antibiotic stewardship efforts.
- A manuscript was published identifying important areas to improve antibiotic use for acute otitis media in the Denver Health ambulatory care system.
- A Denver Health pilot grant was awarded to reduce excessive durations of antibiotic therapy for acute otitis media (principal investigator: Holly Frost, mentor: Tim Jenkins)
- A manuscript was published describing the results of a survey of Denver Health emergency department and urgent care clinicians regarding use and perceptions of the Denver Health antibiotic stewardship application. The application is widely utilized and perceived to be a valuable clinical resource.
- A manuscript was published with the results of a point prevalence study of antibiotic use across the Denver Health system.
- A poster was presented at a national Infectious Diseases conference on the use of dalbavancin to facilitate early hospital discharge for patients requiring prolonged inpatient antibiotic courses.
- The AS program participated in a hospital wide initiative to reduce the length of stay for community-acquired pneumonia, skin and soft tissue infections, and urinary tract infections.
- For antibiotic shortages, with careful inventory management and appropriate utilization, the AS Program avoided the need to implement alternative agent strategies or pharmacy automatic substitutions.

12.1. Appendix A: Glossary of Terms and Abbreviations

A-B

A1c.....Glycated Hemoglobin
ACS.....Ambulatory Care Services
AIDET.....Acknowledge, Introduce, Duration, Explanation, Thank you
AQA.....Ambulatory Quality and Accountability
AQIC.....Ambulatory Quality Improvement
AQIDC..... Ambulatory Quality Improvement and Design Committee
AHRQ.....Agency for Healthcare Research and Quality
ALTO.....Alternatives to Opioids
AMI.....Acute Myocardial Infarction
AMLOS.....Arithmetic Mean Length of Stay
API.....Application Programming Interface
APMs.....Advanced Alternative Payment Models
APP.....Advanced Practice Provider
APR-DRG.....All Patients Refined Diagnosis Related Groups
ARRA.....The American Recovery and Reinvestment act
AU.....Antibiotic Use
BBPE.....Blood borne Pathogen Exposure
BHO.....Behavioral Health Organization
BMI.....Body Mass Index
BNP.....Behavioral Natriuretic Peptide
BPA.....Best Practice Advisory

C

CABG.....Coronary Artery Bypass Graft
CAUTI.....Catheter-Associated Urinary Tract Infection
CDPHE.....Colorado Department of Health and Environment
CDC.....Centers for Disease Control and Prevention
CDI.....*Clostridioides difficile* infection
CDI.....Clinical Documentation Integrity
C. difficile.....*Clostridioides difficile* infection
CDS.....Clinical Decision Support
CDIS.....Clinical Documentation Integrity Specialist
CE.....Continuing Education
CGM.....Continuous Glucose Monitoring
CHG.....Chlorhexidine
CHORDS.....Colorado Health Observation Regional Data Service
CHS.....Community Health Services
CLABSI.....Central Line-Associated Blood Stream Infection
CMS.....Centers for Medicare and Medicaid Services
COMM.....Community
COPD.....Chronic Obstructive Pulmonary Disease
COSH.....Center for Occupational Safety and Health
CPOE.....Computerized Provider Order Entry
CQM.....Clinical Quality Measure
CRE.....Carbapenemase-producing enterobacteriaceae
CT.....Computed Tomography
CVD.....Cardiovascular Disease
CY.....Calendar Year

D

DHHA....Denver Health and Hospital Authority
DHMC.....Denver Health Medical Center
DI.....Deterioration Index

DKA.....Diabetic Ketoacidosis
DNR.....Do Not Resuscitate
DPSQ.....Department of Patient Safety and Quality
DRG.....Diagnosis Related Group

E-F

eCQM.....Electronic Clinical Quality Measure
ECCO.....Essentials of Critical Care Orientation
ECLS.....Extracorporeal Life Support
ECMO.....Extracorporeal Membrane Oxygenation
ED.....Emergency Department
EOP.....Emergency Operations Plan
EH.....Eligible Hospitals
eHH.....Electronic Hand Hygiene
EHR..... Electronic Health Record
EMP.....Emergency Management Plan
EMR.....Electronic Medical Record
EMS.....Emergency Medical Services
ENT.....Ear, Nose, and Throat
EOC.....Environment of Care
EOP.....Emergency Operations Plan
EP.....Eligible Provider
ESBL.....Extended Spectrum Beta Lactamases
EVS.....Environmental Services
EWS.....Early Warning System
FDA.....Food and Drug and Administration
FMEA.....Failure Modes and Effects Analysis
FOBT.....Fecal Occult Blood Test
FFP.....Fresh Frozen Plasma
FFS.....Fee for Service
FFY.....Federal Fiscal Year
FQHC.....Federally Qualified Healthcare Center

G-H

GI.....Gastrointestinal
HAC.....Hospital-Acquired Conditions
HAI.....Healthcare-Associated Infection
HANDI.....Tracking tool for Mass Vaccination Clinics
HAPI.....Healthcare-Acquired Pressure Injury
HBIPS.....Hospital-Based Inpatient Psychiatric Services
HCAHPS.....Hospital Consumer Assessment of Healthcare Providers and Systems
HCC.....Hierarchical Condition Category
HCPF.....Health Care Policy and Financing
HCW.....Healthcare Workers
HEDIS.....Hospital Effectiveness Data and Information Set
HEN.....Hospital Engagement Networks
HF.....Heart Failure
HH.....Hand Hygiene
HIT.....Health Information Technology
HI Team.....High Risk Infection Team
HLD.....High Level Disinfection
HQIP.....Hospital Quality Incentive Program
HR.....Human Resources
HTN.....Hypertension
HICS.....Hospital Incident Command Center
HIIN.....Hospital Improvement Innovation Network
HIM.....Health Information Management

I-L

ICU.....Intensive Care Unit
ICRA.....Infection Control Risk Assessments
ID.....Infectious Disease
IFU.....Instructions for Use
Inpt.....Inpatient
INR.....International Normalized Ratio
IP.....Inpatient
IP.....Infection Prevention
IPS.....Infection Preventionist
LTCF.....Long Term Care Facility
IPC.....Intermittent Pneumatic Compression
IPFQR.....Inpatient Psychiatric Facility Quality Reporting
IPF.....Inpatient Psychiatric Facility
IQR.....Hospital Inpatient Quality Reporting
IR.....Interventional Radiology
IV.....Intravenous
IVAC.....Infection-Related Ventilator-Associated Complications
Kg.....Kilogram
LLT.....Local Leadership Team
LOS.....Length of Stay
LOSI.....Length of Stay Index

M

MAR.....Medication Administration Record
MAT.....Medication Assisted Therapy
MCI.....Mass Casualty Incident
MDRO.....Multi-Drug Resistant Organisms
MICU.....Medical Intensive Care Unit
MIPS.....Merit-Based Incentive Payment Systems
MRI.....Magnetic Resonance Imaging
MRSA.....Methicillin-Resistant *Staphylococcus aureus* Bacteremia
MSPB.....Medicare Spending Per Beneficiary
MTP.....Massive Transfusion Protocol
MU.....Meaningful Use

N

N/A.....Not Applicable
NCQA.....National Committee for Quality Insurance
NDNQI.....National Database of Nursing Quality Indicators
NEC.....Necrotizing enterocolitis
NETEC.....National Ebola Training and Education Center
NHSN.....National Healthcare Safety Network
NICU.....Neonatal Intensive Care Unit
NPO.....nil per os
N-STEMI.....Non-ST-Elevation Myocardial Infarction

O

OBHS.....Outpatient Behavioral Health Services
OB/GYN.....Obstetrics and Gynecology
OBH.....Office of Behavioral Health
O/E.....Observed to Expected Ratio
OMFS.....Oral and Maxiofacial Surgery
OP.....Outpatient
OPPE.....Ongoing Professional Performance Evaluation
OPPS.....Outpatient Prospective Payment System
OQR.....Hospital Outpatient Quality Reporting
OR.....Operating Room

P

PC.....Perinatal Care Conditions
PCU.....Progressive Care Unit
PCMH.....Patient Centered Medical Home
PCR.....Polymerase Chain Reaction
PDMP.....Prescription Drug Monitoring Program
PEDUC.....Pediatric Emergency Department and Urgent Care
PERFORM..... Performance
PFS.....Progression-Free Survival
PI.....Promoting Interoperability
PI.....Performance Improvement
PICC.....Peripherally Inserted Central Catheter
PICU.....Pediatric Intensive Care Unit
PFAC.....Patient Family Advisory Council
PN.....Pneumonia
POA.....Present on Admission
PRBC.....Packed Red Blood Cells
PPE.....Personal Protective Equipment
PSCA.....Prostate Stem Cell Antigen
PSI.....Patient Safety Indicators
PSI 03.....Pressure Ulcer Rate
PSI 06.....Iatrogenic Pneumothorax
PSI 08.....In-Hospital Fall with Hip Fracture Rate
PSI 09.....Perioperative Hemorrhage or Hematoma rate
PSI 10.....Postoperative Acute Kidney Injury Requiring Dialysis rate
PSI 11.....Postoperative Respiratory Rate
PSI 12.....Perioperative Pulmonary Embolism or Deep Vein Thrombosis rate
PSI 13.....Post Operative Sepsis rate
PSI 14.....Postoperative Wound Dehiscence rate
PSI 15.....Unrecognized Abdominopelvic Accidental Puncture/Laceration Rate
P&T.....Pharmacy and Therapeutics Committee
PVAP.....Probably Ventilator Associated Pneumonia
PWID.....Persons Who Inject Drugs

Q

Q&A.....Quality and Accountability
QI.....Quality Improvement
QPP.....Quality Payment Program

R

RAE.....Regional Accountable Entities
RAF.....Risk Adjustment Factor
RBC.....Red Blood Cells
RHC.....Rural Health Clinic
RCCO/BHO.....Regional Care Collaborative / Behavioral Health Collaborative
RESPTC.....Regional Ebola and Other Special Pathogens Treatment Center
ROM.....Risk of Mortality
ROSC.....Return of Spontaneous Circulation

S

SAAR.....Standardized Antibiotic Administration Ratio
SEP.....Severe Sepsis/Septic Shock
SI.....Safety Intelligence
SIR.....Standardized Infection Ratio
SOI.....Severity of Illness

SPM.....Sterile Processing Management
SSI.....Surgical Site Infection
SSI-AbHyst.....Surgical Site Infection—Abdominal Hysterectomy
SSI-Colon.....Surgical Site Infection—Colon Surgery
SUR.....Standardized Utilization Ratio

T-U

TBD.....To Be Determined
TBI.....Traumatic Brain Injury
TCPI.....Transforming Clinical Practice Initiative
THA/TKA.....Elective Primary Total Hip or Knee Arthroplasty Complication Rate
TIN.....Tax Identification Number
TJC.....The Joint Commission
TOC.....Transitions of Care
TQIP.....Trauma Quality Improvement Program
US.....United States
UV.....Ultraviolet Light
UTI.....Urinary Tract Infection

V-Z

VAIC.....Vascular Access-Infusion Therapy Council
VAP.....Ventilator Associated Pneumonia
VAE.....Ventilator Associated Events
VBP.....Value-Based Purchasing
VLBW.....Very Low Birth Weight
VOC.....Voice of the Customer
VON.....Vermont Oxford Network
VRE.....Vancomycin-resistant enterococci
VRS/SA.....Vancomycin-resistant *Staphylococcus aureus*
VSA.....Lean Value Stream Analysis
VTE.....Venous Thromboembolism
WCC.....Well-Child Check
WHO.....World Health Organization
WPMC.....Winter Park Medical Center
WQ.....Work Queue

12.2 Appendix B: CONTACT INFORMATION AND ACKNOWLEDGEMENTS

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We are indebted to many Denver Health employees who work tirelessly to improve the quality and safety of our care on the front lines. Behind the scenes are many outstanding minds extracting, assimilating, analyzing, and presenting results that are included in this report. We would also like to thank our patients, from whom we continuously learn how to improve our care and how to drive to our goals of zero harm and high reliability.



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