2018 Denver Health Quality and Safety Annual Report

Quality of Care

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To the Denver Healthcare Community:

Our commitment to all the communities we serve is to provide high quality and safe care to those who seek better health across our integrated systems. To fulfill this commitment, we must continuously evaluate and improve our care. We are proud to present our 2018 Quality and Safety Annual Report. Our intent is to present a year-end summary of our quality and safety 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 to those seeking to better understand the complex landscape of 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.

- Tom, Allison, Mary Ann, Bryan, and Pence

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 2018 with significant reductions in hospital acquired conditions as measured by the enterprise metric Target Zero. Compared to 2017, DHHA experienced 8% fewer events, marking 3 consecutive years of reductions. Compared to 2015, DHHA experienced 40% fewer Target Zero Events, including 50% or more reductions in individual counts of CLABSI, CAUTI, Injury Falls, and Surgical Site Infections over the 3 year period.
- For the 3rd consecutive year of the CMS Readmissions Reduction Program, DHHA performed in the best quartile of participating U.S. hospitals with fewer than expected readmissions for COPD and Heart Failure.
- Despite improvements in 5 of the 6 domains of the CMS Hospital Acquired Conditions Reduction program, DHHA was penalized 1% of Medicare FFS inpatient payments for the 4th consecutive year, reflecting higher than expected rates of selected patient safety indicators.
- For the 2nd time in the 7 years of the CMS Value Based Purchasing program, DHHA earned back more than the withhold resulting in a 0.2% incentive bonus on Medicare FFS hospital payments.
- DHHA has vaccinated >98% of all employees/contractors against seasonal influenza every year since the 2011-2012 influenza season.
- The ACUTE Center for Eating Disorders was the first medical unit to receive Anthem Health's Center of Excellence designation in the field of eating disorders.
- DHHA's Target Zero program received a 2018 Gage Award Honorable Mention in the Quality category from America's Essential Hospitals.
- DHHA was named as one of only 25 hospitals in the U.S. designated as an Antimicrobial Stewardship Center of Excellence by the Infectious Diseases Society of America (IDSA).
- DHHA established a multidisciplinary Center for Addiction Medicine in 2018.
- In 2018, DHHA received a Bariatric Care Center of Excellence designation from the American Society for Metabolic and Bariatric Surgery.
- For the first 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.
- CMS Overall Hospital Quality Rating improved to 3 stars
- Hand washing performance achieved its highest level in history at 88% for the 4th quarter of 2018 and 2018 was best year ever.
- For the second year in a row, DHHA had zero early elective deliveries between 37-39 weeks gestation.
- A DHHA record of 56% of newborns were exclusively fed breast milk during their inpatient stay.
- For the Colorado Medicaid Hospital Quality Improvement Program (HQIP), DHHA received a record 80% of eligible points across the domains of culture of safety, behavioral health collaboration, discharge planning, and breast feeding practices, resulting in a $7.5M incentive payment.
- After a series of focused inter-professional quality improvement efforts by the inpatient diabetes management team, DHHA reduced the frequency of severe hypoglycemia events from 79 per 1000 patients in a baseline period 2014-2016 to 30 per 1000 patients in 2018.
- Resulting from multifaceted interventions and relentless attention to prevention, DHHA experienced 38% and 28% reductions in total and injury falls per 1000 patient-days, respectively, from 2016 to 2018.
- The clinical teams in ambulatory care services achieved predetermined threshold, target, or stretch goals in 8 of 11 clinical quality measures, resulting in an ambulatory bundle measure exceeding the target for 2018.
- The prevalence of cigarette smoking among DHHA patients reached an all time low of 19.3% in 2018.

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1. PUBLIC REPORTING & INCENTIVES
1.1. CMS Hospital Readmissions Reduction Program—FFY2019

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. This year marks the first time CMS implemented a socio-demographic status adjustment.

- 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 $425,000 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 –0.05% for FFY 2019 discharges, which is estimated as a $6,500 loss (Figure 1.1).
  - ◊ DHHA ranked in the best quartile of hospitals nationwide.

- **PI Activities**
  - ◊ Continuation of an enterprise-wide patient flow initiative with executive oversight targeting all aspects of patient flow.

| | **0% reduction** | | **0.02% reduction** | | **0.05% reduction** | |

Figure 1.1: CMS Hospital Readmissions Reduction Program

	FFY 2017		FFY 2018		FFY 2019	
Performance Period	7/1/12—6/30/15		7/1/13—6/30/16		7/1/14—6/30/17	
Condition	Number of Eligible Discharges	Excess Readmission Ratio	Number of Eligible Discharges	Excess Readmission Ratio	Number of Eligible Discharges	Excess Readmission Ratio
Acute Myocardial Infarction	44	0.9756	43	1.0203	42	1.0524
Chronic Obstructive Pulmonary Disease	60	0.9623	48	0.9659	48	0.9853
Heart Failure	78	0.9529	93	0.9752	85	0.9569
Pneumonia	79	0.9360	85	0.9735	70	1.0273
Total Hip and Total Knee Arthroplasty	14	1.0259	14	1.0837	15	1.0233
Coronary Artery Bypass Graft Surgery	N/A	N/A	0	N/A	0	N/A
Financial Impact	$0		- $2,833		-$6,500*	

*Estimated

1.2. CMS Hospital-Acquired Conditions (HAC) Reduction Program—FFY 2019

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.

- Patient Safety Domain — Agency for Healthcare Research and Quality (AHRQ) Patient Safety and Adverse Events Composite measure is a 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 8.0 (recalibrated) of the AHRQ PSI software, and hospitals' Medicare FFS claims for discharges during the performance period. The domain time period is limited to 21-months to account for the implementation of ICD-10.

Figure 1.2-1: Patient Safety and Adverse Events Composite
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

- Healthcare-Associated Infections (HAI) Domain—Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) uses chart-abstracted surveillance data reported by our Infection Prevention department. Standardized infection ratios (SIRs) provide risk-adjustment at hospital- and patient-care unit level.

- **Financial Impact**
  - ◊ 1% maximum payment reduction in FFY 2019 if total HAC Score above 75th percentile (i.e. 0.3429).
  - ◊ 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 in lowest performing quartile for fourth year (Figures 1.2-2 and 1.2-3).
  - ◊ Projected reimbursement reduction for FFY 2019 is -$300,000.

- **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.

- **Future Impact**
  - ◊ FFY 2020: Patient Safety domain returns to a full 24-month time period.

Figure 1.2-2: CMS Hospital-Acquired Conditions Reduction Program FFY 2019

	Result	Winsorized-Z score
Patient Safety Domain (15% of score) Performance period 10/1/15—6/30/17		
AHRQ PSI 90 Composite	0.975	- 0.101
Healthcare-Associated Infections Domain (85% of score) Performance period 1/1/16—12/31/17		
Central Line-Associated Bloodstream Infection (CLABSI) SIR	1.183	0.697
Catheter-Associated Urinary Tract Infection (CAUTI) SIR	1.223	0.613
Surgical Site Infection - colon and abdominal hysterectomy SIR	1.496	1.248
Methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia SIR	0.851	- 0.018
Clostridium difficile infections SIR	0.992	0.498
Total HAC Score		**0.5015**

Better

Payment Reduction Threshold = 0.3429

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	- $300,000*

*Estimated

1.3. CMS Quality Payment Program (QPP)—FFY 2020

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 100 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). The performance threshold to avoid a penalty increases from 3 points in 2017 to 15 points in 2018 to 30 points in 2019. As the program progresses, the the weight of the Quality Performance Category decreases in order to shift weight to the Cost Performance Category. Advancing Care Information was renamed Promoting Interoperability in 2018. The MIPS maximum payment adjustment began at +/- 4% in FFY 2019 and increases to +/- 9% for FFY 2022 and beyond (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 　Promoting Interoperability† 　Improvement Activities 　Cost	70% 25% 15% 0%	50% 25% 15% 10%	45% 25% 15% 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
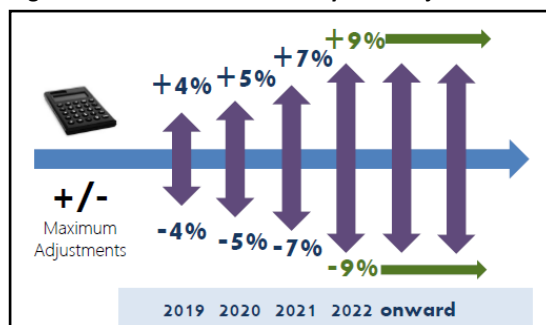
Source: CMS

1.3. CMS Quality Payment Program (QPP)—FFY 2020

CMS released preliminary performance feedback to group practices in April 2019 (Figure 1.3-3). DHHA received 95 out of 100 points and qualified for the Exceptional Performance Bonus. The Cost Performance Category results will be released by CMS in the summer of 2019 and it is worth 15 points. DHHA is expected to receive a 100% on the MIPS program.

- **Financial Impact**
  - ◊ Between 5.5% to 15% positive 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 2020 —Denver Health Group Practice Submission

Quality (50%)

Quality ID	NQF ID	CMS eCQM	Measure	Performance Rate	Performance Points*	Bonus Points	Category Score†
066	—	146v6	Appropriate Testing for Children with Pharyngitis	92.3%	10	2^{H,E}	
111	0043	127v6	Pneumococcal Vaccination Status for Older Adults	77.91%	9.3	1^{E}	71.3 achieved = 60 possible
192	0564	132v6	Cataracts: Complications within 30 days Following Cataract Surgery Requiring Additional Surgery	0%	10	1^{E}	
239	0024	155v6	Weight Assessment and Counseling for Nutrition and Physical Activity for Children & Adolescents	76.35%	10	1^{E}	
310	0033	153v6	Chlamydia Screening for Women	66.65%	10	1^{E}	119%*50 weight = 59.5—> 50 max
379	—	74v7	Primary Caries: Prevention Intervention as Offered by Primary Care Providers, including Dentists	27.91%	10	1^{E}	
001	0059	122v6	Diabetes: Hemoglobin A1c Poor Control (>9%)	32.64%	n/a	2^{H}	**50**
065	0069	154v6	Appropriate Treatment for Children with Upper Respiratory Infection	97.89%	n/a	1^{H}	
373	—	65v7	Hypertension: Improvement in Blood Pressure	34.59%	n/a	2^{H}	

Promoting Interoperability (25%)

Measure	Performance	Base Score	Performance Points	Bonus Points	Category Score
Security Risk Analysis	Completed	Achieved	n/a	n/a	Base: 50
E-Prescribing	93.0% (556,830 / 599,029 prescriptions)	Achieved	n/a	n/a	Perform: 62
Provide Patient Access to View, Download, and Transmit	90.8% (166,155 / 183,008 patients)	Achieved	20/ 20	n/a	Bonus: 5
Health Information Exchange	39.9% (5500 / 13,793 outbound transitions of care)	Achieved	8 / 20	n/a	
Patient-Specific Education	96.4% (175,601 / 182,207 patients)	n/a	10 / 10	n/a	50 + 62 + 5 = 100 possible
View, Download, or Transmit	20.4% (37,282 / 183,008 patients)	n/a	2 / 10	n/a	
Secure Messaging	18.3% (33,549 / 183,008 patients)	n/a	2 / 10	n/a	117%*25 weight =
Medication Reconciliation	92.7% (399,987 / 431,487 inbound transitions of care)	n/a	10 / 10	n/a	29.3 —> 25 max
Immunization Registry Reporting	Active engagement with public health agency	n/a	10 / 10	n/a	
Specialized Registry Reporting	Active engagement with registry	n/a	n/a	5	**25**

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	200 achieved = 40 possible
Collection and Follow-up on Patient Experience and Satisfaction Data on Beneficiary Engagement	High	40	n/a	
Engage Patients and Families to Guide Improvement in the System of Care	High	40	n/a	
Regularly Assess the Patient Experience of Care Through Surveys, Advisory Councils and/or Other Mechanisms	Medium	20	n/a	5*15 weight= 75 —> 15 max
Transforming Clinical Practice Initiative (TCPI) Participation	Medium	20	n/a	
RHC, HIS or FQHC Quality Improvement Activities	High	40	n/a	**15**

Cost (10%)

Measure	Performance Rate	Performance Points	Bonus Points	
Medicare Spending per Beneficiary	TBD	TBD	n/a	TBD with max score of 10
Total per Capita Cost	TBD	TBD	n/a	

Additional Bonus for Complex Patients			n/a	n/a	5	**5**

OVERALL SCORE = (50 + 25 + 15 + cost score + 5 bonus) / 100 = 95% 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 Program (VBP)—FFY 2019

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. For the FFY 2019 program, CMS added Elective Primary Total Hip/Total Knee Arthroplasty Complication Rate, removed AHRQ PSI-90, and updated CLABSI and CAUTI measures to include non-intensive care unit (ICU) locations.

- ■ **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 0.20% incentive for FFY 2019 discharges, which is estimated as a $29,000 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 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 added to program.
    - ◊ FFY 2023: Modified AHRQ PSI-90 (Patient Safety & Adverse Event Composite) added to program.

Figure 1.4-1: CMS Hospital Value-Based Purchasing Program (VBP) - FFY 2019

Clinical Care Domain (25%) Data Source: CMS Claims		Baseline Rate (Mortality 7/1/09-6/30/12 THA/TKA 7/1/10-6/30/13)	Performance Rate (Mortality 7/1/14-6/30/17 THA/TKA 1/1/15-6/30/17)	Achievement Threshold	Points*	Domain Points
MORT-30-AMI	Acute Myocardial Infarction (AMI) 30-Day Mortality Rate	0.852	0.873	0.851	9 (A)	
MORT-30-HF	Heart Failure (HF) 30-Day Mortality Rate	0.892	0.885	0.883	1 (A)	
MORT-30-PN	Pneumonia (PN) 30-Day Mortality Rate	0.878	0.895	0.882	5 (I/A)	**15 / 30**
THA/TKA	Elective Primary Total Hip Arthroplasty/Total Knee Arthroplasty Complication Rate	0.035	0.023	0.032	—	
Patient & Caregiver Centered Experience of Care / Care Coordination Domain (25%) Data Source: HCAHPS		**Baseline Rate** (01/01/15-12/31/15)	**Performance Rate** (01/01/17-12/31/17)	**Achievement Threshold**	**Points***	**Domain Points**
Communication with Nurses		76.2%	75.0%	78.7%	0	
Communication with Doctors		78.6%	77.8%	80.3%	0	
Responsiveness of Hospital Staff		58.4%	60.2%	65.2%	0	**2 / 80 for metrics**
Communication about Medicines		66.9%	62.3%	63.3%	0	
Hospital Cleanliness and Quietness		62.8%	59.8%	65.6%	0	
Discharge Information		87.2%	87.4%	87.1%	1 (A)	**16 / 20 for consistency**
Care Transition		46.0%	46.8%	51.4%	0	
Overall Rating of Hospital		69.8%	71.3%	70.9%	1 (I/A)	
HCAHPS Consistency (based on Responsiveness of Hospital Staff)		*58.4%*	*60.2%*	n/a	16	
Safety Domain (25%) Data Source: CDC NHSN Standardized Infection Ratio and CMS Core Measures		**Baseline Rate** (01/01/15-12/31/15)	**Performance Rate** (01/01/17-12/31/17)	**Achievement Threshold**	**Points***	**Domain Points**
CAUTI	Catheter-Associated Urinary Tract Infection	1.438	1.000	0.822	3 (I)	
CLABSI	Central Line-Associated Blood Stream Infection	1.931	0.888	0.860	5 (I)	
CDI	*Clostridium difficile* Infection	1.173	0.810	0.924	3 (I)	
MRSA	Methicillin-Resistant *Staphylococcus aurerus* Bacteremia	0.576	0.174	0.854	8 (A)	**34 / 60**
SSI-AbdHyst	Surgical Site Infection—Abdominal Hysterectomy	—	—	0.762	—	
SSI-Colon	Surgical Site Infection—Colon Surgery	2.549	1.051	0.783	5 (I)	
PC-01	Elective Delivery Prior to 39 Completed Weeks Gestation	0.016	0.000	0.010	10 (A)	
Efficiency and Cost Reduction Domain (25%) Data Source: CMS Claims		**Baseline Rate** (01/01/15-12/31/15)	**Performance Rate** (01/01/17-12/31/17)	**Achievement Threshold**	**Points***	**Domain Points**
MSPB-1	Medicare Spending per Beneficiary	0.951	0.947	0.987	3 (A)	**3 / 10**

OVERALL SCORE = 25(15/30) + 25(18/100) + 25(34/60) + 25(3/10) = 38.7

(A) Achievement score higher. (I) Improvement score higher. (—) minimum case requirements not met.
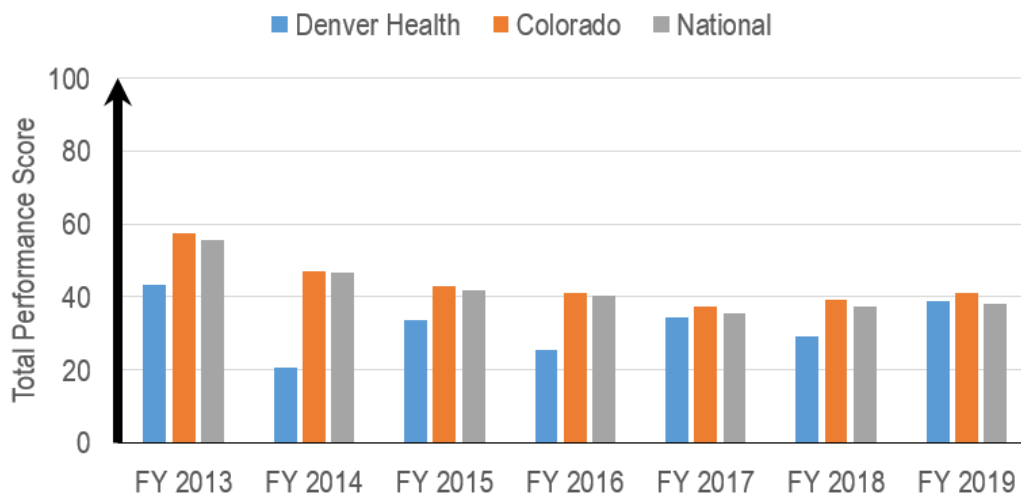
1.4. CMS Hospital Value-Based Purchasing Program (VBP)—FFY 2019

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. For the first time, DHHA surpassed the national average score and substantially closed the gap with the state average score in the FFY 2019 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 $26,000 in FFY 2019 (Figure 1.4-3).

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

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%	$26,000*

* 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 (EP) 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 Modified Stage 2 of the programs in 2018.

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 (AIU)."

- ■ **Financial Impact**
  - ◊ DHHA has received incentive payments of approximately $27.9 million from the EHR Incentive Program, with nearly $12 million for the Eligible Hospital program and $16 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	$1,870,000*
Total Payment	$2,907,104	$9,003,008	n/a	$17,879,750
Total Payment by Program	**$11,910,112**		**$17,879,750**	
Overall Financial Impact	**$29,789,862**			

*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 2018. Performance on the objective measures is shown in Figure 1.5-2 and performance on the clinical quality measures is shown in Figure 1.5-3.

Figure 1.5-2: Medicare Eligible Hospital Promoting Interoperability Program Objective Measures

Modified Stage 2 Objectives	Threshold	Program Year 2016*	Program Year 2017†	Program Year 2018‡	
Protect Electronic Health Information	Yes	Yes	Yes	Yes	
E-Prescribing	>10%	90.6%	82.4%	83.9%	9,441 of 11,260 Discharge Prescriptions
Send Summaries of Care	>10%	48.1%	53.0%	22.5%	1,382 of 6,150 Transitions
Patient-Specific Education	>10%	97.3%	99.6%	98.3%	5,197 of 5,286 Patients
Medication Reconciliation	>50%	90.4%	93.4%	89.5%	5,871 of 6,562 Transitions
Patient Electronic Access to Health Information					
Measure 1: Patient Electronic Access	>50%	98.6%	98.8%	98.2%	5,183 of 5,278 Patients
Measure 2: Patients Access Health Information	>1 patient	15.5%	17.9%	21.7%	1,144 of 5,278 Patients
Public Health Reporting (Need 3 of 4)					
Immunization Registry Reporting		Yes	Yes	Yes	
Syndromic Surveillance Reporting	Meet 3 of 4 measures	Yes	n/a	Yes	
Specialized Registry Reporting		Yes	Yes	Yes	
Reportable Laboratory Result Reporting		Yes	Yes	Yes	

*Reporting period is 10/1/2016—12/31/2016. †Reporting period is 1/1/2017—3/31/2017. ‡Reporting period is 9/30/2018—12/28/2018.

Figure 1.5-3: Medicare Eligible Hospital EHR Incentive Program Clinical Quality Measures

Measure ID	Electronic Clinical Quality Measure	Program Year 2018*
eEHDI-1a	Hearing Screening Prior to Hospital Discharge	98.5% (794/806)
eED-2	Time from Admit Decision to ED Departure for Admitted Patients	102 minutes (N=2763)
eSTK-6	Stroke Patients Discharged on Statin Medication	85.7% (12/14)
eVTE-1	Venous Thromboembolism Prophylaxis	90.6% (1252/1382)

* Reporting period is Q4 2018

- ■ **Future Impact**
  - ◊ CMS has updated the PI Stage 3 Objectives and Measures required for the 2019 Medicare program
    - • Objective 1: Electronic Prescribing
      - ♦ E-prescribing discharge medications
      - ♦ Bonus: Query of Prescription Drug Monitoring Program (PDMP)
      - ♦ Bonus: Verify Opioid Treatment Agreement
    - • Objective 2: Health Information Exchange
      - ♦ Support electronic referral loops by sending health information (create summary of care and send out)
      - ♦ Support electronic referral loops by receiving and incorporating health information (clinical information reconciliation for medication, allergy, and problem list)
    - • Objective 3: Provider to Patient Exchange
      - ♦ Provide patients with timely access to health information to view online, download and transmit to a third party and to access using an application of their choice
    - • Objective 4: Public Health and Clinical Data Exchange
  - ◊ eCQMs will be reported using Clinical Quality Language (CQL) logic, thereby improving the accuracy and clarity of eCQMs
  - ◊ Scoring methodology changed from threshold-based to performance-based scoring system

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 2018 results are estimated. For each provider, a 90-day period was identified where the EP met the thresholds of all objective measures. Six eCQMs which are related to the EP's scope of practice were submitted. Figure 1.5-4 shows the percentage of providers compliant with each objective measure. Figure 1.5-5 shows the percentage of patients or encounters passing each quality measure during Q4 2018. This is preliminary data because providers who fail an objective measure in Q4 2018 may pass all objective measures in another 90-day period. Furthermore, eligibility for the 2018 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 220 EPs will attest to Modified Stage 2 for program year 2018, resulting in incentive payments of $1,870,000.

Figure 1.5-4: Medicaid Eligible Provider EHR Incentive Program Objective Measures

Modified Stage 2 Objectives	Threshold	Program Year 2017 Compliant Providers*	Program Year 2018 Compliant Providers**
Protect Patient Health Information	Yes	100% (493/493)	100% (461/461)
Clinical Decision Support (CDS)			
Measure 1: Implement CDS Interventions	5 CDS	100% (493/493)	100% (461/461)
Measure 2: Implement Drug-Drug & Drug-Allergy Checks	Yes	100% (493/493)	100% (461/461)
Computerized Provider Order Entry			
Measure 1: CPOE—Medications	>60% orders	99.8% (492/493)	99.8% (460/461)
Measure 2: CPOE—Labs	>30% orders	99.8% (492/493)	100% (461/461)
Measure 2: CPOE—Imaging	>30% orders	100% (493/493)	100% (461/461)
Electronic Prescribing	>50% prescriptions	99% (490/493)	99.8% (460/461)
Health Information Exchange—electronically transmit Summary of Care to receiving provider for each transition of care or referral	>10%	100% (493/493)	100% (461/461)
Patient Specific Education	>10%	100% (493/493)	100% (461/461)
Medication Reconciliation—performed for patients transitioned into the EP's care	>50%	98% (488/493)	98% (452/461)
Patient Electronic Access			
Measure 1: Patients provided electronic access to View, Download, or Transmit their information within 4 business days of the information being available to the provider	>50%	77% (381/493)	100% (461/461)
Measure 2: Patients access their health information	>5%	63% (312/493)	94% (432/461)
Secure Messaging	>5%	84% (417/493)	80% (368/461)
Public Health Reporting: Immunization Registry, Syndromic Surveillance, Specialized Registry	2 registries	100% (493/493)	100% (461/461)

*Reporting period is 10/1/2017—12/31/2017. **Preliminary results based on 10/1/2018—12/31/2018.

- **PI Activity**
  - ◊ Enterprise-wide efforts to encourage patients to sign up for MyChart and access their information.
  - ◊ Individualized provider education if not meeting threshold of objective measure.

- **Future Impact**
  - ◊ CMS chose not to overhaul the Stage 3 Objectives for the Medicaid PI program because this would put an undue burden on each state's Medicaid program. Therefore, the measures and objectives finalized in the 2015 EHR Incentive Program Final Rule will be used for attesting to Medicaid.
  - ◊ Successful participation remains the same, i.e. meet the threshold for all objective measures and submit eCQMs. However, the thresholds increase in 2019 for almost every measure.
  - ◊ DHHA will be required to report on four new measures in 2019 as part of the Stage 3 program:
    - Patient's health information is available for the patient to access using any application of their choice that is configured to meet the technical specifications of Epic's Application Programming Interface (API)
    - Patient generated health data or data from a non-clinical setting is incorporated into Epic
    - Incorporate external summary of care reports into Epic
    - Conduct clinical information reconciliation which includes medication reconciliation, medication allergy, and current problem list

1.5. CMS Promoting Interoperability (PI) Programs

Medicaid Eligible Provider Meaningful Use Program

Figure 1.5-5: Medicaid Eligible Provider EHR Incentive Program Clinical Quality Measures for Quarter 4 2018 Encounters

Domain	CMS ID	Measure Name	Numerator	Denominator	Compliance
Efficiency and Cost Reduction	146	Appropriate Testing for Children with Pharyngitis	636	669	95%
	154	Appropriate Treatment for Children with Upper Respiratory Infection	1483	1511	98%
Patient Safety	68	Documentation of Current Medications in the Medical Record	32,354	38,218	85%
	132	Complications within 30 Days Following Cataract Surgery Requiring Additional Surgical Procedures	0	63	0%
	156	Use of High-Risk Medications in the Elderly: One Medication	474	6289	8%
		Use of High-Risk Medications in the Elderly: Two Medications	171	6289	3%
Community and Population Health	138	Tobacco Use: Tobacco Screening	28,331	28,679	99%
		Tobacco Use: Cessation Intervention for Tobacco Users	2165	6137	35%
		Tobacco Use: Tobacco Screening and Cessation Intervention for Tobacco Users	24,364	28,679	85%
	147	Influenza Immunization	25,151	44,369	57%
	153	Chlamydia Screening: Women 16-20 years of age	1727	2395	72%
		Chlamydia Screening: Women 21-24 years of age	1954	2686	73%
	155	Weight Assessment & Counseling: Age 3-11 years old—BMI Percentile, Height, & Weight	9764	10,545	93%
		Weight Assessment & Counseling: Age 3-11 years old—Counseling for Nutrition	8036	10,545	76%
		Weight Assessment & Counseling: Age 3-11 years old—Counseling for Physical Activity	7110	10,545	67%
		Weight Assessment & Counseling: Age 12-17 years old—BMI Percentile, Height, & Weight	8147	8656	94%
		Weight Assessment & Counseling: Age 12-17 years old—Counseling for Nutrition	6334	8656	73%
		Weight Assessment & Counseling: Age 12-17 years old—Counseling for Physical Activity	6007	8656	69%
Effective Clinical Care	65	Hypertension Improvement in Blood Pressure	1325	2348	56%
	74	Primary Caries Prevention Intervention: 0-5 years old	7105	12,679	56%
		Primary Caries Prevention Intervention: 6-12 years old	2570	9942	26%
		Primary Caries Prevention Intervention: 13-20 years old	996	10,754	9%
	75	Children Who Have Dental Decay or Cavities	3250	33,375	10%
	122	Diabetes Hemoglobin A1C Poor Control	2218	7619	29%
	125	Breast Cancer Screening	5289	8495	62%
	127	Pneumococcal Vaccination Status for Older Adults	5060	6221	81%
	130	Colorectal Cancer Screening	9045	17,174	53%
	134	Diabetes: Medical Attention for Nephropathy	6884	7619	90%
	137	Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 13-17, initiated treatment	11	99	11%
		Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 13-17, multiple services	4	99	4%
		Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 18 & older, initiated treatment	114	2972	4%
		Initiation/Engagement of Alcohol & Drug Dependence Treatment: Ages 18 & older, multiple services	15	2972	1%
	144	Heart Failure: Beta-Blocker Therapy for Left Ventricular Systolic Dysfunction	8	9	89%
	164	Ischemic Vascular Disease: Use of Aspirin or Another Antithrombotic	1232	1546	80%
	165	Controlling High Blood Pressure	6000	10,781	56%
Person/Caregiver Experience	157	Oncology: Pain Intensity Quantified	117	137	85%

- **PI Activity**
  - ◊ See Section 5 (Outpatient Safety and Quality Initiatives) for detailed information

- **Future Impact**
  - ◊ CY 2019: CMS retired two eCQMs which DHHA previously reported (65, 164).

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 2020 payment determination is based on the CY 2018 reporting period. There were 31 required measures (6 chart-abstracted, 14 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 1.5-3, DHHA submitted cases from Q4 2018 for eED-2, eEHDI-1, eSTK-6, and eVTE-1.

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 randomly selected for the FFY 2020 IQR Inpatient Data Validation program. Clinical process of care measure sets included Emergency Department (ED), Immunization (IMM), Sepsis (SEP), and Venous Thromboembolism (VTE). Central Line-Associated Bloodstream Infection (CLABSI) and Catheter-Associated Urinary Tract Infection (CAUTI) events reported to NHSN were validated along with Surgical Site Infection (SSI) cases from Medicare claims data for patients who had colon surgeries or abdominal hysterectomies. A CMS contractor validated 18 medical charts per quarter for Q3 2017, Q4 2017, Q1 2018, and Q2 2018. **DHHA passed validation with an overall reliability of 94%**.

- ■ **Future Impact**
    - ◊ CY 2019: CMS is removing five measures (ED-1, IMM-2, VTE-6, MORT-30-COPD, MORT-30-PN).
    - ◊ CY 2020: CMS is removing 14 measures (ED-2, CAUTI, CDI, CLABSI, SSI, MRSA, MORT-30-CABG, eAMI-8a, eCAC-3, eED-1, eEHDI-1a, ePC-01, eSTK-8, eSTK-10).
    - ◊ CY 2021: CMS is removing one measure (COMP-HIP-KNEE).

The Joint Commission ORYX Initiative

The Joint Commission's (TJC) ORYX initiative integrates outcomes and other performance measures into the accreditation process. In 2018, DHHA was required to submit nine chart-abstracted measures and four of 13 available eCQMs. Some of the chart-abstracted measures aligned with the CMS IQR program (ED-1, ED-2, PC-01, VTE-6, and IMM-2). However, TJC required four additional perinatal care measures (PC-02, PC-03, PC-04, and PC-05). Chart-abstracted measures are reported for the entire year whereas the eCQM measures are reported for a self-selected quarter in 2018. In order to learn as much as possible about the eCQM process, DHHA submitted six eCQMs (eED-1, eED-2, eEHDI-1, eSTK-6, eVTE-1, eVTE-2). DHHA chose to report Q4 2018. Hospitals that fail to participate will lose their accreditation.

- ■ **Future Impact**
    - ◊ TJC removed ED-1, VTE-6, and IMM-2 as required chart-abstracted measures in 2019.
    - ◊ TJC added a new mandatory perinatal care measure (PC-06 Unexpected Complications in Term Newborns).
    - ◊ DHHA has not decided which eCQMs to report to TJC in 2019.

1.6. CMS/The Joint Commission Clinical Quality Measures

Hospital Inpatient

Influenza Immunization (IMM)
Influenza Immunization (IMM-2) was a mandatory chart-abstracted measure in 2018 for CMS IQR and TJC ORYX programs.

■ **Results**
- ◊ During the 2017-2018 flu season, 99.6% of patients had documentation of influenza vaccine status (contraindication, receipt or refusal of vaccine during the current admission, or receipt prior to current admission).
- ◊ During the first half of 2018-2019 flu season (Q4 2018), 99.6% of patients had documentation of influenza vaccine status.

■ **PI Activity**
- ◊ Epic Inpatient Clinical Documentation Team updated the real-time, unit-specific worklists which showed patient-level status of vaccination screening, administration, and discharge order. This worklist facilitated DPSQ staff to provide immediate feedback to specific units with potential failed cases.
- ◊ 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.
- ◊ DPSQ reported weekly on previous 7-day performance at the Daily Patient Safety Briefing.

■ **Future Impact**
- ◊ CY 2019: CMS and TJC retired IMM-2, thereby eliminating the hospital-wide immunization measure.

Stroke (STK)
Discharged on Statin Medication (eSTK-6) was selected as an eCQM for the CMS IQR and TJC ORYX programs.

■ **Results**
- ◊ 86% of stroke patients were discharged on a statin medication during Q4 2018 (eSTK-6).

Venous Thromboembolism (VTE)
Incidence of Potentially Preventable VTE (VTE-6) was a mandatory chart-abstracted measure for CMS IQR and TJC ORYX programs.
Venous Thromboembolism Prophylaxis (eVTE-1) was selected as an eCQM for CMS IQR and TJC ORYX programs.
Intensive Care Unit Venous Thromboembolism Prophylaxis (eVTE-2) was selected as an eCQM for TJC ORYX program.

■ **Results**
- ◊ 0% of patients who did not receive VTE prophylaxis developed a VTE during hospitalization in 2018 (VTE-6).
- ◊ DHHA's last potentially preventable VTE occurred in Q2 2014.
- ◊ 90.6% of patients received venous thromboembolism prophylaxis during Q4 2018 (eVTE-1).
- ◊ 97.6% of ICU patients received venous thromboembolism prophylaxis during Q4 2018 (eVTE-2).

■ **PI Activity**
- ◊ DPSQ, Epic teams, and VTE physician champions collaborated to update/modify the inpatient prophylaxis order set.

■ **Future Impact**
- ◊ CY 2019: CMS and TJC retired VTE-6, thereby eliminating all VTE chart-abstracted measures.

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 2018 for the CMS IQR program and publicly reported on Hospital Compare.

- **2018 Results**
  - ◊ 48.7% of patients passed all applicable measure components in the Sepsis Composite (compared to 43% in 2017).

Figure 1.6-1: Early Management Bundle: Severe Sepsis / Septic Shock (SEP-1)
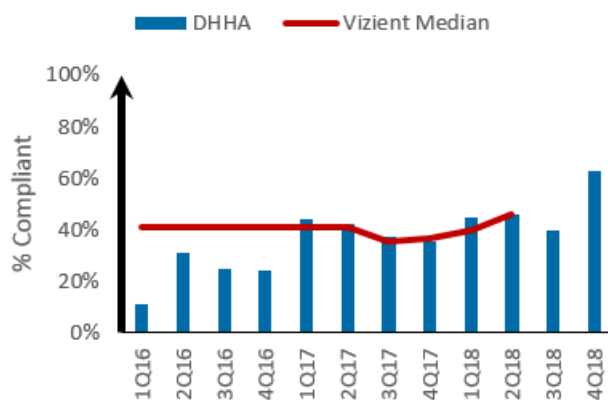
- **PI Activity**
  - ◊ Emergency Pharmacist added to receive Sepsis Zip It Notifications
  - ◊ CDI team worked to standardize the definition of sepsis for documentation and coding purposes
  - ◊ Re-measure lactate process improvement looked at by Epic leadership and Value Stream Analysis (VSA) in May
  - ◊ Implementation of nursing BPA in Emergency Department (ED) based on fever and tachycardia to encourage nurses to initiate the sepsis standing order
  - ◊ Sepsis order sets updated to match Antibiotic Stewardship recommendation
  - ◊ Inpatient sepsis order set modified for enhanced clarity and increased compliance
  - ◊ Revision of nurse standing order in ED to include allowance of nurse to initiate full 30 cc/kg fluid
  - ◊ Real time screens of septic shock cases in the ED sent to ED Leadership weekly
  - ◊ ED Leadership provided monthly reports on Septic Shock compliance
  - ◊ ED Residents and Attendings received sepsis case feedback by ED leadership
  - ◊ Yearly 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

- **Future Impact**
  - ◊ CY 2019: SEP-1 will remain a mandatory chart abstracted measure for CMS IQR program.
  - ◊ Attending physicians in the ED will be held accountable for the care of septic shock patients via the OPPE process.

1.6. CMS/The Joint Commission Clinical Quality Measures

Hospital Inpatient

Perinatal Care Conditions (PC)

Elective Delivery (PC-01) was a mandatory chart-abstracted measure in 2018 for the CMS IQR program. The Perinatal Care measure set must be chart-abstracted for the 2018 TJC ORYX program. This included Elective Delivery (PC-01), Cesarean Section (PC-02), Antenatal Steroids (PC-03), Health Care-Associated Bloodstream Infections in Newborns (PC-04), and Exclusive Breast Milk Feeding (PC-05). Hearing Screening Prior to Hospital Discharge (eEHDI-1a) was selected as an eCQM for CMS IQR and TJC ORYX programs.

- ■ **2018 Results**
  - ◇ 0% of pregnant women had an elective delivery between 37 and 39 weeks gestation (PC-01).
  - ◇ 19% 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).
  - ◇ 3% of high risk newborns diagnosed with septicemia or bacteremia acquired their infection in the hospital (PC-04).
  - ◇ 56% of newborns were exclusively fed breast milk during the inpatient stay following birth (PC-05).
  - ◇ 99% of newborns received a hearing screening prior to hospital discharge during Q4 2018 (eEHDI-1a).
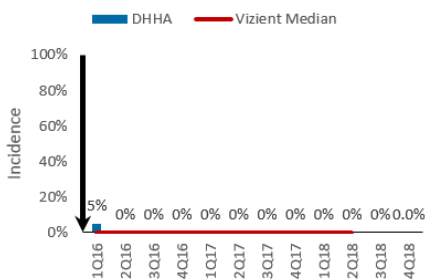
Figure 1.6-2: Elective Delivery (PC-01)

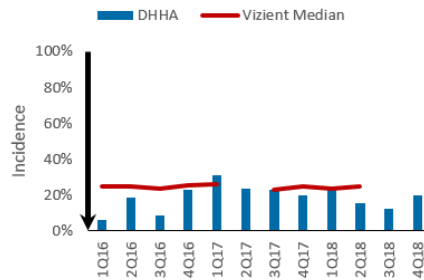**Figure 1.6-3: Cesarean Section (PC-02)**

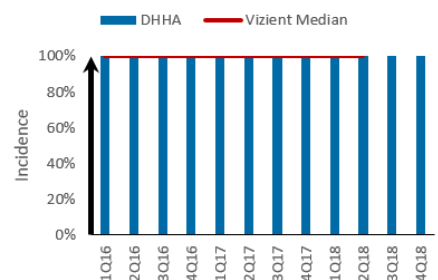**Figure 1.6-4: Antenatal Steroids (PC-03)**

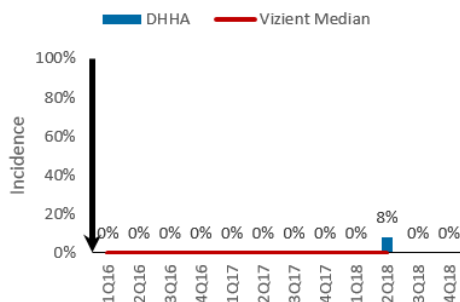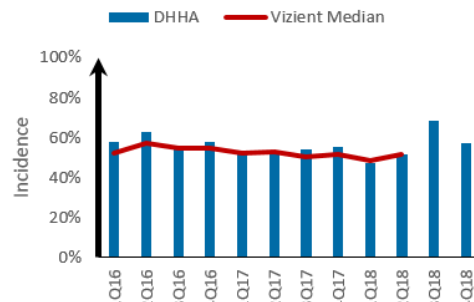**Figure 1.6-5: Healthcare Associated Blood Stream Infections in Newborns (PC-04)**

Figure 1.6-6: Exclusive Breast Milk Feeding Overall (PC-05)

- ■ **PI Activity**
  - ◇ Exclusive breast milk feeding results are provided to the Breast Feeding Council bimonthly.
  - ◇ DPSQ Staff review failed PC-02 cases to identify possible causes for worsening performance.
  - ◇ OB/GYN Department reviews cesarean section rates and indications for the procedure monthly to monitor appropriate usage. Provider-level reports are distributed annually.

- ■ **Future Impact**
  - ◇ CY 2019: TJC added a new perinatal care measure: Unexpected Complications in Term Newborns (PC-06).
  - ◇ 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 2020 payment determination (i.e. program year 2018), there were 22 measures (5 chart-abstracted, 8 web-based, 9 claims-based).

DHHA was not randomly selected by CMS for Outpatient Data Validation for the CY 2020 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.

Figure 1.6-7: CMS Hospital Outpatient Quality Reporting Program: Claims-Based Measures

ID	Measure	DHHA	National	Encounters
OP-8	MRI Lumbar Spine for Low Back Pain	45.8%	38.7%	7/1/17-6/30/18
OP-9	Mammography Follow-up Rates	13.2%	8.9%	7/1/17-6/30/18
OP-10	Abdomen Computed Tomography — Use of Contrast Material	2.0%	6.9%	7/1/17-6/30/18
OP-11	Thorax Computed Tomography — Use of Contrast Material	3.4%	1.4%	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-14	Simultaneous Use of Brain Computed Tomography (CT) and Sinus CT	0.8%	1.2%	7/1/17-6/30/18
OP-32	Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy per 1,000 colonoscopies	14.7	14.8	CY 2018
OP-35	Admissions and ED Visits for Patients Receiving Outpatient Chemotherapy	18.9%*	n/a	1/1/18-11/30/18
OP-36	Hospital Visits After Hospital Outpatient Surgery	7.1%*	n/a	1/1/18-11/30/18

* Preliminary results

Web-Based Measures

These measures are submitted annually. DH had zero cases for Colonoscopy Interval for Patients with History of Adenomatous Polyps (OP-30) and 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.

Figure 1.6-8: CMS Hospital Outpatient Quality Reporting Program: Web-Based Measures

ID	Measure	DHHA 2016	DHHA 2017	DHHA 2018
OP-12	Electronically Receive Laboratory Data Directly into EHR System as Discrete Searchable Data	Yes	Yes	Yes
OP-17	Ability to Track Clinical Results Between Visits	Yes	Yes	Yes
OP-29	Appropriate Follow-up Interval for Normal Colonoscopy in Average Risk Patients	97%	100%	98%

- ■ **Future Impact**
  - ◊ CY 2019:
    - CMS is retiring seven measures—Median Time to ECG (OP-5), Mammography Follow-up Rates (OP-9), Thorax CT with Contrast (OP-11), Electronically Receive Lab Data (OP-12), Simultaneous Use of Brain CT and Sinus CT (OP-14), Ability to Track Clinical Results Between Visits (OP-17), and Colonoscopy Interval with History of Adenomatous Polyps (OP-30).
    - CMS is adding a new stroke measure: Door to Transfer to Another Hospital (STK-1)

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 (OQR) 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 IQR and TJC ORYX programs required two chart-abstracted ED measures in 2018: ED length of stay for admitted patients (ED-1) and time from admit decision to ED departure (ED-2). DHHA selected eED-1 as an eCQM for the TJC ORYX program and eED-2 as an eCQM for CMS IQR and TJC ORYX programs. CMS OQR program required six measures related to the ED in 2018: fibrinolytic therapy within 30 minutes of ED arrival (OP-2), time to facility transfer for acute coronary intervention (OP-3), time to ECG (OP-5), ED length of stay for discharged patients (OP-18), left without being seen (OP-22), and interpretation of head CT or MRI scan within 45 minutes of arrival for stroke patients (OP-23). In 2018, DHHA had zero cases for the AMI and chest pain measures (OP-2, OP-3, OP-5).

- **2018 Results**
  ◊ 277 minutes was the median time from ED arrival to ED departure for patients admitted to the hospital (ED-1b)
  ◊ 133 minutes was the median time from admit decision to ED departure for patients admitted to the hospital (ED-2b)
  ◊ 260 minutes was the median time from ED arrival to ED departure for patients discharged from the ED (OP-18b)
  ◊ 4% of patients left the ED without been seen (OP-22)
  ◊ 50% of stroke patients had a head CT or MRI scan interpreted within 45 minutes of ED arrival (OP-23)
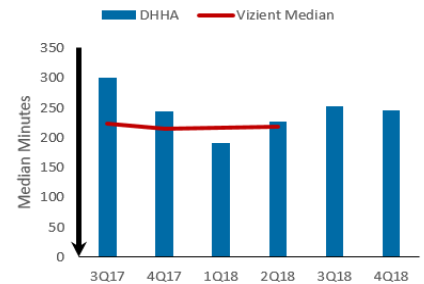
Figure 1.6-9: Time from ED arrival to departure for admitted patients (ED-1b)
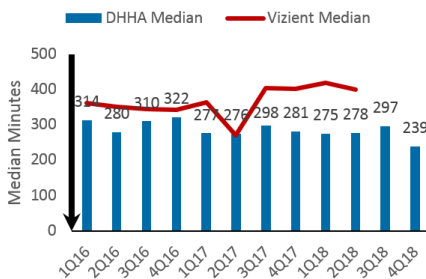
Figure 1.6-10: Time from admit decision to ED departure for admitted patients (ED-2b)
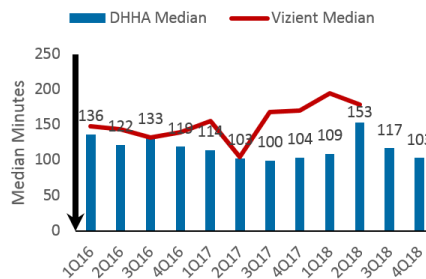
Figure 1.6-11: Time from ED arrival to departure for discharged patients (OP-18b)

- **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 patient's 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 within Epic to decrease staff time spent on chart abstractions.
  ◊ Worked with HIM department to ensure abstraction documentation components are included in the legal medical record.

- **Future Impact**
  ◊ CY 2019: CMS and TJC retired the chart-abstracted measure ED-1.
  ◊ CY 2020: CMS is retiring the chart-abstracted measures ED-2 and OP-21, as well as electronic measures eED-1 and eED-3.

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. 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 13 measures and 4 sub-measures for the FFY 2020 payment determination.

- ■ **Future Impact**
    - ◊ FY 2021: CMS has proposed a new measure—Medication Continuation Following Inpatient Psychiatric Discharge
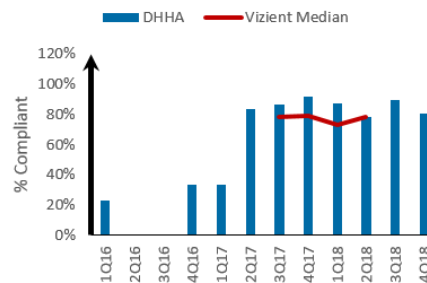
Alcohol Use (IPF-SUB)
- ■ **2018 Results**
    - ◊ 88% of psychiatric inpatients who screened positive for unhealthy alcohol use, alcohol abuse, or alcohol dependence were offered a brief intervention during the hospital stay (IPF-SUB-2).
    - ◊ 84% of psychiatric inpatients who screened positive for unhealthy alcohol use, alcohol abuse, or alcohol dependence received a brief intervention during the hospital stay (IPF-SUB-2a).
    - ◊ 39% of psychiatric inpatients who screened positive for unhealthy alcohol use or other drug use disorder were offered treatment at discharge (IPF-SUB-3).
    - ◊ 30% of psychiatric inpatients who screened positive for unhealthy alcohol use or other drug use disorder received treatment at discharge (IPF-SUB-3a).

Figure 1.6-12: Brief Intervention Offered in Hospital Stay (IPF-SUB-2)
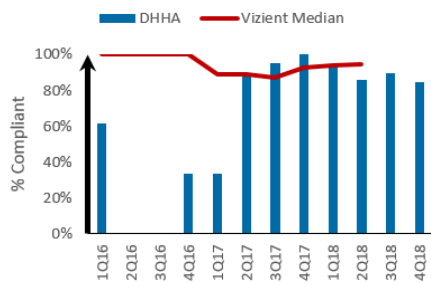
Figure 1.6-13: Brief Intervention Received in Hospital Stay (IPF-SUB-2a)

Figure 1.6-14: Alcohol and other Drug Use Disorder Treatment Provided/ Offered at Discharge (IPF-SUB-3)
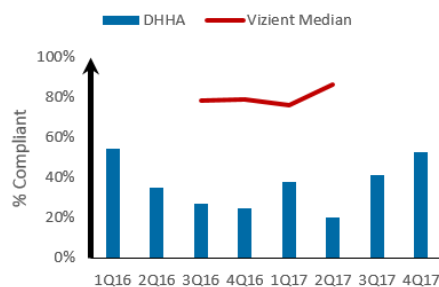
Figure 1.6-15: Alcohol and Other Drug Use Disorder Treatment Provided at Discharge (IPF-SUB-3a)
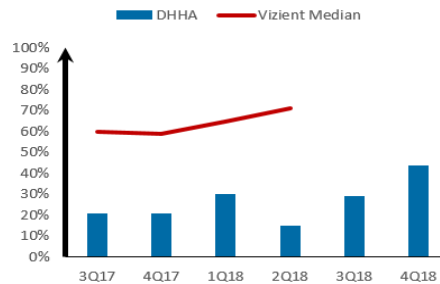
- ■ **PI Activity**
    - ◊ DPSQ met with the Behavioral Health division on a quarterly basis to share data and identify areas for improvement.
    - ◊ Epic is developing BPAs that will prompt clinician decision making for discharge medications and treatment plans.
    - ◊ Epic is updating the admission order set to prompt completion of specific lab values during admission.

1.6. CMS/The Joint Commission Clinical Quality Measures

CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

Tobacco Use (IPF-TOB)

- **2018 Results**
    - ◊ 92% 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).
    - ◊ 26% 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).
    - ◊ 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).
    - ◊ 8% 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 1.6-16: Tobacco Use Treatment Offered in Hospital Stay (IPF-TOB-2)

Figure 1.6-17: Tobacco Use Treatment Received in Hospital Stay (IPF-TOB-2a)

Figure 1.6-18: Tobacco Use Treatment Offered at Discharge (IPF-TOB-3)
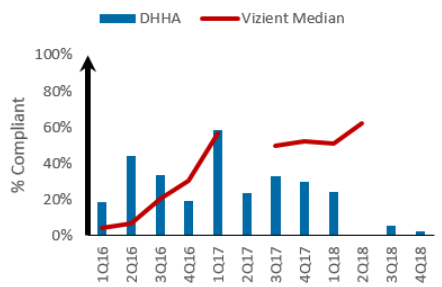
Figure 1.6-19: Tobacco Use Treatment Provided at Discharge (IPF-TOB-3a)
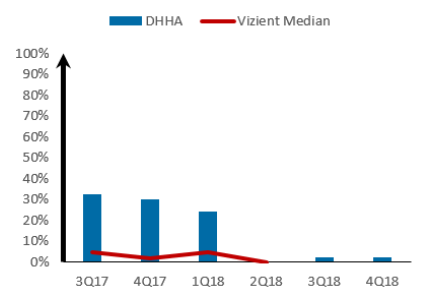
- **PI Activity**
    - ◊ DPSQ met with the Behavioral Health division on a quarterly basis to share data and identify areas for improvement.
    - ◊ Epic is developing BPAs that will prompt clinician decision making for discharge medications and treatment plans.
    - ◊ Epic is updating the admission order set to prompt completion of specific lab values during admission.

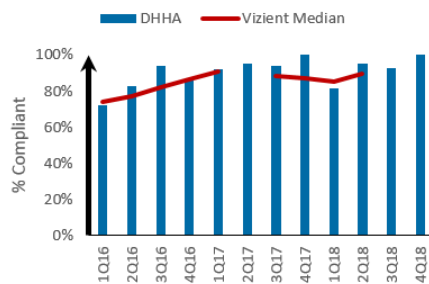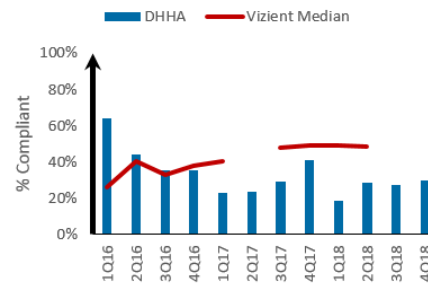## 1.6. CMS/The Joint Commission Clinical Quality Measures

CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

Hospital-Based Inpatient Psychiatric Services (HBIPS)
- **2018 Results**
  - ◊ 0.72 hours of physical restraint usage per 1,000 patient hours (HBIPS-2).
  - ◊ 0.48 hours of seclusion used per 1,000 patient hours (HBIPS-3).
  - ◊ 67% of patients discharged on multiple antipsychotic medications had appropriate justification (HBIPS-5).

Figure 1.6-20: Physical restraint rate (HBIPS-2)
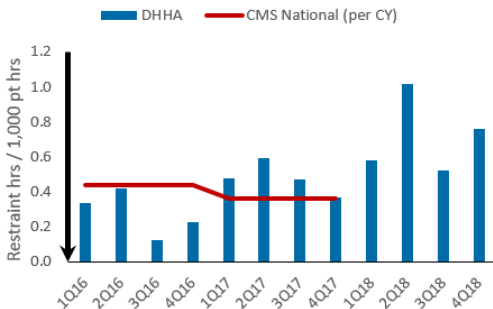
Figure 1.6-21: Seclusion rate (HBIPS-3)
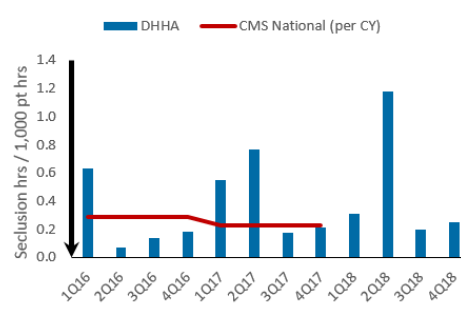
Figure 1.6-22: Multiple discharge antipsychotic medications justified (HBIPS-5)
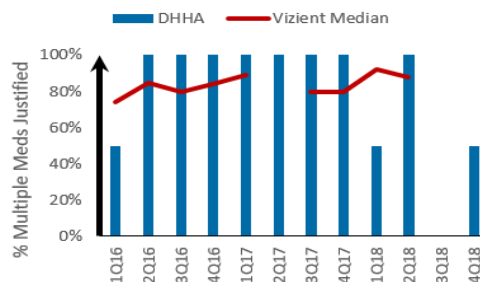
- **PI Activity**
  - ◊ DPSQ and Epic Inpatient Clinical Documentation teams collaborated to create a drop-down list with allowable justifications for multiple antipsychotic medications in the provider discharge summary.

Influenza Immunization (IPF-IMM-2)

- **2018 Results**
  - ◊ During the 2017-2018 flu season, 99.7% of psychiatric inpatients received their influenza immunization.
  - ◊ During the first half of the 2018-2019 flu season, 100% of patients received their influenza immunization.

- **PI Activity**
  - ◊ See activities under Hospital Inpatient Influenza Immunization (IMM) Clinical Quality Measure.

Figure 1.6-23: Influenza Immunization (IPF-IMM-2)
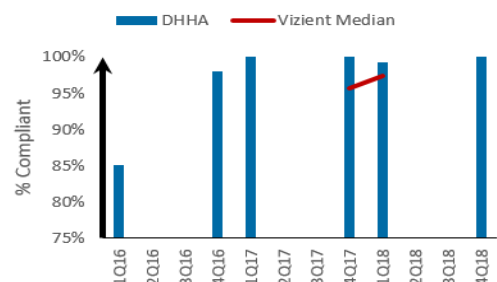
1.6. CMS/The Joint Commission Clinical Quality Measures

CMS Inpatient Psychiatric Quality Reporting (IPFQR) Program

Transitions of Care and Screening for Metabolic Disorders
- **2018 Results**
  - ◊ 89% of psychiatric inpatients received a transition record with 11 mandatory elements (IPF-TTR-1).
  - ◊ 88% of psychiatric inpatients received their transition record within 24 hours of discharge (IPF-TTR-2).
  - ◊ 45% 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 1.6-24: Transition Record with Specified Elements Received by Discharged Patients (IPF-TTR-1)
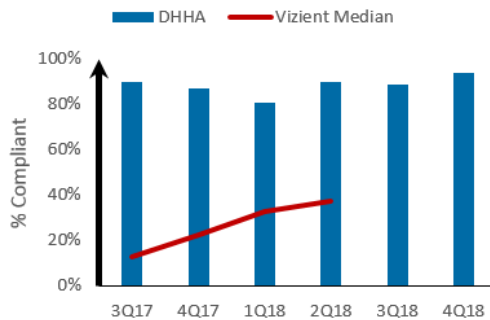
Figure 1.6-25: Timely Transmission of Transition Record (IPF-TTR-2)
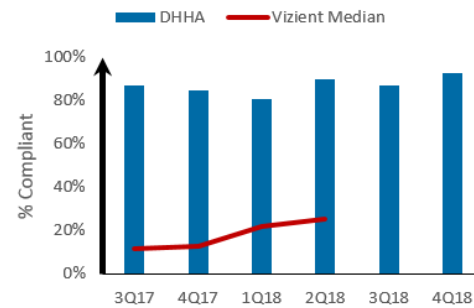
Figure 1.6-26: Screening for Metabolic Disorders (IPF-SMD-1)
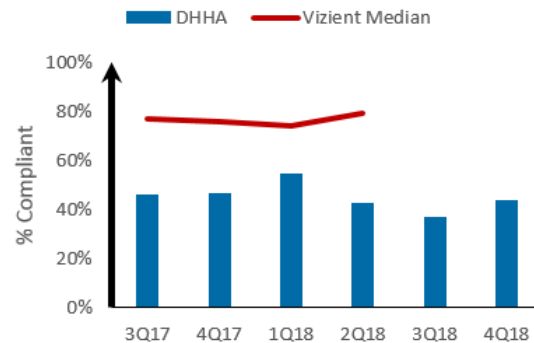
Claims-Based Measures

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, 2016 to June 30, 2017 while the readmission measure is based on July 1, 2015 to June 30, 2017.

Figure 1.6-27: CMS Inpatient Psychiatric Facility Quality Reporting Program: Claims-Based Measures

Measure ID	Measure	DHHA	National Median (Interquartile Range)
FUH-30	Follow-Up After Hospitalization for Mental Illness 30-Days	50.9%	52.5% (42.9% - 63.2%)
FUH-7	Follow-Up After Hospitalization for Mental Illness 7-Days	18.9%	28.0% (19.0% - 38.7%)
READM-30-IPF	30-Day All-Cause Unplanned Readmission Following Hospitalization in an Inpatient Psychiatric Facility	18.3%	20.1% (18.3% - 22.0%)

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 was unable to release new Star Ratings in 2018 due to methodology concerns. The rating below was released in February 2019.

DHHA increased from a 2-Star rating in December 2017 to a 3-Star rating in February 2019 (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—February 2019

Readmission*

Measure ID	Measure Description	DHHA Result	National Rate
READM-30-COPD	Chronic Obstructive Pulmonary Disease 30-Day Readmission Rate	19.3%	19.6%
READM-30-STK	Stroke 30-Day Readmission Rate	12.0%	11.9%
READM-30-HOSP-WIDE	Hospital-Wide All-Cause Unplanned Readmission	15.4%	15.3%
EDAC-30-AMI	Excess Days in Acute Care after Hospitalization for Acute Myocardial Infarction	5.4	7.1
EDAC-30-HF	Excess Days in Acute Care after Hospitalization for Heart Failure	10.7	4.5
EDAC-30-PN	Excess Days in Acute Care after Hospitalization for Pneumonia	40.2	4.7
OP-32	Facility 7-Day Risk-Standardized Hospital Visit Rate after Outpatient Colonoscopy	14.7%	14.8%

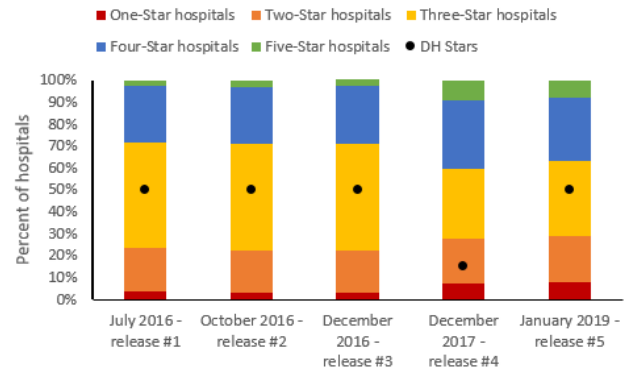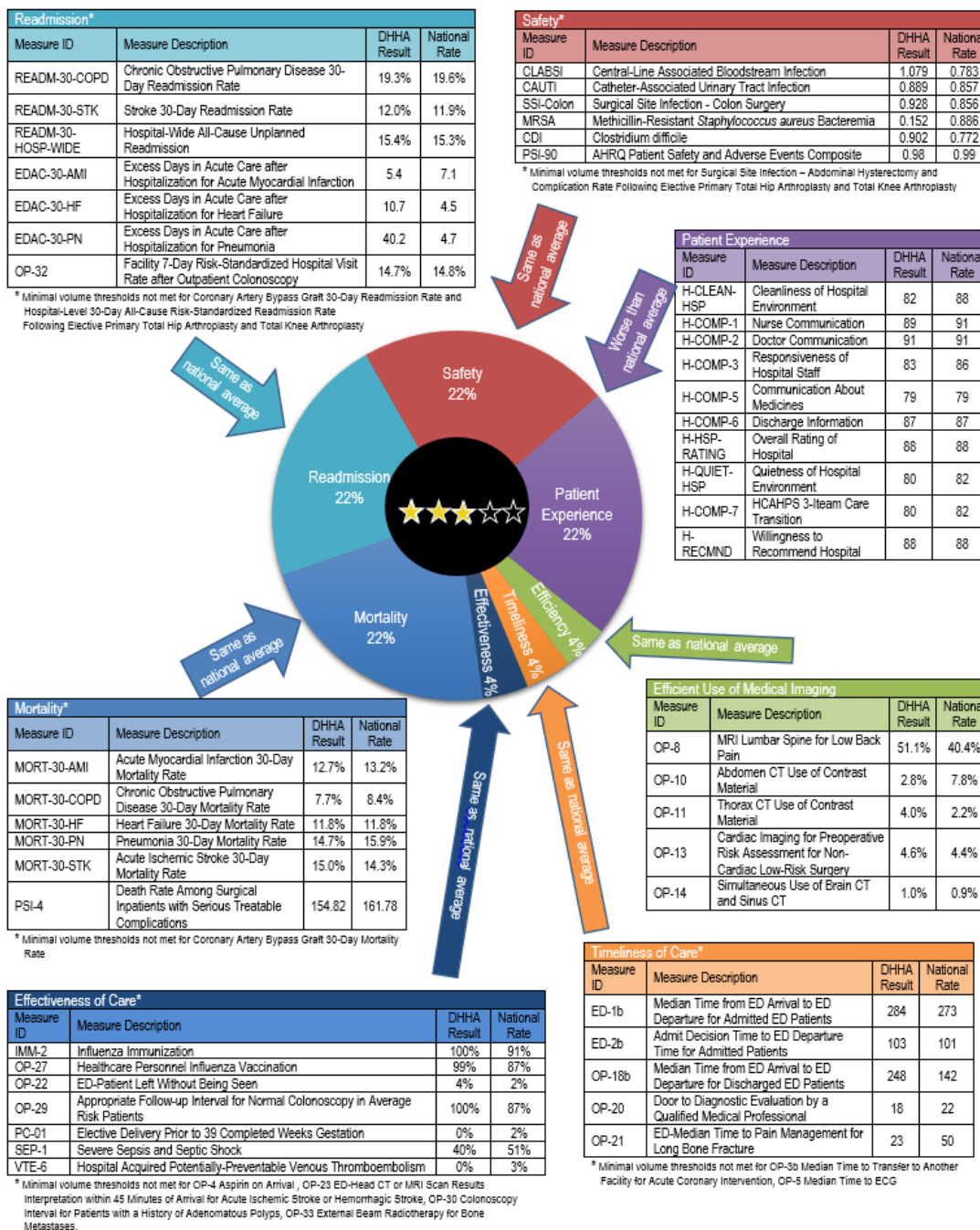* Minimal volume thresholds not met for Coronary Artery Bypass Graft 30-Day Readmission Rate and Hospital-Level 30-Day All-Cause Risk-Standardized Readmission Rate Following Elective Primary Total Hip Arthroplasty and Total Knee Arthroplasty

Safety*

Measure ID	Measure Description	DHHA Result	National Rate
CLABSI	Central-Line Associated Bloodstream Infection	1.079	0.783
CAUTI	Catheter-Associated Urinary Tract Infection	0.889	0.857
SSI-Colon	Surgical Site Infection - Colon Surgery	0.928	0.856
MRSA	Methicillin-Resistant *Staphylococcus aureus* Bacteremia	0.152	0.886
CDI	Clostridium difficile	0.902	0.772
PSI-90	AHRQ Patient Safety and Adverse Events Composite	0.98	0.99

* Minimal volume thresholds not met for Surgical Site Infection – Abdominal Hysterectomy and Complication Rate Following Elective Primary Total Hip Arthroplasty and Total Knee Arthroplasty

Patient Experience

Measure ID	Measure Description	DHHA Result	National Rate
H-CLEAN-HSP	Cleanliness of Hospital Environment	82	88
H-COMP-1	Nurse Communication	89	91
H-COMP-2	Doctor Communication	91	91
H-COMP-3	Responsiveness of Hospital Staff	83	86
H-COMP-5	Communication About Medicines	79	79
H-COMP-6	Discharge Information	87	87
H-HSP-RATING	Overall Rating of Hospital	88	88
H-QUIET-HSP	Quietness of Hospital Environment	80	82
H-COMP-7	HCAHPS 3-Iteam Care Transition	80	82
H-RECMND	Willingness to Recommend Hospital	88	88

Mortality*

Measure ID	Measure Description	DHHA Result	National Rate
MORT-30-AMI	Acute Myocardial Infarction 30-Day Mortality Rate	12.7%	13.2%
MORT-30-COPD	Chronic Obstructive Pulmonary Disease 30-Day Mortality Rate	7.7%	8.4%
MORT-30-HF	Heart Failure 30-Day Mortality Rate	11.8%	11.8%
MORT-30-PN	Pneumonia 30-Day Mortality Rate	14.7%	15.9%
MORT-30-STK	Acute Ischemic Stroke 30-Day Mortality Rate	15.0%	14.3%
PSI-4	Death Rate Among Surgical Inpatients with Serious Treatable Complications	154.82	161.78

* Minimal volume thresholds not met for Coronary Artery Bypass Graft 30-Day Mortality Rate

Efficient Use of Medical Imaging

Measure ID	Measure Description	DHHA Result	National Rate
OP-8	MRI Lumbar Spine for Low Back Pain	51.1%	40.4%
OP-10	Abdomen CT Use of Contrast Material	2.8%	7.8%
OP-11	Thorax CT Use of Contrast Material	4.0%	2.2%
OP-13	Cardiac Imaging for Preoperative Risk Assessment for Non-Cardiac Low-Risk Surgery	4.6%	4.4%
OP-14	Simultaneous Use of Brain CT and Sinus CT	1.0%	0.9%

Effectiveness of Care*

Measure ID	Measure Description	DHHA Result	National Rate
IMM-2	Influenza Immunization	100%	91%
OP-27	Healthcare Personnel Influenza Vaccination	99%	87%
OP-22	ED-Patient Left Without Being Seen	4%	2%
OP-29	Appropriate Follow-up Interval for Normal Colonoscopy in Average Risk Patients	100%	87%
PC-01	Elective Delivery Prior to 39 Completed Weeks Gestation	0%	2%
SEP-1	Severe Sepsis and Septic Shock	40%	51%
VTE-6	Hospital Acquired Potentially-Preventable Venous Thromboembolism	0%	3%

* Minimal volume thresholds not met for OP-4 Aspirin on Arrival , OP-23 ED-Head CT or MRI Scan Results Interpretation within 45 Minutes of Arrival for Acute Ischemic Stroke or Hemorrhagic Stroke, OP-30 Colonoscopy Interval for Patients with a History of Adenomatous Polyps, OP-33 External Beam Radiotherapy for Bone Metastases.

Timeliness of Care*

Measure ID	Measure Description	DHHA Result	National Rate
ED-1b	Median Time from ED Arrival to ED Departure for Admitted ED Patients	284	273
ED-2b	Admit Decision Time to ED Departure Time for Admitted Patients	103	101
OP-18b	Median Time from ED Arrival to ED Departure for Discharged ED Patients	248	142
OP-20	Door to Diagnostic Evaluation by a Qualified Medical Professional	18	22
OP-21	ED-Median Time to Pain Management for Long Bone Fracture	23	50

* Minimal volume thresholds not met for OP-3b Median Time to Transfer to Another Facility for Acute Coronary Intervention, OP-5 Median Time to ECG

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 2018, HCPF added measures on Behavioral Health Organization engagement, hospital acquired *Clostridium difficile* infection, falls with injury, discharge planning, and breastfeeding practices.

DHHA received full points on the Regional Care Collaborative / Behavioral Health Organization (RCCO/BHO) and Discharge Planning domains. Our *Clostridium difficile* infection rate was same as the national rate. DHHA's cesarean section rate went from the best quartile last year to the worst quartile this year. DHHA received a final score of 64 of 80 points which translated into an estimated payment of $7,551,062 (Figure 1.8-1). Over the prior five years, DHHA received over $29 million in incentive payments from this program (Figure 1.8-2).

- ■ **Next Steps:**
  - ◊ Educate the Obstetrics Department on the importance of documenting medical reasons for cesarean sections.
  - ◊ Continue work to improve the rapid availability of comprehensive outpatient services designed for patients who might otherwise be admitted.

- ■ **Future Impact of 2019 Program**
  - ◊ Eleven new measures added: Perinatal Depression and Anxiety, Maternal Emergencies, Reproductive Life/Family Planning, HCAHPS, Follow-up after Hospitalization for Mental Illness 7 Days, Follow-up after Hospitalization for Mental Illness 30 Days, Emergency Department Utilization for Mental Health, Emergency Department Utilization for Substance Use Disorder, Substance Use Disorder Composite, Alternatives to Opioids (ALTO), and Prometheus Hospital Index.
  - ◊ Three measures retired: RCCO/BHO Engagement, Culture of Safety, and Care Transitions

Figure 1.8-1: HQIP Program Year 2018

Measure Name	Rate/Result	Time	Points
Regional Care Collaborative Organization and Behavioral Health Organization Engagement 1. Notify RCCO within 24 hours of ED visits 2. Notify RCCO of inpatient hospitalizations 3. Collaborate with RCCO/BHO on substance use 4. RCCO Engagement: a) Population health, b) Care coordination, c) Case management, d) High utilizers, e) RCCO Advisory committees 5. BHO Engagement: a) High utilizers, b) Case management, c) Staff training, d) Notify BHO of ED patient suicide attempt/ideation, e) Follow-up with BHO/patient within 24 hours of suicide attempt, f) BHO Advisory committees	#1: Yes #2: Yes #3: Yes #4: Yes (a-e) #5: Yes (a,b,c,e)	CY 2018	20 of 20
Culture of Safety/Patient Safety 1. Patient and Family Advisory Council 2. Hospital Safety Leadership 3. Patient Safety Survey 4. Daily Unit Safety Briefings/Huddles 5. Hospital Acquired *C. Difficile* Infections 6. Adverse Events Reporting 7. Falls with Injury	#1: Yes #2: Yes #3: Yes #4: No #5: Same as national rate #6: Yes #7: 0.05	CY 2018 (CY 2017 for C. Diff and falls)	18 of 20
Discharge Planning 1. Advanced Care Planning 2. Care Transition Activities	#1: 99.9% #2: Yes	ACP: CY 2017 CTA: CY 2018	20 of 20
Cesarean Section Rate (PC-02)	24.0%	CY 2017	0 of 10
Breastfeeding Practices 1. Exclusive Breast Milk Feeding (PC-05) 2. Breastfeeding policy 3. 4-D Pathway to Baby-Friendly Designation / Baby-Friendly Designation	#1: 53.7% #2: Yes #3: No	CY 2017	6 of 10
INCENTIVE PAYMENT	$7,551,062		**64 of 80**

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

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

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's rise to a letter grade of A reflects enterprise-wide efforts to prevent hospital acquired infections, improve the patient experience, provider education on appropriate documentation, and a culture of safety (Figure 1.9).

Figure 1.9: 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
B	B	B	C	C	C	C	C	C	A

Outcome Measures	DHHA Score	Average Performing Hospital	Time Period
Dangerous object left in patient's body	0	0.02	10/1/15—6/30/17
Air or gas bubble in blood	0	0.00	10/1/15—6/30/17
Patient falls	0.405	0.43	10/1/15—6/30/17
Infection in the blood	0.888	0.79	1/1/17—12/31/17
Infection in the urinary tract	0.948	0.87	1/1/17—12/31/17
Surgical site infection after colon surgery	1.261	0.86	1/1/17—12/31/17
MRSA infection	0.152	0.88	1/1/17—12/31/17
C. difficile infection	0.81	0.79	1/1/17—12/31/17
Dangerous bed sores	0.13	0.38	10/1/15—6/30/17
Death from treatable serious complications	154.82	161.65	10/1/15—6/30/17
Collapsed lung	0.35	0.29	10/1/15—6/30/17
Serious breathing problems	7.56	8.23	10/1/15—6/30/17
Dangerous blood clot	5.45	3.84	10/1/15—6/30/17
Surgical wound splits open	0.78	0.85	10/1/15—6/30/17
Accidental cuts and tears	1.18	1.29	10/1/15—6/30/17

Process Measures	DHHA Score	Average Performing Hospital	Time Period
Doctors order medications through a computer	100	69.80	2018
Safe medication administration	100	68.26	2018
Specially trained doctors care for ICU patients	100	49.17	2018
Effective leadership to prevent errors	120	117.14	2018
Staff work together to prevent errors	110.77	114.54	2018
Track and reduce risks to patients	100	96.93	2018
Enough qualified nurses	100	97.68	2018
Handwashing	60	57.63	2018
Communication with nurses	89	90.95	10/1/16—9/30/17
Communication with doctors	91	91.16	10/1/16—9/30/17
Responsiveness of hospital staff	82	84.20	10/1/16—9/30/17
Communication about medicines	79	77.96	10/1/16—9/30/17
Communication about discharge	88	86.88	10/1/16—9/30/17

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 *Clostridium 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 1.11). Improvement efforts are described in the Infection Control section.

Figure 1.11: Denver Health Healthcare-Associated Infections

		2015				2016				2017			
		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		9	***	***	***	52	3	2.0	Same	42	2	1.8	Same
Colon Surgery		124	15	2.1	Worse	129	13	1.5	Same	137	8	0.9	Same
Hip Replacement		151	8	3.8	Worse	109	2	1.2	Same	92	3	2.6	Same
Knee Replacement		153	0	0	Same	160	1	1.0	Same	103	1	***	***
Abdominal Hysterectomy		74	3	1.4	Same	74	1	0.5	Same	76	4	1.9	Same
	Unit Type	# Central Line Days	# Infections	SIR	National Comparison	# Central Line Days	# Infections	SIR	National Comparison	# Central Line Days	# Infections	SIR	National Comparison
Central Line -Associated Bloodstream Infections	MICU	2,772	4	1.3	Same	2,867	4	1.2	Same	1,870	2	0.9	Same
	PICU	103	0	***	***	121	0	***	***	138	0	***	***
	Trauma ICU	2,015	9	2.9	Worse	1,606	5	2.0	Same	1,465	4	1.8	Same
	NICU	1,385	7	5.1	Worse	1,043	3	***	***	714	0	***	***
	Inpt Rehab	158	9	***	***	110	0	***	***	217	0	***	***
		# Patient Days	# Infections	SIR	National Comparison	# Patient Days	# Infections	SIR	National Comparison	# Patient Days	# Infections	SIR	National Comparison
C. difficile Infections		100,757	91	1.2	Same	95,481	90	1.2	Same	98,519	64	0.8	Same

*** 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 2018, 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. The equity domain reflects that female patients and those with commercial insurance spend a longer time in the ED before admission compared to male patients and those without commercial insurance, respectively. There was also a longer time between admission order and ED departure for commercially insured patients compared to those without commercial insurance.

Figure 2.1-1: Vizient Q&A Scorecard Star Ratings for Denver Health
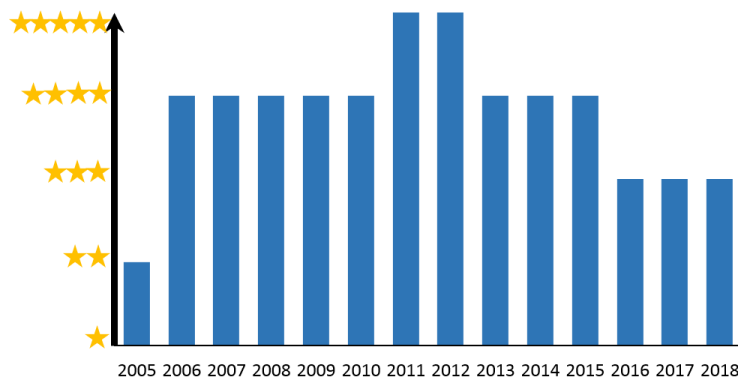
Figure 2.1-2: Vizient 2018 Q&A Scorecard Summary for Denver Health
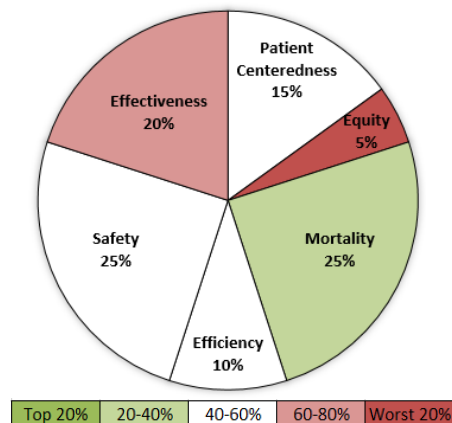
- ■ **Future Impact of 2019 Q&A**
    - ◊ Comparison groups: Vizient is expanding to four cohorts with the addition of the "Large, Specialized Complex Care Medical Center" and DHHA will be in this new cohort.
    - ◊ Domain Weights: The Equity domain will be informational only because CMS retired many of the metrics and new measures will be tested. Its weight will shift to the other domains. The laboratory measures will be scored.
    - ◊ A new strategic imperative of DPSQ will focus on disparities including the metrics in the Equity domain.
    - ◊ The Patient Flow Committee will continue its work to decrease length of stay in the Emergency Department.

Figure 2.1-3: Vizient 2018 Quality and Accountability Scorecard for Denver Health

Efficiency* (10%)

LENGTH OF STAY

Vizient Service Line	O/E	Percentile Rank	Compared to Q&A 2017
Cardiology	0.97	90th	▼
Cardiothoracic Surgery	1.11	90th	▲
Gastroenterology	0.89	50th	▼
Medicine General	0.80	20th	▲
Neurology	1.01	80th	▼
Neurosurgery	1.10	90th	▲
OB/GYN	1.03	70th	▼
Oncology	0.87	60th	▲
Ortho/Spine	0.89	70th	▲
Pulmonary/Critical Care	0.81	40th	▼
Surgery General	0.99	90th	▲
Trauma	1.04	90th	▼
Vascular Surgery	0.89	70th	▼
Urology	1.06	80th	▼

DIRECT COST

Vizient Service Line	O/E	Percentile Rank	Compared to Q&A 2017
Cardiology	0.73	30th	▲
Cardiothoracic Surgery	0.80	30th	▼
Gastroenterology	0.53	10th	▲
Medicine General	0.54	10th	▲
Neurology	0.57	10th	▲
Neurosurgery	0.66	20th	▲
OB/GYN	0.93	70th	--
Oncology	0.54	20th	▲
Ortho/Spine	0.81	50th	▲
Pulmonary/Critical Care	0.55	20th	▲
Surgery General	0.70	30th	▲
Trauma	0.89	70th	▲
Vascular Surgery	0.77	30th	▼
Urology	0.69	30th	▼

*Timeframe: July 2017 - June 2018

Effectiveness* (20%)

30-DAY ALL CAUSE UNPLANNED READMISSIONS

Vizient Service Line	Rate (%)	Percentile Rank	Compared to Q&A 2017
Cardiology	11.8	80th	▼
Cardiothoracic Surgery	15.8	90th	▼
Gastroenterology	13.2	60th	▲
Medicine General	19.8	100th	▼
Neurology	5.7	10th	▲
Neurosurgery	12.2	80th	▼
Oncology	15.7	30th	▲
Ortho/Spine	8.0	90th	▼
Pulmonary/Critical Care	8.2	10th	▲
Surgery General	12.8	100th	▲
Trauma	6.1	40th	▼
Vascular Surgery	17.7	90th	▲

EXCESS DAYS

Vizient Service Line	Days	Percentile Rank	Compared to Q&A 2017
Cardiology	4.0	70th	▲
Cardiothoracic Surgery	25.5	100th	▼
Gastroenterology	9.2	70th	▲
Medicine General	-2.2	10th	▲
Neurology	10.3	70th	▲
Neurosurgery	1.2	50th	▼
Oncology	-3.2	70th	▼
Ortho/Spine	1.8	70th	▲
Pulmonary/Critical Care	-18.1	40th	▲
Surgery General	9.7	80th	▲
Trauma	12.8	90th	▼
Vascular Surgery	-5.2	60th	▼

CMS CORE MEASURES

Metric ID	Description	Minutes	Percentile Rank	Compared to Q&A 2017
ED-1	Median time from ED arrival to departure for admitted patients	292	40th	▲
ED-2	Median time from admit decision to departure time for admitted patients	106	40th	▲
ED-OP-18	Median time from ED arrival to departure for discharged patients	277	100th	▼

*Timeframe: Readmissions/Excess Days July 2017 - May 2018, CMS Jan-Dec 2017

Safety* (25%)

AHRQ PATIENT SAFETY INDICATORS

Metric ID	Description	O/E	Percentile Rank	Compared to Q&A 2017
PSI-3	Pressure ulcer	0.40	30th	▲
PSI-6	Postoperative iatrigenic pneumothorax	0.29	40th	▲
PSI-9	Postoperative hemorrhage or hematoma	0.27	80th	▲
PSI-11	Postoperative respiratory failure	0.34	60th	▲
PSI-13	Postoperative sepsis	1.07	90th	▲

NHSN HEALTHCARE ASSOCIATED INFECTIONS

Metric ID	Description	Rate / SIR	Percentile Rank	Compared to Q&A 2017
THK	Total hip/total knee arthroplasty complication	1.59	50th	▼
CLABSI	Central line-associated blood stream infection	1.18	80th	▼
CAUTI	Catheter-associated urinary tract infection	0.80	50th	▲
C-Diff	Clostridium difficile infection	0.90	70th	▲
SSI	Surgical site infections: colon and abdominal hysterectomy	0.82	50th	▲

*Timeframe: AHRQ July 2017 - June 2018; NHSN April 2017 - March 2018

Lab* (0% - Informational Only)

Metric	Percent	Percentile Rank	Compared to Q&A 2017
Cases of severe sepsis/septic shock present at admission that do not have a lactate level within 12 hours of admit labs	1.10	10th	▼
Cases that received insulin and on the day of or day prior had a blood glucose level of ≤ 50 mg/dl	1.32	20th	▼
Cases that received warfarin and had an INR ≥ 5 afterward	2.34	50th	▲
Cases with all hemoglobins ≥ 9 on day of or day prior to first RBC transfusion	--	--	--

*Timeframe: July 2017 - June 2018

Patient Centeredness* (15%)

HCAHPS Survey Dimension	% Top Box	Percentile Rank	Compared to Q&A 2017
Nurse communication	77.79	80th	▲
Doctor communication	82.03	50th	▲
Pain management	70.99	40th	▲
Medication communication	70.35	10th	▲
Cleanliness and quietness	64.58	60th	▼
Responsiveness of staff	67.21	40th	▲
Discharge information	89.56	40th	▲
Overall rating of hospital	76.87	50th	▲
Transition of care composite	50.78	80th	▲

*Timeframe: July 2017 - March 2018

Mortality* (25%)

Vizient Service Line	O/E	Percentile Rank	Compared to Q&A 2017
Cardiology	1.29	100th	▼
Cardiothoracic Surgery	0.55	40th	▲
Gastroenterology	0.85	50th	▲
Medicine General	0.61	20th	▼
Neurology	0.75	40th	▼
Neurosurgery	0.78	60th	▲
Oncology	1.06	70th	▼
Ortho/Spine	0.24	20th	▲
Pulmonary/Critical Care	0.87	50th	▲
Surgery General	0.95	60th	▼
Trauma	0.83	50th	▼
Vascular Surgery	0.43	20th	▼

*Timeframe: July 2017 - June 2018

Equity* (5%)

Core Measure		p-value (≤ 0.01 significant difference)		
Metric		Gender	Race	Socio economic status
ED-1	Median time from ED arrival to departure for admitted patients	0.002	0.061	0.001
ED-2	Median time from admit decision to departure time for admitted patients	0.04	0.022	0.000
ED-OP-18	Median time from ED arrival to departure for discharged patients	0.213	0.406	0.738

*Timeframe: January 2017 - December 2017

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. Forty-eight academic medical centers and their affiliate physician organizations participated in 2018. 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 females had longer stays in the ED before admission, Medicaid patients had timelier new patient visits in Primary Care, and Commercial patients had timelier new patient visits at Dermatology, Infectious Disease, and Orthopedics clinics. In 2019, DHHA will focus on Equity and Continuum of Care, the domains with scores below the Vizient median.

Figure 2.2-1: Denver Health AQA Overall Rank

Figure 2.2-2: 2018 AQA Scorecard for Denver Health

| Top 20% | 20-40% | 40-60% | 60-80% | Worst 20% |
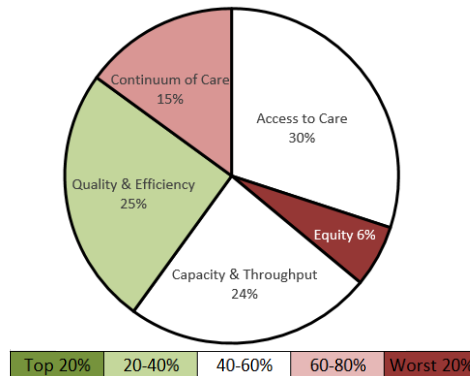
Figure 2.2-3: Vizient 2018 AQA Metrics for Denver Health

Domain	Metric	Cardiology	Dermatology	Endocrinology	ENT	GI & Hepatology	Hematology & Oncology	Infectious Disease	Nephrology	Neurology	OB/GYN	Opthalmology	Orthopedics	Primary Care	Pulmonology	Rheumatology	Surgery	Urology
Access to Care	% new patient visits over total visits	22.8	40.0	28.4	43.0	31.6	12.4	22.0	21.5	21.7	5.7	23.1	20.3	10.7	26.8	13.1	27.4	28.1
	% new patients seen within 10 days of scheduling an appointment	36.6	34.0	25.3	22.3	23.6	32.9	85.8	*	28.2	25.4	40.0	48.8	37.6	38.7	40.2	32.5	29.7
	Median days from scheduling appointment to visit for new patients visits	15.0	20.0	21.0	31.0	22.0	19.0	0.0	*	24.0	24.0	15.0	11.0	21.0	14.0	14.0	20.0	27.0
	% appointments cancelled by provider or clinic within 30 days of appointment date	3.4	7.1	4.1	5.4	3.9	5.8	3.3	*	2.9	1.5	3.8	4.5	3.0	1.9	1.6	2.2	0.3
Capacity & Throughput	Median encounters per provider per hour	1.0	2.3	1.3	2.3	1.3	1.6	1.3	1.5	1.3	1.6	2.0	1.7	1.9	1.3	1.3	1.2	1.4
	Consistency in encounters per provider per hour	0.5	0.8	0.4	0.6	0.5	0.7	0.5	0.4	0.5	0.8	1.2	0.8	0.8	0.5	0.5	0.6	1.0
	ED median time for admitted patients (ED-1b)	292 minutes																
	ED median time for discharged patients (OP-18b)	277 minutes																
Equity	Disparity in new patients seen within 10 days of scheduling an appointment by commercial and Medicaid payer	-	D	-	-	-	-	D	-	-	-	-	D	D	-	-	-	-
	Disparity in ED median time for admitted patients by white and non-white race	-																
	Disparity in ED median time for admitted patients by female and male gender	D																

Domain	Metric	Performance
Continuum of Care	% of ED visits that are low acuity	56.2
	% of patients with 4 or more ED visits per year	5.5
	% of patients with return to ED within 7 days	8.7
Quality & Efficiency	Hospitalization rate for acute ambulatory care-sensitive condition: Bacterial pneumonia	0.0
	Hospitalization rate for acute ambulatory care-sensitive condition: Urinary tract infection	0.0
	Hospitalization rate for acute ambulatory care-sensitive condition: Dehydration	13.2
	Hospitalization rate for chronic ambulatory care-sensitive condition: Diabetes mellitus	*
	Hospitalization rate for chronic ambulatory care-sensitive condition: COPD or asthma	*
	Hospitalization rate for chronic ambulatory care-sensitive condition: Heart failure	*
	Total per-capita costs for all conditions ($)	10,004
	Total per-capita costs for specific chronic conditions ($)	*
	Medicare spending per beneficiary ($)	19,436

LEGEND	
Top 20%	Low data
20-40%	
40-60%	Significant Difference
60-80%	
Worst 20%	- is no difference

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 national-ly 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. The Baseline Period is January 2014—September 2016 with the exception of HAIs from January 2015—September 2016 and VTEs from October 2015—September 2016. The Performance Period is October 2016 to December 2018.

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.

DHHA's Target Zero aligns with many of the chosen initiatives in the HIIN Collaborative. Target Zero interventions are designed to improve performance on 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. In addition, based on data from the HIIN collabo-rative, DPSQ reports Narcan use to the Inpatient Pain and Opioid Stewardship Committee and is working closely with the diabe-tes educators to improve those measures. In 2019, DPSQ and critical care staff are collaborating on delirium prevention.

Figure 2.3: 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 (Periop)†	11.64		6.3			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 10,000 patient days. §Rate per 1000 patient days. ‖Rate per 1000 ventilator days.

2.4. Vizient Mortality Collaborative

Denver Health participated in Vizient's Mortality Review Process Collaborative in an effort to implement best practices for in-hospital death reviews.

Three best practices were identified, implemented, and maintained at DHHA during 2018:

■ Developed an electronic standardized tool for mortality review in SharePoint

■ Created a mechanism for additional review (if appropriate)

■ Identified categories (see figure 2.4-1) to determine opportunities for improvement

By utilizing best practices and reviewing every death, DHHA can identify areas of improvement in care. Referrals for secondary review are directed to the appropriate party to ensure a deeper, focused review. When opportunities of improvement or pre-vention are identified, education is provided to staff.

During 2018, DPSQ conducted mortality reviews on 100% of deaths (figure 2.4-1).

Figure 2.4-1: DHHA Mortality Review Findings
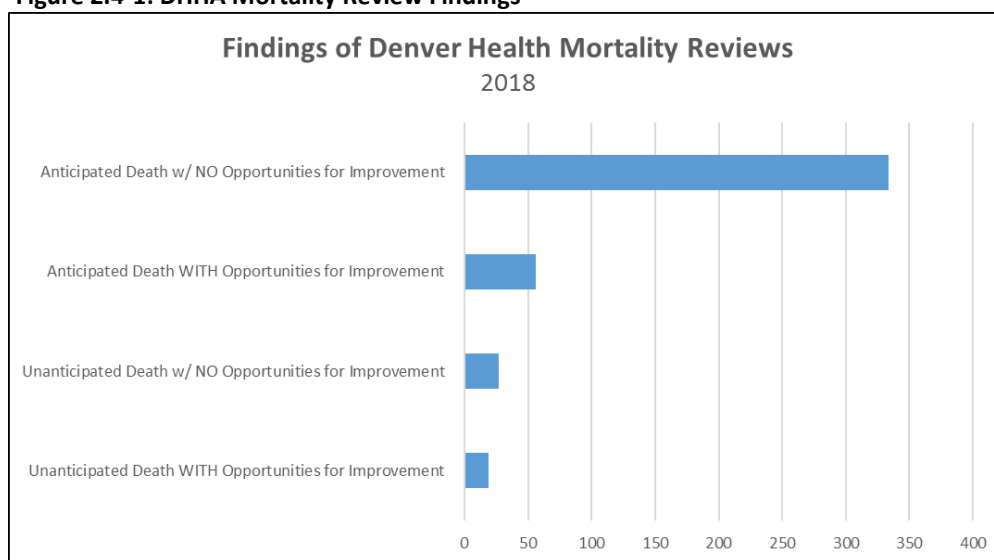
2019 Next Steps
■ Evaluate Datix Mortality Tool integration of mortality reviews by specialty and/or service lines.

2.5. Vizient Failure to Rescue Collaborative

Denver Health is participating in Vizient's Failure to Rescue Collaborative in an effort to implement an Early Warning System (EWS) as well as updating our current Rapid Response triggers and process. A robust EWS can identify patient deterioration markers sooner and potentially decrease patient events such as code blues, transfers to a higher level of care, and/or changes in vital signs that meet rapid response criteria. The collaborative is 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 2018 the following tasks were accomplished:

- Epic's Deterioration Index (DI) tool was chosen as DHHA's EWS
- A validation analysis was conducted to ensure proper functioning of the tool
- DI thresholds were established
  - Low risk: 0 to 30
  - Moderate risk: 30 to 60
  - High Risk: >60
- A pilot unit and timeframe were chosen
  - Acute care floor 9A
  - Target start date 2/1/19
- Baseline unit specific data was obtained and reviewed

During 2019, DPSQ will continue to participate in the Failure to Rescue Collaborative. The 9A pilot will be initiated to help further validate the functionality of the DI tool and to establish patient care guidelines related to DI risk levels. Following a successful pilot implementation of DI, the tool will be implemented throughout the organization's adult acute care units and ultimately used to redefine DHHA's Rapid Response process and guidelines.

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 offers two comparative databases and DHHA participates in both options. The very low birthweight (VLBW) database is for infants born between 501 and 1500 grams. The expanded database includes infants weighing over 500 grams at birth and who were admitted to a Neonatal Intensive Care Unit (NICU). VLBW neonates in this database at DHHA experienced higher mortality rates compared to the VON Network. 70% of the infants who died were less than 25 weeks gestation, reflecting a shift towards a much higher risk population of deliveries than in prior years. DHHA also had higher intraventricular hemorrhage rates, in part due to higher than typical volume of traumatic injuries. Reflecting a concerted effort at necrotizing enterocolitis (NEC) prevention, the NICU has experienced 0 cases of NEC for 2 consecutive years.

Figure 2.6-1: Vermont Oxford Network Key Performance Measures
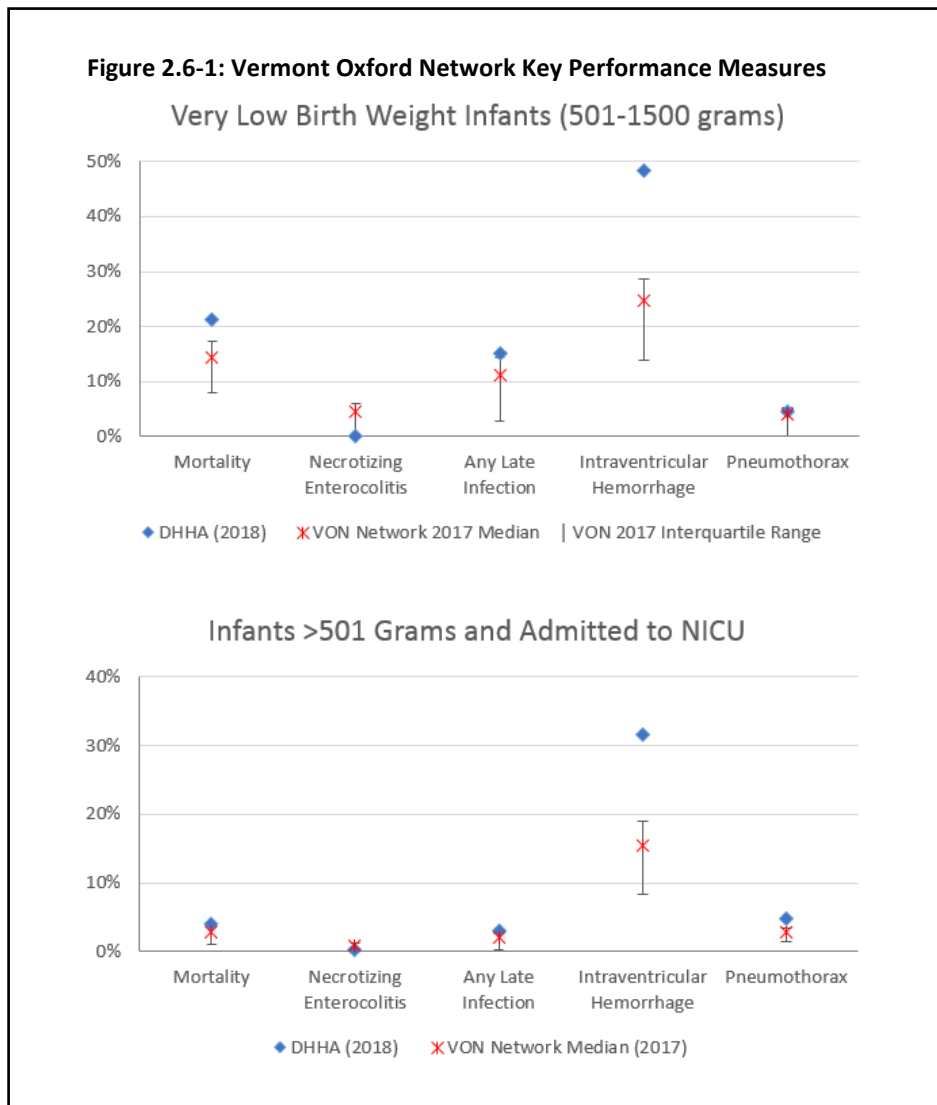
2.7. American College of Surgeons Trauma Quality Improvement Program (TQIP)

The American College of Surgeons Trauma Quality Improvement Program (TQIP) has more than 800 participating Trauma Centers throughout the United States. The program is designed to raise the bar for facilities providing trauma care. Its goal is 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 TQIP report includes the processes of care data which compares Denver Health with other trauma centers throughout the nation. It is a snap-shot comparison of different metrics that help provide guidance to the Trauma Quality and Safety Program.

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 96.3% compliant with this measure compared to a 89.6% national average. This can be related to availability of operating rooms and recognition of this cohort of patients that need direct attention.

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

Group	Isolated Hip Fracture N	Operative Fixation N	Operative Fixation %	Time to Operative Fixation (hours) Median (IQR)	Operative Fixation within 48 Hours of Admission N	Operative Fixation within 48 Hours of Admission %
All Hospitals	35,423	31,275	88.3	22.13 (16.02—31.57)	31,275	89.6%
DHHA	60	54	90.0	17.38 (11.95—25.53)	52	96.3%

Neurological Trauma Care

Per TQIP data, in trauma centers nationwide, cerebral monitoring was present in 22% of Traumatic Brain Injury (TBI) cases whereas DHHA placed cerebral monitoring devices in 31.6% 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 in house 24/7.

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

Group	Patients N	Cerebral Monitoring N	Cerebral Monitoring %	Time to Cerebral Monitoring (hours) Median (IQR)
All Hospitals	12,399	2,720	22.0	3.1 (1.9—7.0)
DHHA	38	12	31.6	2.1 (1.6—2.5)

Surgical Trauma

As shown in Figure 2.7-3, 72.2% of hemorrhagic shock patients at DHHA received the recommended Massive Transfusion Protocol, i.e. plasma to packed red blood cells (PRBCs) ratio between 1:1 and 1:2. This is due to aggressive TEG guided blood product resuscitation of RBCs and Fresh Frozen Plasma (FFP). This is better than the national average of 69.0%. DHHA continues to analyze these data with a more in depth review through the trauma PI process of analyzing every MTP.

Figure 2.7-3: Hemorrhagic Shock Management

Group	Patients[1] N	Plasma: PRBC Transfused Ratio between 1:1 and 1:2 N	Plasma: PRBC Transfused Ratio between 1:1 and 1:2 %[2]
All Hospitals	2,230	1,539	69.0
DHHA	18	13	72.2

[1] Patients receiving more than 6 units of PRBCs within 4 hours from ED/Hospital arrival

[2] Patients with no plasma or unknown volume of plasma are included in the denominator

Venous Thromboembolism (VTE) Prophylaxis

Several areas of opportunity have been identified in the administration of VTE prophylaxis (Figure 2.7-4). DHHA's administration of pharmacologic VTE prophylaxis was lower than the national average in penetrating trauma and isolated hip fractures but higher in TBI patients. DHHA has a higher injury severity in the penetrating trauma population. In regards to TBI patients, DHHA trauma care is on the cutting edge in administering VTE prophylaxis. In reviewing benchmarks for the isolated hip fractures population, DHHA was lower than the national average. Trauma services are taking a deeper dive into this measure as a PI project.

Figure 2.7-4: Pharmacologic VTE Prophylaxis by Cohort

Cohort	Group	Patients[1] N	VTE Prophylaxis N	%	Time to VTE Prophylaxis (days) Median (IQR)
All Patients	All Hospitals	277,455	182,291	65.7	2 (1-3)
	DHHA	1,041	708	68.0	1 (1-2)
Blunt Multisystem	All Hospitals	39,544	31,382	79.4	3 (2-4)
	DHHA	189	158	83.6	2 (1-4)
Penetrating	All Hospitals	13,206	10,449	79.1	2 (1-3)
	DHHA	70	54	77.1	1 (1-2)
Shock	All Hospitals	9,940	7,861	79.1	2 (1-4)
	DHHA	62	49	79.0	1 (1-3)
Severe TBI	All Hospitals	8,820	5,139	58.3	3 (2-5)
	DHHA	27	19	70.4	3 (3-5)
Elderly	All Hospitals	97,905	59,190	60.5	2 (1-3)
	DHHA	186	111	59.7	1 (1-3)
Elderly Blunt Multisystem	All Hospitals	9,388	6,931	73.8	2 (2-4)
	DHHA	26	19	73.1	2 (2-3)
Isolated Hip Fracture	All Hospitals	34,991	29,890	85.4	2 (1-2)
	DHHA	60	48	80.0	1 (1-1)

[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 six 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
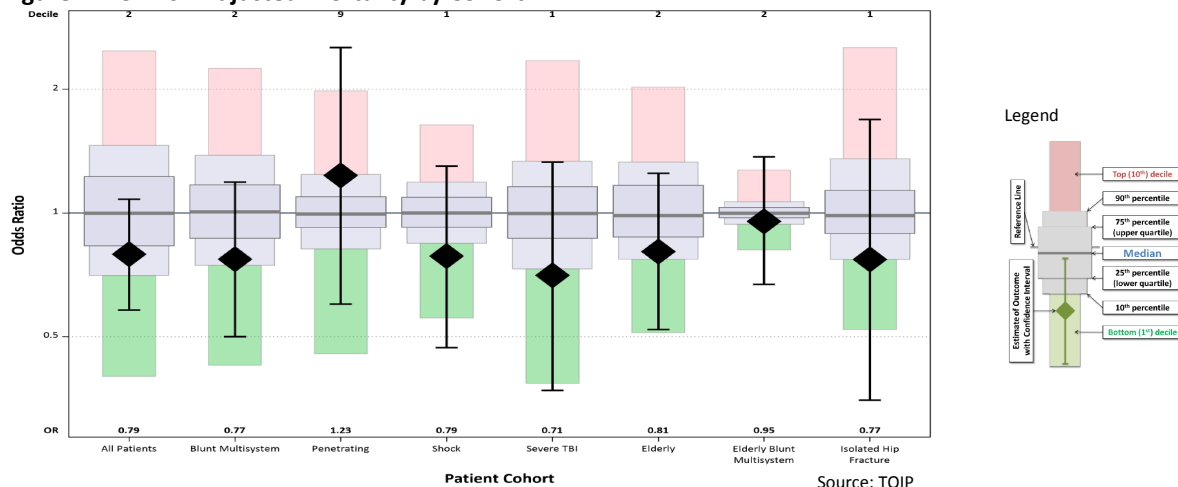
3. INPATIENT SAFETY & QUALITY INITIATIVES

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). For the third year in a row, DHHA achieved significant reductions in combined Target Zero events, most notably in the areas of surgical site infections and catheter associated urinary tract infections. 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. The Nursing Department reviews the fall events and determines whether they meet the National Database of Nursing Quality Indicators (NDNQI) criteria.

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 (IP) 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). Because it takes up to 90 days to identify an SSI, this metric is reported with a 3 month delay, e.g. SSI for procedures performed in January are reported in April.

***Clostridioides difficile* Infections (*C. difficile*)**
Hospital-acquired *C. difficile* infections are identified by IPs using the CDC's 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. Events are tied to the discharge date and discharge department.

Figure 3.1-1: Target Zero Events

Event Category	2015	2016	2017	2018	% Change Since 2017	% Change Since 2015
C. difficile	95	93	68	81	19%	-15%
CAUTI	40	33	21	11	-48%	-73%
CLABSI	32	20	10	11	10%	-66%
Falls with Injury	22	8	7	8	14%	-64%
Med Safety Events	7	17	8	7	-13%	0%
Venous Thromboembolism	43	46	30	28	-7%	-35%
Surgical Site Infections	24	25	27	12	-56%	-50%
Total	**263**	**242**	**171**	**158**	**-8%**	**-40%**

Lives impacted: 218 more patients would have suffered harm in 2016-18 had rates remained at 2015 levels.

Figure 3.1-2: Average Monthly Target Zero Events
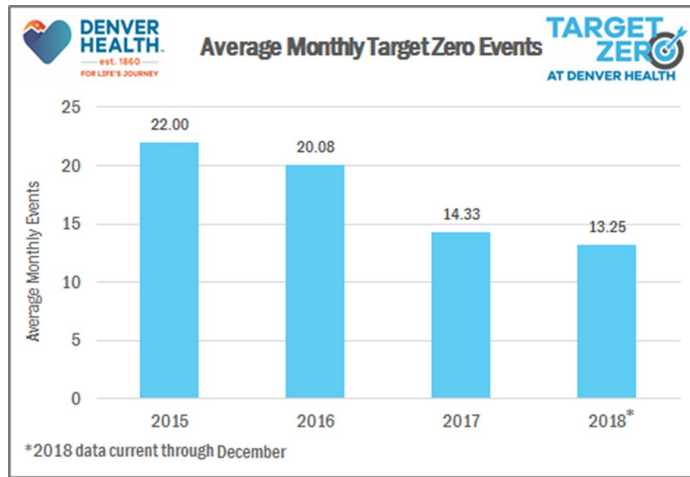
For the multifaceted Target Zero safety initiative, associated education campaign, and remarkable reductions in adverse events, DHHA was awarded the 2018 Gage Award Honorable Mention by America's Essential Hospitals. See subsequent sections for details of our efforts to reduce events in each category of outcome.

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. Inpatient Medication Reconciliation

Medication Reconciliation is a National Patient Safety Goal and improves continuity of care and safety for patients. Every hospitalized patient who is going home on medications is provided with a list of reconciled medications at discharge. The inpatient metric excludes patients who die, leave against medical advice, or are discharged from the neonatal intensive care unit or newborn nursery. DHHA exceeded our goal of 90% consistently throughout 2018 for both admission and discharge medication reconciliation.

Figure 3.2-1: Monthly Admission Medication Reconciliation 2017-2018
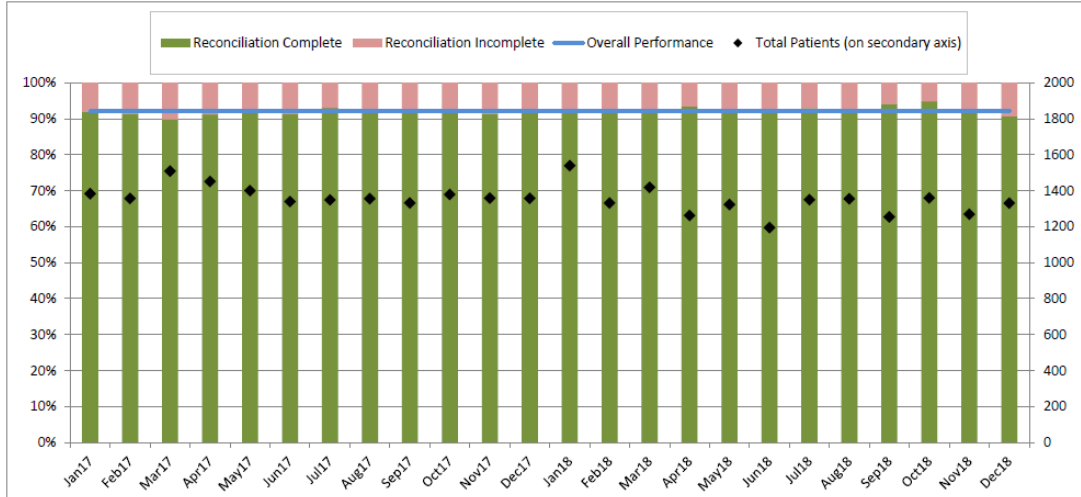
Current Methodology:

Admission medication reconciliation is expected within 24 hours of admission for all patients who occupy a hospital bed either in observation status or inpatient status. Collection is considered as complete if it was performed in SOARIAN LLC or Epic. Patients were included in the report if they were admitted during the reporting month. Patients were excluded if they were admitted to either the nursery or neonatal service.

Figure 3.2-2: Monthly Discharge Medication Reconciliation 2017-2018
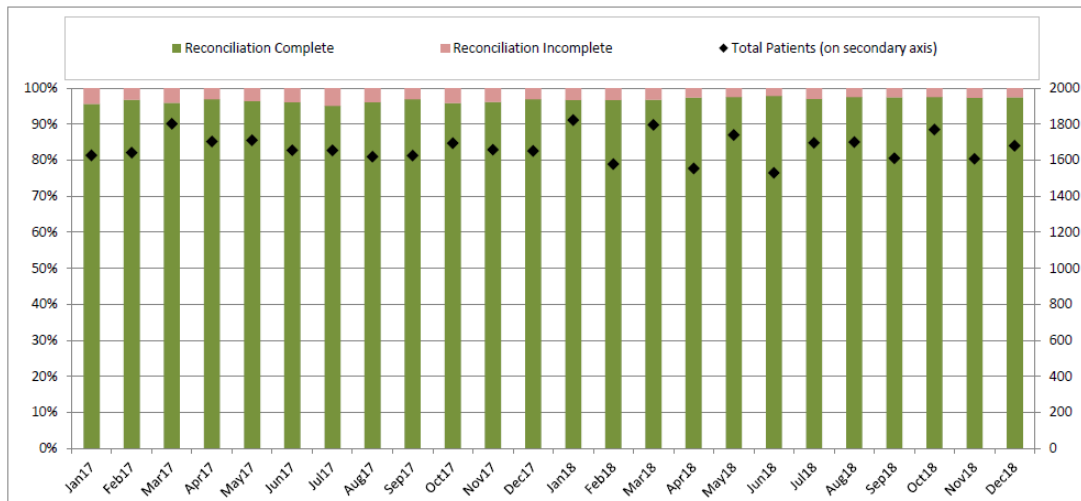
Current Methodology:

Discharge medication reconciliation is expected on all patients who occupy a hospital bed either in observation status or inpatient status except for patients discharged on no medications or who leave against medical advice. Medication Reconciliation is considered as complete if it was performed in SOARIAN LLC or Epic. Action must have taken place at some time during the patient's stay; before discharge took place. Patients were included in the report if they were discharged during the reporting month. Patients were excluded if they A) expired during their stay, B) were discharged AMA, or C) were discharged from either the nursery or neonatal service.

3.3. Pain and Opioid Stewardship

In 2017, the city of Denver experienced a record year for fatal overdoses with 201 deaths (Denverite, August 31, 2018). As a Safety Net Organization serving the Denver Metro area for over 150 years, we are acutely aware that we serve a vulnerable population and recognize we must take action to alleviate the opioid crisis in our city. Additionally, as part of a national effort to address the opioid crisis and increase the quality and safety of patient care, The Joint Commission (TJC) revised its pain assessment and management standards effective January 1, 2018. The new pain management standards required changes within multiple areas of Denver Health clinical practice and information technology.

The Joint Commission requirements effective January 1, 2018 are as follows:

- Identify pain assessment and pain management, including safe opioid prescribing, as an organizational priority (LD.04.03.13).
- Actively involve the organized medical staff in leadership roles in organization performance improvement activities to improve quality of care, treatment, and services and patient safety (MS.05.01.01).
- Assess and manage the patient's pain and minimize the risks associated with treatment (PC.01.02.07).
- Collect data to monitor its performance (PI.01.01.01).
- Compile and analyze data (PI.02.01.01).

Through a strategic planning process involving executive and clinical leadership, Denver Health created a multidisciplinary Inpatient Pain and Opioid Management Taskforce in late 2017. The outcome of this work is multifactorial, including improved pain management education for staff and patients/family, improved prescribing habits for providers, documentation enhancements, appropriate follow-up of adverse opioid events, enhanced management of patients who need medication assisted therapy, and comprehensive monitoring of metrics. Denver Health created nursing huddle and tip sheets, a pain management mini-tracer and rolled out hospital-wide nursing pain and opioid management education. Manager awareness of pain reassessments was facilitated by reports that show unit and individual data on performance.

In 2019, we will work to solidify staff and patient/family education, communicate expectations, and improve documentation and accountability. Additionally, we will monitor metrics, create a provider "app" for easy reference of pain and opioid management strategies on their mobile devices and adopt the Stop the Addiction Fatality Epidemic (SAFE) project as a way to visually engage our patients and staff in the efforts to address the opioid crisis.

In 2019, DHHA received controlled substance prescribing data from the Colorado Prescription Drug Monitoring Program (PDMP) showing temporal trends in prescribing practices for DHHA medical staff members compared to both Denver County prescribers and Colorado prescribers for years 2016-18. As shown in the table (figure 3.3-1), despite growth in the number of DHHA prescribers (likely from expansion of the medical staff), the number of opioid prescriptions written by those prescribers and the number of unique patients filling prescriptions written by DHHA providers have decreased significantly. More importantly, several of the key safety measures, including the percent of patients who are on high dose opioids (defined both as >90 and >120 Morphine Milligram Equivalent (MME)) and percent of patients receiving both benzodiazepine and opioid prescriptions are lower than both Denver County and Colorado for all three years and declining over time (figures 3.3-2—3.3-5). We believe this is the result of both local and state-wide efforts to drive better opioid stewardship and guideline adherence.

Figure 3.3-1: Colorado Prescription Drug Monitoring Program (PDMP) 2016-2018

Colorado Prescription Drug Monitoring Program 2016-2018				
	2016	2017	2018	% Change 2016-18
Total PDMP prescriptions	8,740,098	8,115,433	7,520,388	-14.0%
Total PDMP patients	1,582,542	1,616,638	1,507,184	-4.8%
Total PDMP prescribers	62,556	63,085	60,722	-2.9%
DH PDMP prescriptions	183,398	178,155	166,640	-9.1%
DH PDMP patients	48,358	46,914	43,268	-10.5%
DH PDMP prescribers	889	898	941	5.8%

Figure 3.3-2: Opioid Prescribing Improvement Efforts
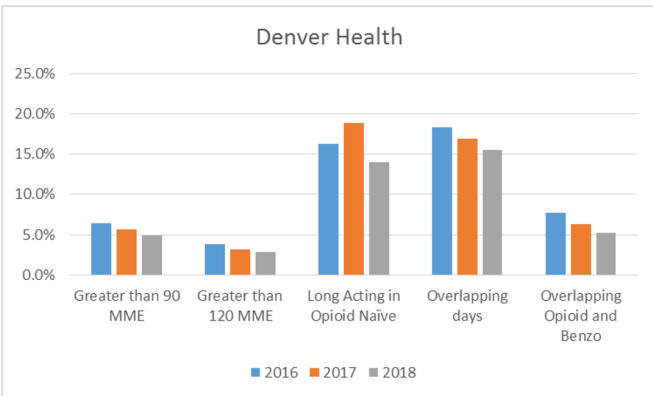
Figure 3.3-3: Opioid Prescribing Improvement Efforts
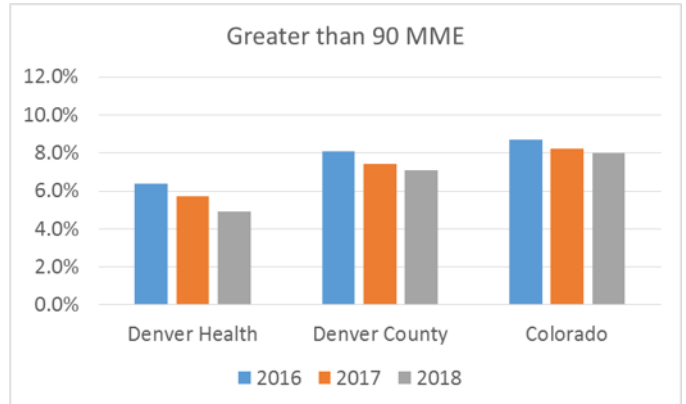
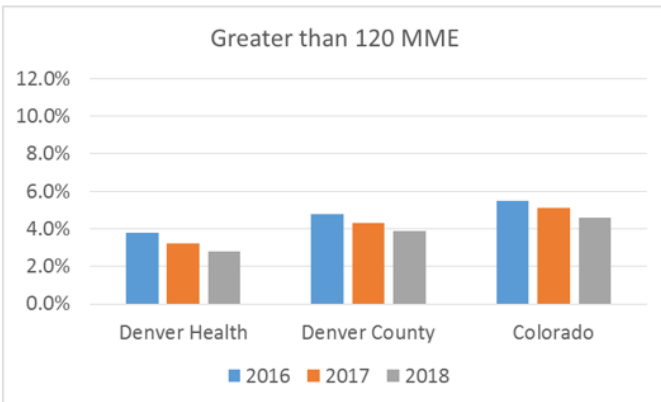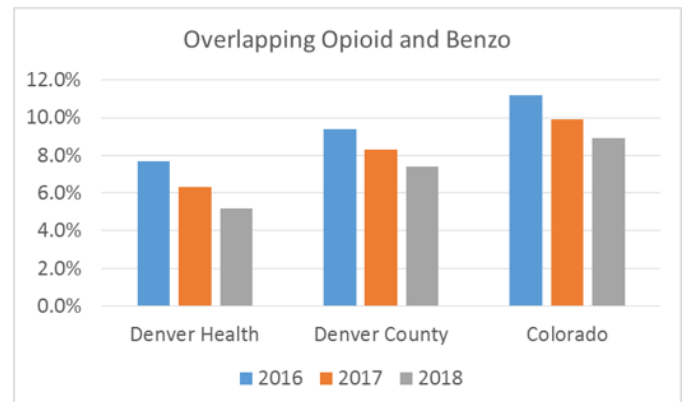Figure 3.3-4: Opioid Prescribing Improvement Efforts

Figure 3.3-5: Opioid Prescribing Improvement Efforts

3.4. COR Zero, ICU Transfers and Bounce Backs

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 patients who require a rapid assessment for the following reasons: change in clinical status; transfer out of an intensive care unit and then return to the intensive care unit within 48 hours; and unanticipated coronary/respiratory arrest while being cared for as an inpatient.

Rapid Response / Escalation of Care
DHHA has a Rapid Response methodology currently in place whereby a nurse will identify a patient who is decompensating and will immediately escalate care to the on-call resident or attending provider. An immediate assessment by the clinical care team will precipitate additional orders and frequently necessitate a transfer to a higher level of care. All transfers from Acute Care to the ICU are formally reviewed by the DPSQ team for any opportunities and to evaluate the effectiveness of the escalation process.

The current Adult Rapid Response process is being reassessed and re-evaluated. Epic has the capability to provide an early warning score (EWS) triggered automatically from documented vital signs, lab values, patient age, etc. This EWS is called the Epic Deterioration Index (DI) model. The goal is to incorporate an electronic early warning system into a rapid response thereby decreasing unexpected mortalities and shortening ICU days. Our goal is to continue to work with Epic and stakeholders to review the accuracy of an early warning score and implement a process for rapid escalation of care.

Intensive Care Unit Transfers and Bounce Backs
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 decreased from 41 in 2016 and 2017 down to 34 in 2018 (Figure 3.4-1). An analysis of the 34 cases did not demonstrate any particular trend.

Transfers from acute care to ICU increased to 342 in 2018 from 298 in 2017. After a careful analysis of the cases, the contributing factors for these transfers were respiratory condition, cardiac condition, and sepsis co-morbidity.

Transfers from ED to acute care to ICU decreased from 107 in 2017 to 89 in 2018. This reflects an improved process for identifying the appropriate level of care when patient's leave the emergency department.

Figure 3.4-1: ICU Transfers 2010-2018
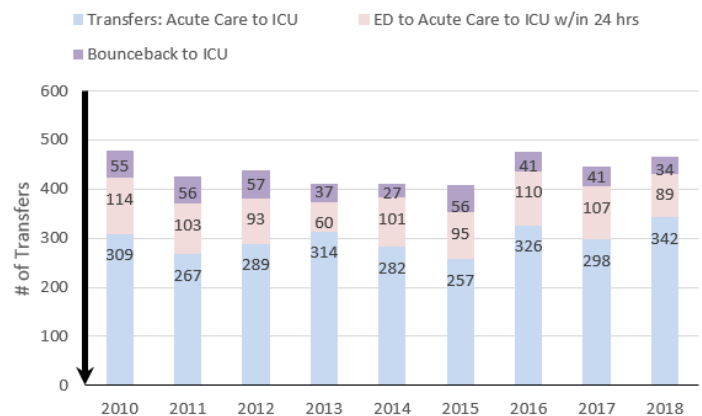
COR Zero
A review of all medical emergencies and surrounding processes is conducted by the Code Blue Committee. In 2018, there were 27 "Code Blue" events (Figure 3.4-2). An increase in severity of illness can be one factor in the increase in Codes as well as patients decompensating quickly. DHHA strongly supports and believes that a robust early warning system which assists nurses and physicians with identification of decompensating patients will decrease preventable harm on the units.

In 2017, DPSQ identified that the OB Screening Room and the Cath lab were two areas with a low incidence of Code Blue. This led to ongoing education and competency training for these areas. In 2018, "mock code" drills were completed to help these units prepare for an actual event. A process specific for the Cath lab on escalation of care was put into place.

3.4-2: Acute Care COR Zero / Code Blue Events
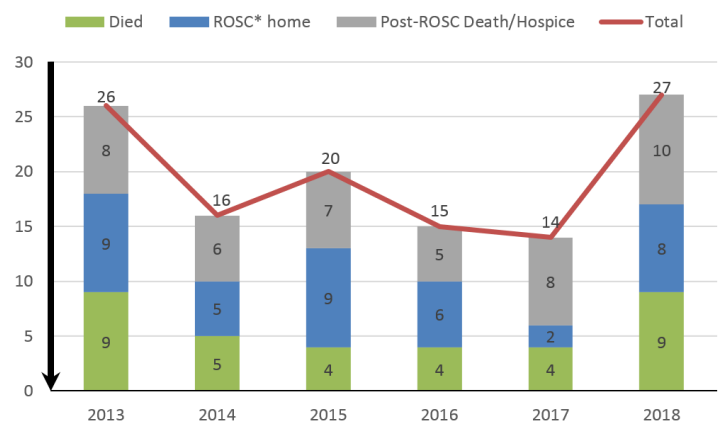
*ROSC: Return of spontaneous breathing

3.5. Procedural Sedation

Procedural Sedation is a high-risk intervention that requires well written guidelines for physician, nurse and respiratory therapy training, practice, and ongoing competency. These procedures are performed by non-anesthesiologists for planned sedation cases on non-intubated patients. Documentation is analyzed to facilitate and support practice as well as to follow-up for performance improvement.

The Procedural Sedation Committee reviews data and makes recommendations to ensure ongoing performance improvement. Figures 3.5-1 and 3.5-2 display the bundle pass rate for outpatient and inpatient documentation. In April 2016, documentation of procedural sedation was converted from a paper format to an electronic format with the imple- mentation of Epic. A dramatic drop in comprehensive documentation occurred with Epic requiring reeducation of providers. These efforts to optimize the electronic documentation are showing major improvements in both the inpatient and outpatient areas.

Figure 3.5-1: Outpatient Procedural Sedation

Procedural Sedation Documentation
Outpatient Areas

Outpatient areas include: Cardiology, GI Lab, Interventional Radiology (IR), ED, Pediatric Emergency Department and Urgent Care (PEDUC), Oral and Maxillofacial Surgery (OMFS), Bronchoscopy Lab, and Winter Park Medical Center
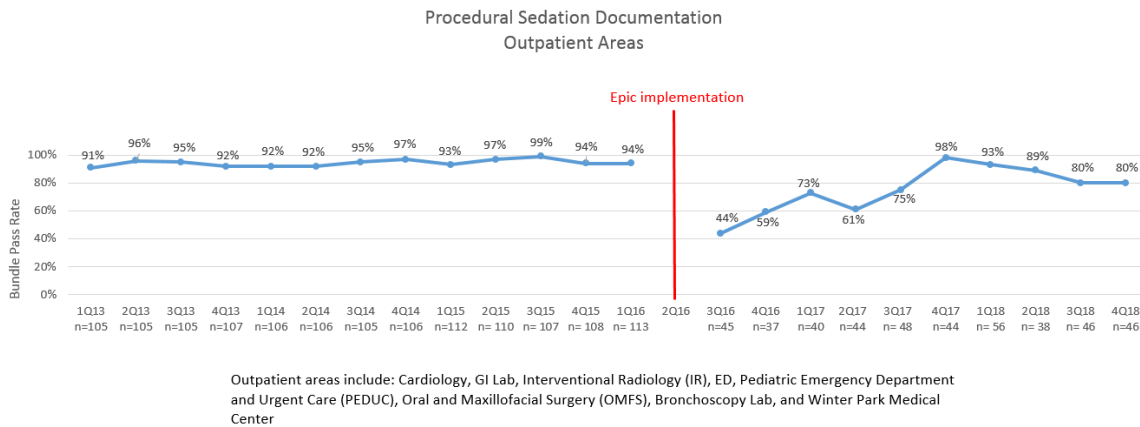
Figure 3.5-2: Inpatient Procedural Sedation

Inpatient units performing procedural sedation: MICU, PICU, SICU, PCU and NICU
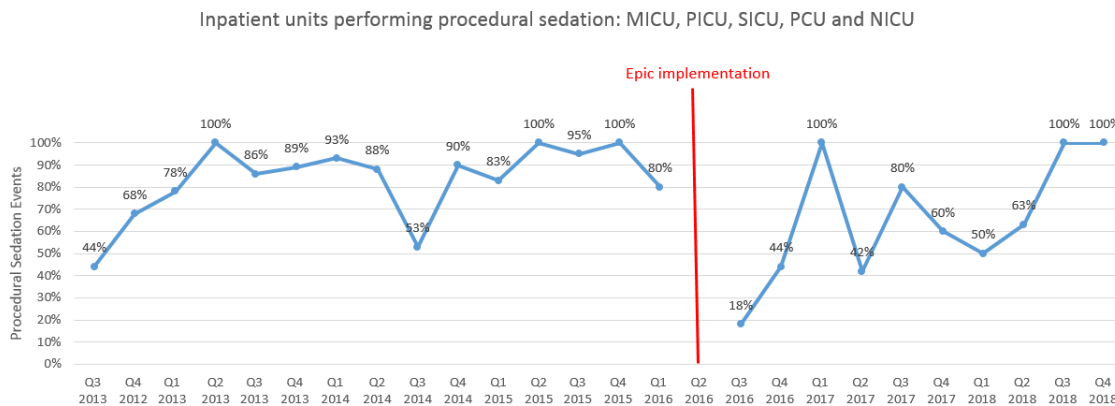
Figure 3.5-3: Procedural Sedation

Procedural Sedation Occurrence/Safety Events

Procedural sedation related safety events are self-reported. The data demonstrate a low percentage of safety events related to procedural sedation (Figure 3.5-3).

Procedural Sedation Events
2011-2018

***Epic implemented 4/9/2016. Unable to determine 2016-2018 total demnominator and estimated using 2015 data

2012	2013	2014	2015	2016	2017	2018
0.68%	0.46%	0.34%	0.22%	0.29%	0.26%	0.21%
Approx. 36 of 5300	Approx. 25 of 5400	Approx. 20 of 5885	Approx. 13 of 5839	***Approx. 17 of 5840	***Approx. 15 of 5840	***Approx 12 of 5840

Percentage of ocurrences
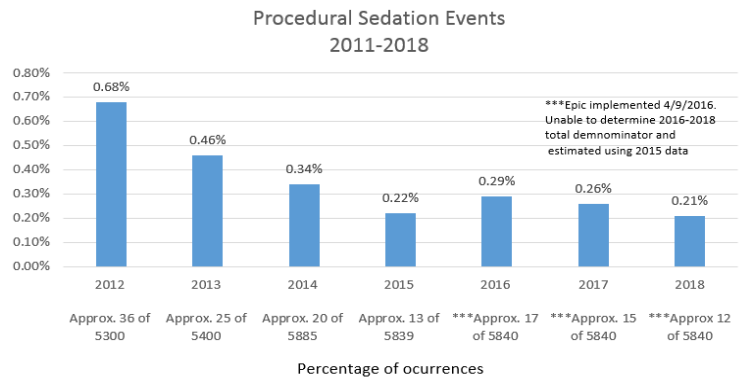
3.6. Standing Orders

The Centers for Medicare and Medicaid Services (CMS) requires that all standing orders and orders by protocol are part of the patient medical record and are evaluated annually for any adverse events. Through collaboration between DPSQ, Epic and Health Information Management (HIM) teams, the process was successfully implemented in 2018.

All staff at Denver Health have access to an anonymous incident reporting system, Safety Intelligence (SI). When an adverse event occurs related to standing orders or orders by protocol, front line staff enter information about the event in SI. Departmental managers and the Patient Safety team investigate the event and determine if the patient harm was an indirect or direct result of a standing order or order by protocol.

In 2018, no patients were harmed by a standing order or order by protocol.   The Epic team continues to be instrumental in working to create a process whereby the standing orders and orders by protocol are entered directly into the patient medical record as required by CMS.

3.7. Diabetes Program

Insulin use and resulting hypoglycemia in the inpatient setting
Insulin has long been identified as a high-alert medication by the Institute for Safe Medication Practices, and is frequently involved in medication-related adverse events that result in patient harm. Using insulin to manage glucose levels during hospitalization helps improve patient outcomes, but also exposes patients to the risk of hypoglycemia. Inpatient hypoglycemia has been associated with higher rates of morbidity and mortality, longer lengths of stay, higher costs, and higher odds of being discharged to a skilled nursing facility.

Denver Health is currently tracking the incidence of severe hypoglycemia related to insulin use through the Hospital Improvement Innovation Network (HIIN). Severe hypoglycemia is defined as a blood glucose (BG) value less than 50 mg/dL after receiving insulin (occurring either the same day or after). Between January 2014 and September 2016, DHHA had 79.4 episodes of severe hypoglycemia per 1000 patients, establishing DHHA in the worst quartile of hospitals participating in Vizient's HIIN (N=200). This baseline poor performance led the inpatient diabetes team to multiple performance improvement efforts in 2018.

1. Direct Nursing Staff Education: The inpatient diabetes team provided numerous live presentations to nurses, routinely sent electronic communications, and created reference materials for dissemination by inpatient diabetes champions.

2. Enhancements to the Electronic Medical Record (EMR): To track treatment of hypoglycemia, new functionality was added within Epic to streamline nursing documentation. By creating a glucose management section within the Input and Output (I&O) flowsheet, nurses can now quickly document hypoglycemia treatment and provider notification, reference the supporting Policy Stat document, and view the hypoglycemia treatment algorithm through an embedded hyperlink.

3. Revisions to the Adult Hypoglycemia Treatment Protocol: The adult hypoglycemia treatment protocol was revised, and a new minimum BG target implemented. Given that hypoglycemia is defined as any BG ≤ 70 mg/dL, it made little sense to view a BG value of 71 mg/dL (especially prior to a meal-time dose of insulin) as perfectly acceptable given all the nutrition-related variables that can result in hypoglycemia. Therefore, the minimum pre-prandial BG target was raised to 80 mg/dL for patients receiving insulin. The rationale for revising the protocol included:
- Provide a margin of safety for patients in the event less food is consumed than planned.
- Increase the confidence of nurses administering meal-time insulin, so insulin isn't held out of concern for hypoglycemia (which then often results in hyperglycemia).
- Align with ADA outpatient recommendations for pre-prandial BG targets, which is 80-130 mg/dL.
- Reduce the likelihood of progressing to a severe low hypoglycemia by proactively treating BG values near 70 mg/dL since point of care (POC) glucose meters typically result within 10% of actual plasma glucose values.

4. Creation of a Pediatric Hypoglycemia Treatment Protocol: Several safety events in the pediatric area highlighted the need for a pediatric-specific, nurse-driven hypoglycemia treatment protocol. This was developed in collaboration with pediatric providers, nursing leadership, and pharmacy.

The HIIN target is to improve by 20% from baseline, which for Denver Health means no more than 63 adverse drug events (ADEs) per 1,000 patients. In 2018, DHHA far exceeded the goal with only 29.71 ADEs and every month beating the goal (Figure 3.7-1).

Figure 3.7-1: Denver Health ADE for Insulin (per 1,000 patients)

	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	Jun 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018
Numerator	8	6	8	5	2	4	8	10	8	3	12	15
Denominator	257	238	268	230	248	230	248	258	224	258	262	275
Average Rate	31.13	25.21	29.85	21.74	8.06	17.39	32.26	38.76	35.71	11.63	45.80	54.55

Legend

Worst Quartile
Above Median
Below Median
Best Quartile

DHHA's incidence of severe hypoglycemia improved considerably from the baseline several years ago. DHHA's severe hypoglycemia rate decreased by 63% in 2018, thereby avoiding 149 cases. With an estimated cost of $5000 per hyperglycemic episode, this represents an estimated savings of **$743,671** to Denver Health for the year (Figure 3.7-1).

Figure 3.7-2: HIIN Adverse Drug Event (ADE) — Severe Hypoglycemia After Receiving Insulin

DHHA Baseline ADE Rate*†	HIIN Target ADE Rate*	DHHA 2018 ADE Rate*	Improvement Rate	Annualized Cases Avoided	Annualized Costs Avoided
79.4	63	29.7	62.6%	148.73	$743,671

* Episodes per 1000 patients
† Baseline period is January 2014-September 2016

Diabetes Program Goals for 2019
The inpatient diabetes team will continue efforts to reduce the rate of severe inpatient hypoglycemia through:
- Ongoing staff education
- Scrutiny and revision of existing hypoglycemia treatment protocols (as needed)
- Data-driven interventions is identify areas where staff my benefit from additional support and education

3.8. Patient Flow Workgroups / Length of Stay

Figure 3.8-1: Implemented Patient Flow Initiatives in 2018

Hospital Capacity Management Plan	Surge plan for when the hospital is experiencing acute care capacity strain. Defines thresholds for specific interdisciplinary interventions. Implemented in October 2018. Plan to optimize in 2019.
Expedite outpatient care for unestablished patients	Created a novel process for scheduling unestablished patients into CHS clinics and newly created Hospital Transition Clinic in a timely fashion. Process went live in July 2018. Goal is to reduce length of stay for unestablished patients and connect them into Denver Health's primary care system. Expanded Hospital Transition Clinic access to ED patients in November 2018 in order to avoid admissions.
Guardianship	Created standard work for communication, collaboration, and documentation when making the decision to pursue guardianship. New Epic tool tracks all of the information needed for a formal guardianship letter to APS and monitors the process through approval/denial with metrics for time taken in each step of the process.
Chest Pain Guidelines	Created interdisciplinary evidence-based guidelines for patients presenting to the emergency department with chest pain. The goal of this intervention was to optimize the risk stratification of chest pain and provide patients the right care, in the right setting, at the right time.
Nursing-Led Mobility Pilot	Partnership with nursing and therapy to create standard work for mobility assessment and ambulation. Piloted on 4B in January 2018. This unit saw a reduction in Length of Stay Index, while not increasing its fall rate. Plan to expand to Medicine units in 2019.
Discharge Lounge	Reinvigorated use of the Discharge Lounge for patients who have been discharged and are waiting for transportation from the hospital. Have seen an increase in utilization in 2018.
Interoperability with Colorado Coalition for the Homeless	Created automatic notification system through EpicCare Link with Colorado Coalition for the Homeless, allowing their providers to know when their patients are admitted to and discharged from Denver Health. Included information about which patients are established with the Coalition, improving

One of the key measures of hospital flow has been the length of stay index (LOSI) calculated using a ratio of observed LOS to the expected LOS based on the patient's final APR-DRG diagnosis, averaged across all patients discharged that month. Figure 3.8-2 shows LOSI monthly with exclusions only for normal newborns, emergent dialysis admissions, and ACUTE eating disorder patients. It has been consistently above 1.0 with an average of 1.15. There has been no significant change during 2018. Since the bulk of the hospital flow efforts have been focused on those beds with the highest occupancy (medical-surgical and adult ICU), the figure 3.8-3 focuses the LOSI metric on that target population. While the LOSI is lower in this subgroup than the total population, it did not change significantly in 2018. The spike in LOSI in May, 2018 was the result of several discharges that month of patients who had observed LOS of >365 days.

Figure 3.8-2: Hospital-Wide Length of Stay Index (for Enterprise Scorecard)
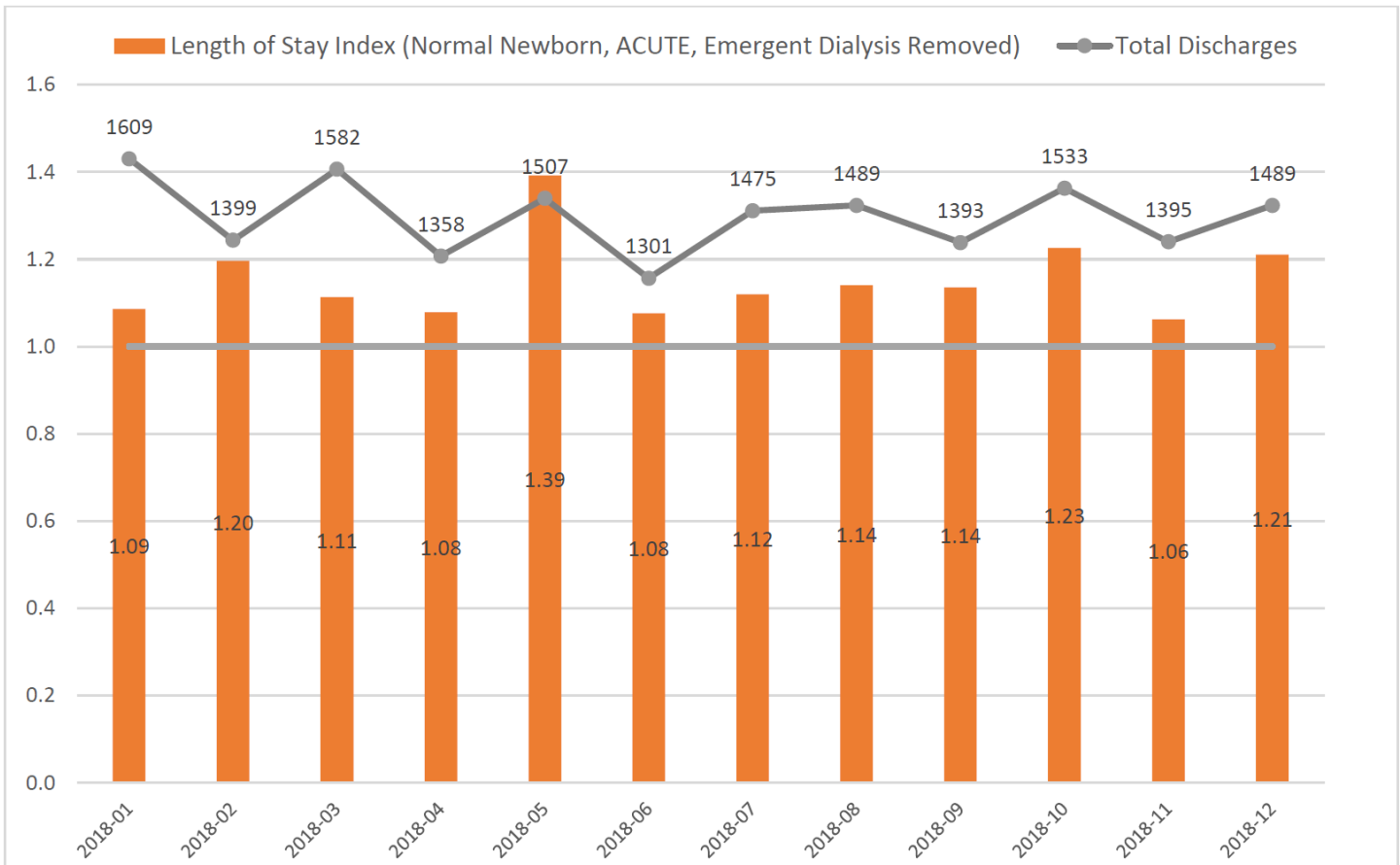
Measure inclusion criteria:
- All inpatient discharges in the reporting month with coding finalized

Measure exclusion criteria:
- Hospital visits which were late combined with other accounts
- Hospital visits discharged from the following departments:
  - DH PAV C WELLBABY NURS
  - DH PAV 5A Acute CNTR / DH PAV M Acute CNTR
- Hospital visits with inpatient emergent dialysis

Length of stay index calculated using APR-DRG AMLOS as expected LOS for each patient based on their APR-DRG

Figure 3.8-3: Hospital-Wide Length of Stay Index
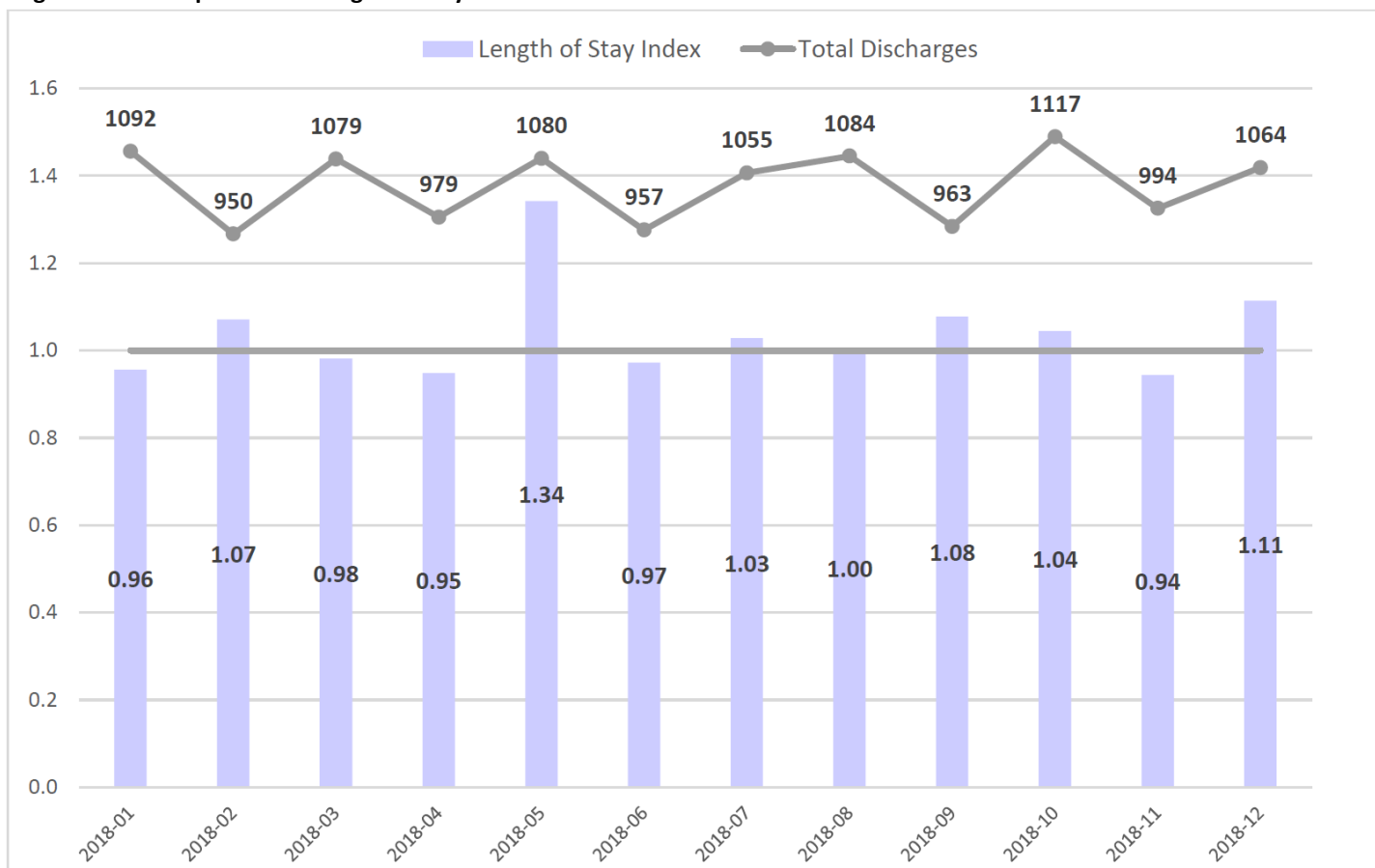
Measure inclusion criteria:
- All inpatient discharges in the reporting month with coding finalized

Measure exclusion criteria:
- Hospital visits which were later combined with other accounts
- Hospital visits discharged from the following departments
  - DH PAV 5A ACUTE CNTR / DH PAV M ACUTE CNTR
  - DH PAV C L&D
  - DH PAV C M-B
  - DH PAV C NICU
  - DH PAV C OBSR
  - DH PAV C PEDS
  - DH PAV C PICU
  - DH PAV C WELLBABY NURS
  - DH PAV C WOMEN'S CARE
  - DH PAV A EPSY / DH PAV A 5A ADLT PSYCH
  - DH PAV A WPSY
  - DH PAV M CHILD / ADOL
  - DH PAV B CCMF IP
  - DH PAV A REHB

Length of stay index calculated using APR-DRG AMLOS as expected LOS for each patient based on their APR-DRG

Plans for 2019

Improving level of care assignment at time of admission from ED
- Creation and implementation of the Hospital Medicine one-call pilot
- This pilot created a hospital medicine triage workflow where hospital medicine providers recommended level of care assignments for all medicine patients.
- The goal is to improve initial level of care assignment accuracy as well as to strengthen the connection from the Emergency Department with the Hospital Transition Clinic.

Length of Stay Improvements
- The goal is to identify discreet DRG-specific interventions and rapidly implement and improve length of stay in these areas.

Hospital Space Planning with a focus on Patient Flow
- The goal is to partner with executive staff and Master Facility Planning to optimize current and future space for Patient Flow.

Collaboration with Colorado Coalition for the Homeless
- Focused collaboration efforts with the Colorado Coalition for the Homeless on opportunities to improve care and reduce length of stay for patients experiencing homelessness

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 nurse sensitive measures. NDNQI is the only national nursing database that provides quarterly and annual report of structure, process, and outcome indicators to evaluate nursing care in promoting high 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 are used to meet regulatory requirements and promote improved quality of patient care.

4.2. Healthcare Acquired Pressure Injuries (HAPI)

Pressure injuries related to moisture issues continue to be an important issue for DHHA in 2018. 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 2018, this team met on March 21st, June 20th, September 5th, and November 28th.

The origin of pressure injuries must be determined (hospital, hospital/unit or community acquired) for patients with pressure injuries. Calculation of the Hospital-Acquired Pressure Injuries (HAPI) rate requires the 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 report of DHHA's HAPI performance against DHHA's comparison group. There were some marked improvements in DHHA's HAPI performance in Q4 2017, Q2 2018, and Q3 2018.

Figure 4.2-1: Point of Prevalence Pressure Injury Outcomes, Stage II and Above

The Wound Care Team introduced multiple initiatives:
- Braden Rounding to assess the utilization of the Braden Score and corresponding interventions was piloted on 3B and 4B. During this pilot, there was a discrepancy in terms of what interventions were documented and what was audited, highlighting the need for further education and to consistently audit these scores. Wound Care Champions are now expected to complete Braden Score Rounding quarterly. This potentially improved prevention of HAPIs.

- The ostomy formulary and processes for introducing new products was revised. This promoted more successful ostomy maintenance and potentially decreased injury to the patient and readmission.

- Began the process of wound photography and pressure injury assessment, introducing new education modules and guidelines. This is currently in the process of approval and will be ongoing work for 2019.

4.3 Patient Falls

Denver Health has a dedication to fall prevention. Fall prevention is one of the components of Target Zero and a requirement for Magnet. The 2018 goal of the evidence-based falls prevention program at DHHA was to reduce the total number of falls by 10%. Preventing patient falls is a complex set of issues that requires a collaborative, multidisciplinary approach utilizing an evidence-based, data-driven implementation process. The falls work that began in 2017 continued in 2018.

Definitions
Falls are defined utilizing the NDNQI definition: "A patient fall is a sudden, unintentional descent, with or without injury to the patient, that results in that 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)."
A thorough adjudication process is done to determine if safety intelligence events classified as a fall meet the above criteria.

Fall Reduction
DH has seen a reduction in falls. Hospital wide, there was a 16% decrease in total falls between 2017-2018, and a 38% decrease between 2016-2018 (Figure 4.3.1). Further, per NDNQI, DH performed better than the benchmark the past 4 quarters. For Quarter 3 2018, DH was among the best quartile of hospitals in total fall prevention. DH met benchmark the last two quarters in injury fall prevention.

Figure 4.3-1: Hospital Wide Falls for 2016 to 2018
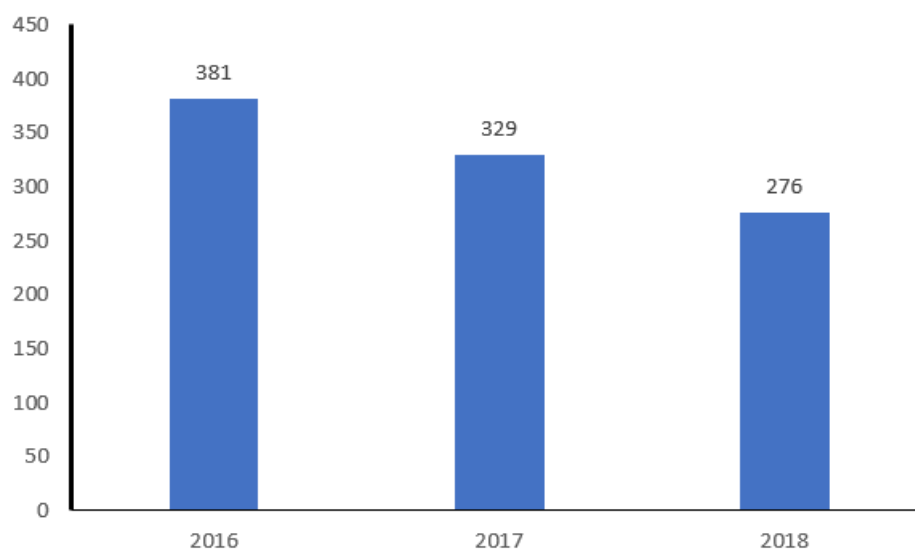
In 2018, there has been progress across each division in either sustaining or developing a falls prevention bundle.

Acute Care Division Fall Prevention

The Acute Care Division implemented the "Big Three" standard work in July 2017. There has been a 38% decrease in total falls per 1000 patient days and a 28% decrease in injury falls per 1000 patient days between the pre-implementation period (July 2016-June 2017) and post-implementation period (July 2017-July 2018) as shown in Figure 4.3-2. The Acute Care Division continued this trend of reduction in the second half of 2018.

Acute Care Division initiatives and work summarized as follows:
- Piloted Fall Audits by Fall Champions on 9A, where total falls per 1000 patient days decreased by 63% between pre-pilot and post-pilot periods.
- Increased awareness and accountability with "Big Three" standard work.
- Validated the use of Hester Davis on the Acute Care Division. Most fallers scored at 12. Validation work suggested a doubling in sensitivity if the score was lowered to 12.

Figure 4.3-2: Acute Care Division Fall Rates Pre-Implementation and Post-Implementation of Standard Work (July 2016-2018)

Acute Care Fall Rates Per 1000 Patient Days (July 2016−2018)
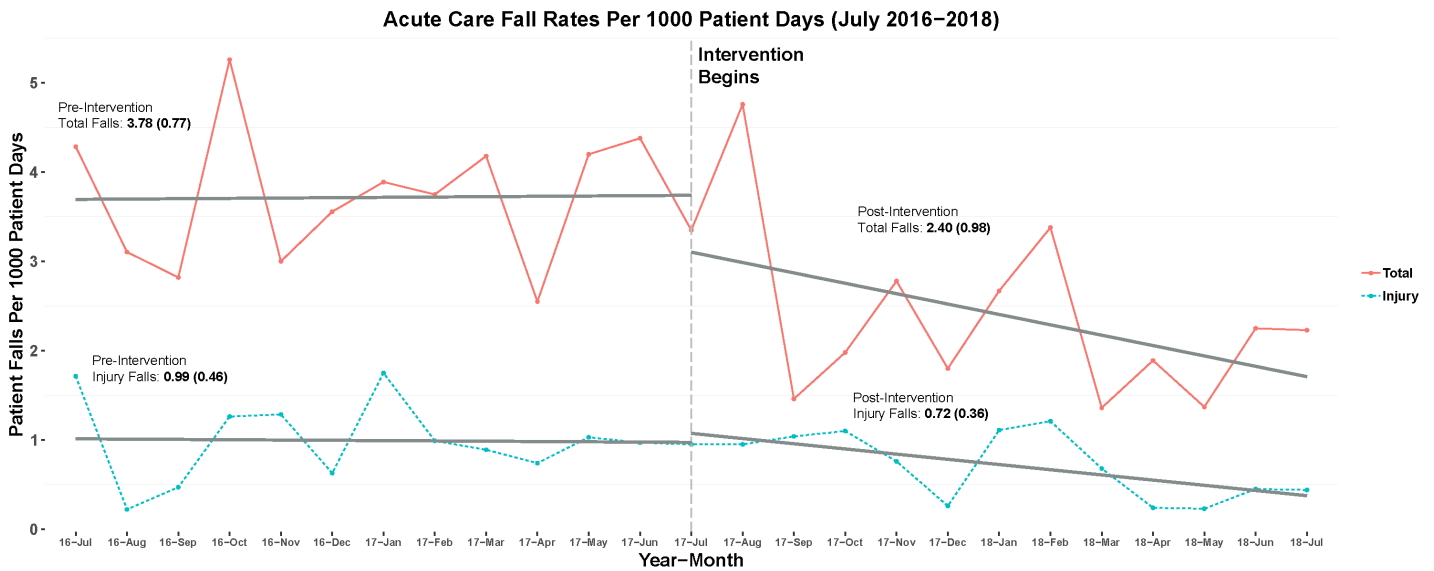
Behavioral Health Division Fall Prevention

Behavioral Health Division towards the latter end of 2017 and beginning of 2018 saw an increase in falls. Work began in the fall of 2017 on developing a Behavioral Health specific falls prevention intervention bundle. Assessing total and injury falls per 1000 patient days between pre-development period (January 2015 to August 2017) and post-development period (September 2017 to January 2019), the division saw a 10% decrease in total fall rates and a 13% decrease in injury fall rates (Figure 4.3-3).

Behavioral Health Division initiatives to prevent falls:
- Introduction of a behavioral health specific falls risk tool.
- Introduced standard work for Occupational Therapy (OT) to evaluate all high fall risk patients.
- Created and implemented a Behavioral Health Division falls prevention standard work.

Figure 4.3-3: Behavioral Health Fall Rates (January 2015 to January 2019)

Behavioral Health Injury Fall Rates Per 1000 Patient Days (2015− Jan 2019)
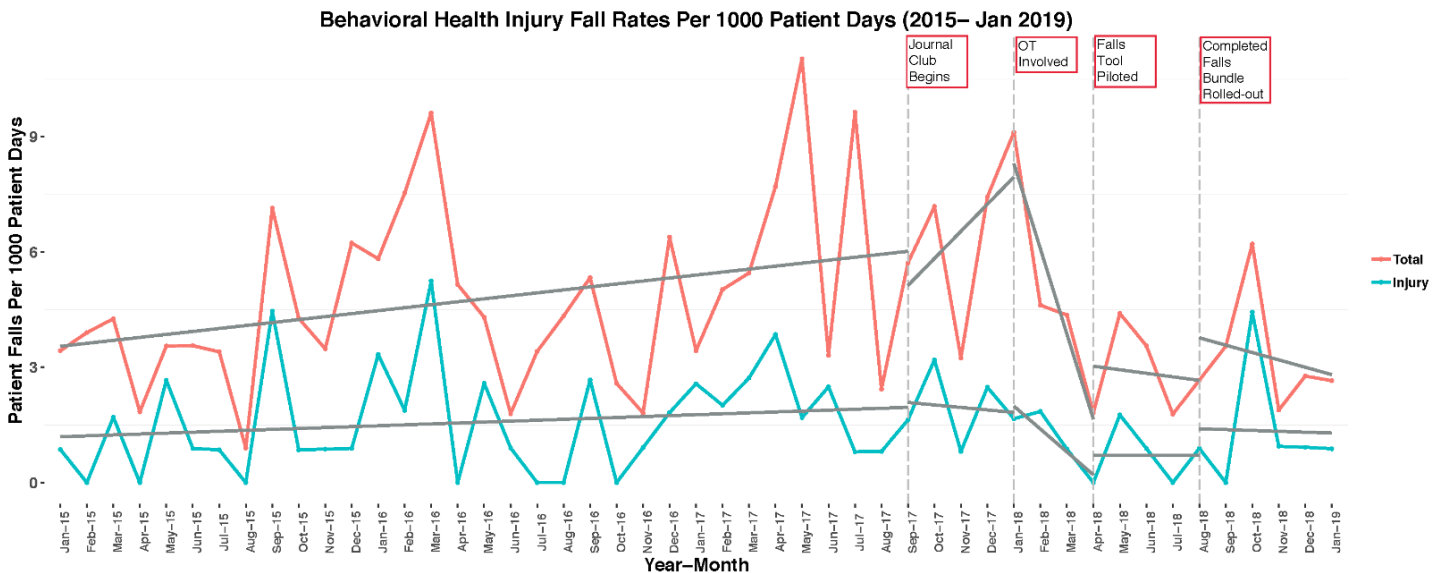
Critical Care Division

Through the EXTREME Falls Program, the Critical Care Division continued to see success on its fall rates. The main goals for the Critical Care Division are to formally evaluate the EXTREME Falls program and to sustain their current fall rates. For 2018, the Progressive Care Unit saw no falls for 300 days.

Figure 4.3-3: Critical Care Fall Rates (January 2005 to December 2018)

Critical Care Fall Rates Per 1000 Patient Days (2005–2018)
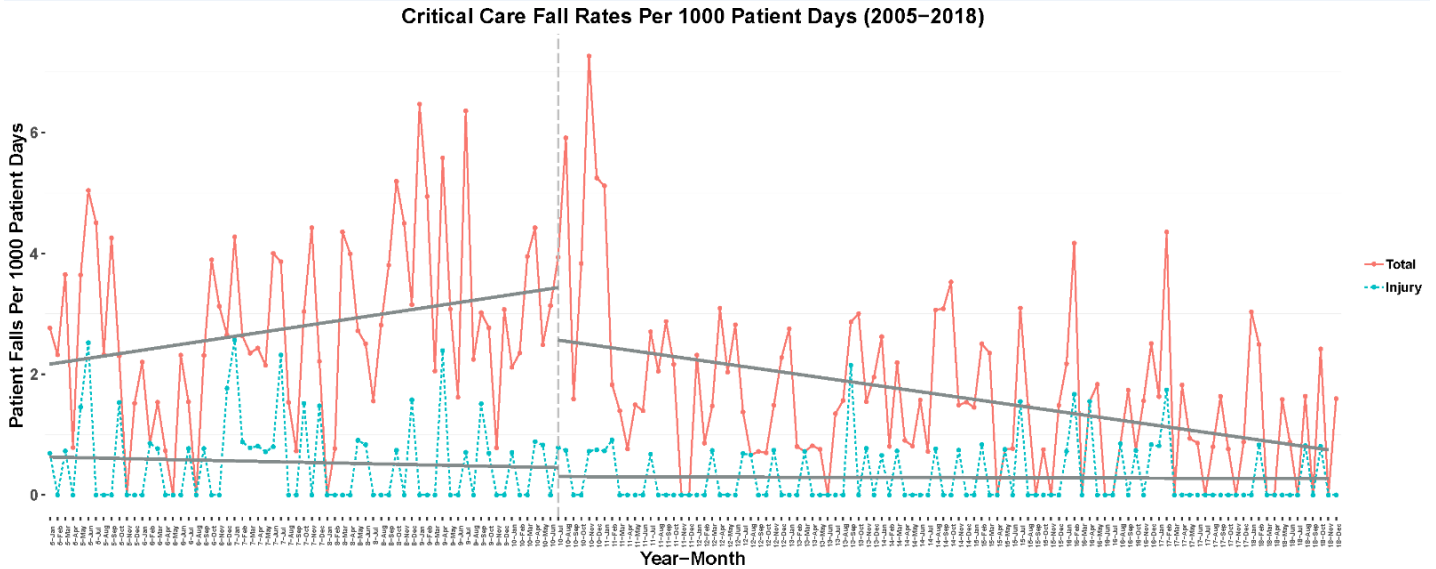
Falls Prevention 2019 Goals

- Total fall number reduction by 5% and injury fall number reduction by 10%.
- Assess common factors associated with injury falls to better understand these falls and implement data-driven interventions
- For the Acute Care Division, reduce Hester Davis High Risk classification to a 12, create standard work documentation in Epic, and create an individualized falls care plan for patients.
- Sustain current initiatives.
- Formal evaluation and publishing of current initiatives.

4.4 Recognition

In 2018, DHHA was one of five Colorado hospitals recognized by Donor Alliance with "Ending the Wait" awards for their outstanding achievements in facilitating the gift of life through organ and tissue donation in Colorado. Donor Alliance is the federally-designated organ procurement organization serving Colorado and the Colorado Hospital Association.

5. OUTPATIENT SAFETY & QUALITY INITIATIVES

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

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 TOC: Transition of care 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 QI and Design Committee (AQIDC)

The 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 AQIDC 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. AQIDC 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 its 2018 target for the Ambulatory Quality Strategic Index Score ($\geq$ 14) based on performance of the 11 Strategic Indicators.

Figure 5.3-1: Ambulatory Quality Scorecard Summary December 2018

	Diabetes A1c < 8 63%	Hypertension BP Controlled 66%	Breast Cancer Screening 63%	Colorectal Cancer Screening 54%	Pediatric Vaccination 60%	Six Well Child Visits Before 15 Months 79%	Well Child Check Rate 3-9 year olds 76%	Weight Assessment and Counseling - Peds 64%	First Trimester Entry in Prenatal Care 64%	Post-Partum Visit 21-56 days 62%	ACS Tobacco Interventions 55%	Enterprise Tobacco Interventions 55%	Ambulatory Quality Strategic Index 14 pts
CHS	60.55% 9,859	63.99% 21,849	59.47% 14,025	55.73% 25,392	53.55% 3,156	79.0% 2,647	74.88% 23,157	68.92% 45,574	66.51% 3,655	65.91% 701	54.67% 3,869	53.17% 5,428	15 pts
Family Medicine Division	60.51% 5,054	63.28% 10,738	60.1% 6,854	53.83% 12,024	48.81% 1,346	75.95% 1,164	71.95% 9,300	61.59% 16,205	64.8% 1,605	66.19% 281			
General Internal Medicine Division	60.84% 4,683	64.42% 10,689	59.85% 6,972	58.11% 13,169	80.0% 35	84.0% 25	73.41% 503	64.81% 252	81.82% 33	100.0% 12			
General Pediatric Division					56.74% 1,766	81.28% 1,453	77.19% 13,119	74.42% 24,224					
School Health Division							69.34% 486	66.41% 4,626					
Women's Care Division			24.12% 199	12.56% 199					67.63% 2,017	64.71% 408			

Diabetes Control

Percent of adult patients in the diabetes registry whose last hemoglobin A1c was below 8.0%. DHHA's diabetes registry has grown by over 500 patients over the past year.

- Efforts were driven by the Diabetes workgroup who developed a multi-pronged approach to improving diabetes management.
- Strategies included provider education of new guidelines (specifically new diabetes medications), utilization of medical-therapy-management with clinical pharmacist, incorporation of Diabetes Self-Management Classes and nurse insulin titration clinics.
- This has led to DH's best performance since tracking this metric. ACS continues to improve upon these strategies by working with Epic to develop and implement tools to facilitate improvement.

Hypertension Control

Percent of patients in the hypertension registry with the most recent blood pressure in ACS in last 18 months < 140/90 mmHg (age < 80) or < 150/90 mmHg (age ≥ 80). The number of patients in DHHA's hypertension registry has grown by nearly 2,000 patients over the past year.

- DH continues to see seasonal variation in blood pressure control with the best performance in July-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.
- In addition to patient factors (e.g., non-adherence with medication and lifestyle), there appears to be hesitancy for medication intensification.
- Similar to diabetes, ACS will work with Epic to develop reports looking at appropriate medication intensification and follow up. This information will be given to clinics with recommendations for potential strategies to improve control.

Breast Cancer Screening

Percent of active female patients age 51-74 years with a mammogram in the past 2 years. The number of patients has increased by nearly 1,000 patients over the past year.

- The Cancer Screening workgroup lead DH's efforts for this metric and piloted a number of interventions with minimal success. These include text-messaging or MyChart reminders to patients to schedule mammograms to medical assistants scheduling mammograms at check-in during the visit.
- ACS is working with Epic to develop reports to monitor adherence to medical assistant standard work with regard to utilization of "Best Practice Alerts" to order/schedule mammograms at the clinic visit. Initial evaluation suggests that this may be the most effective intervention but it is unknown how well it is being implemented.
- DH has seen a slow but consistent improvement in breast cancer screening rates from 58.1% to 59.5% over the past year.

Colorectal Cancer Screening

Percent of active adult patients age 51-75 years with 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 nearly 1,000 patients in the past year.

- The Cancer Screening workgroup led efforts for this metric and identified key issues with the data, specifically identifying co-lonoscopies which were performed for outpatients.
- Correction of the colonoscopy documentation increased compliance, which was noted in the July improvement in performance.
- In addition to the data correction, DH continues to see a steady improvement in this metric. This improvement is believed to be a result of outreach efforts to patients who have not returned their FOBT kit. This was performed in two clinics with coordination with Epic using "bulk communications." The process will be disseminated to other clinics in 2019.

Pediatric Vaccination (Combo 10)

Percent of patients who received 4 DPT, 3 Polio, 1 MMR, 3 HIB, 3 Hepatitis B, 1 Varicella, 4 Pneumococcal immunizations, 1 Hepatitis A, 2 Rotavirus, and 2 Influenza by 24 months of age. Children who were not seen at a Denver Health clinic before their 2nd birthday are excluded.

- The Pediatric QI workgroup along with the Immunization workgroup led efforts to improve this metric.
- Performance on this metric was hindered by "missed opportunities" which could not be corrected since a few of the vaccines are dependent on time of year in which it is administered. As an example, once a child missed the flu vaccine there was no chance to "make-up," the patient is then non-compliant with the measure the rest of the year.
- 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.
- DH saw a minimal increase in adherence to this metric from 52.4% to 53.5% in the past year.

Six Well Child Visits before 15 months of age
Percent of active pediatric patients, with at least 1 well child check at or after age 1 month and who turned age 15 months during the previous 12 months, who had 6 or more well child checks by age 15 months. Prior to January 2019, this measure only included kids born at Denver Health.
- The Pediatric QI workgroup led efforts for this metric and identified key issues with the data, specifically adequate documentation and scheduling visits.
- During the year there were data issues due to not accounting for all the patients seen at Denver Health. This was corrected in mid-summer.
- DH achieved its target by year's end with the main focus on developing processes to improve the scheduling process to help ensure that patients attend the visits.

Annual Well Child Checks for 3 – 9 year olds
Percent of active 3-9 year old patients who have had one well child check in the past year.
- The Pediatric workgroup led efforts for this metric, with efforts focused on making sure patients were scheduled for there annual appointment.
- Majority of the improvement was demonstrated in the Pediatric clinics with clinics achieving target goals.
- Although only one Family Medicine clinic reached the target for this metric, the overall trend improved in the past 4 months but did not reach the target set for the year.

Pediatric Weight Assessment and Counseling
Percent of 3-17 year old patients who had a BMI percentile, documentation for nutrition and activity counseling in the past year.
- The Pediatric QI workgroup along with the Weight Management workgroup focused on these efforts.
- The main issue in this metric was appropriate documentation of the process. Feedback from providers noted that they counseled patients and their family at nearly every visit.
- The focus during the year was educating providers on the appropriate documentation process in Epic, which led to a steady increase in performance and the overall metric reaching its "Stretch Value".
- The Weight Management workgroup collaborated with clinics to create and identify resources for patients and families. This included educational group visits in the MEND program and initiating Healthy Lifestyle Clinics.

First Trimester Entry into Prenatal Care
Of the pregnant women whose received care at Denver Health during the calendar year, the percent whose OB intake date occurred less than 13 weeks into their pregnancy.
- The Perinatal workgroup led efforts for prenatal care, with the main focus making sure that patients have access to clinic appointments and are scheduled in a timely manner.
- The Perinatal workgroup focused on processes both in the Family Medicine and Women's Care Clinic which had unique resources in their respective clinics.
- Efforts were focused on making sure that there was a follow up call by either a nurse or patient navigator after being identified as being pregnant.
- DH was able to reach its "Stretch" value for this target midway through the year and performance then leveled.

Postpartum Care
Of women who had an OB intake visit and a subsequent live birth at DH in the reporting period, the percent who had a postpartum follow visit between 21 and 56 days after birth.
- The Perinatal workgroup led efforts for this metric care, including the implementation and dissemination of their "Postpartum Right Time Right Place" initiative.
- The main focus is making sure that patients have access to clinic appointments and they are scheduled in a timely manner.
- DH was able to reach its Stretch value midway through the year, but then there was a decline. ACS is in the process of identifying the reason for this decline

Tobacco Cessation Intervention
Percent of patients who are ≥ 11 year olds who smoke, were seen in the reporting month and received a cessation intervention in 6 months prior to their visit.
- The Tobacco Cessation workgroup led efforts in this metric. The focus continues to be interventions towards smoking cessation, such as referral to smoking cessation clinic, advice at the clinic visit, prescription for smoking cessation medication and/or referral to the Colorado QuitLine.
- During the year, the "intervention performance measure" continued to improve but at slower rate. DH saw an improvement from 50% to 54.7% in ACS.

- These efforts have continued to improve the smoking prevalence which was at 19.3% which is about a 1% decrease from the previous year. This 1% decline per year has continued over the past 3 years and has been recognized by the Colorado Department of Health and Environment as a model for other organizations.

5.4 Medical Neighborhood

ACS continued its efforts on the Medical Neighborhood which has improved the referral process to specialty clinics. The focus is "closing the gap" – communication between the Specialists and the Primary Care Provider. These efforts led Denver Health specialty clinics to achieve a Patient Centered Specialty Practice recognition by CMS. CMS has also recognized DH's ENT clinic as achieving a TCPI Exemplary status. The ENT Clinic's efforts were recognized at the 2019 CMS Quality Conference for their achievements in patient care, specifically identifying patients needs which led to avoidance of emergency department visits and projected cost savings.

6. ACCREDITATION

6.1. Bariatric and Metabolic Surgery Accreditation

The bariatric surgery program at Denver Health underwent a one-day site survey for accreditation as a Comprehensive Center by the American Society of Metabolic and Bariatric Surgery on June 26th, 2018. The program passed the survey without any deficiencies, and is accredited as a Comprehensive Center as of August 2018. In preparation for this survey, the program undertook an extensive standardization of clinical pathways, bariatric-specific equipment purchasing, outcomes analysis, and underwent a mock survey on May 25, 2018. The mock survey identified areas of opportunity for improvement and provided Denver Health with recommendations to strengthen specific standards. Some examples of improvement processes as a result of the accreditation process include: development of bariatric surgery-specific credentialing guidelines, development of clinical pathways and educational materials available on Denver Health's intranet, universal educational modules surrounding patient sensitivity and recognition and management of complications, purchasing of bariatric-specific equipment (including weight appropriate toilets in bariatric patient areas, and weight appropriate chairs in bariatric patient areas), and submission of all outcomes data to a national registry. Also, in June 2018 Denver Health hired a Metabolic and Bariatric Surgery Clinical Reviewer. This person is dedicated to entering timely and accurate data into MBSAQIP to ensure quality improvement and enhance patient safety.

6.2. Ambulatory Joint Commission Laboratory Survey

The Joint Commission lab surveyors arrived on December 11, 2018 with two surveyors for four days. The comprehensive on site visit identified areas of opportunity for improvement and provided the lab with recommendations to strengthen specific standards. The majority of findings were related to Environment of Care, and as of February 16, 2019, all of these citations have been corrected. The survey also identified incorrect Epic reference ranges that spanned across the organization. The most notable citation centered around NPSG.01.01.01 on the use of two patient identifiers which led to heightened involvement with executive staff and the leadership team. Two areas of improvement recommended, but not actually cited, were surrounding competency assessment of both lab and non-lab staff and Human Resources files. Action plans were implemented improving the care and safety of our patients. The laboratory received full accreditation and this accreditation cycle is effective beginning December 13, 2018 and is customarily valid for up to 24 months.

6.3. The ACUTE Center for Eating Disorders—Anthem Center of Excellence

Anthem Health designated The ACUTE Center for Eating Disorders as a national center of excellence for medical treatment of severe and extreme eating disorders. ACUTE is internationally recognized for its excellent quality of complex medical care for the most medically compromised eating disorder patients. ACUTE is the first medical unit to receive this Center of Excellence designation in the field of eating disorders.

6.4. Failure Modes and Effects Analysis (FMEA)

The Department of Patient Safety and Quality in collaboration with the following departments, Pharmacy, Purchasing and Nursing, conducted a Failure Modes and Effects Analysis (FMEA) prior to the implementation of BD Alaris pump upgrade. In 2017, it was determined that Denver Health should upgrade their IV pumps in terms of functionality and adaptability. The old pumps required intense resources to ensure that the medication libraries were current and up to date. Delays in loading the data into the pumps created safety concerns that could lead to infusion errors which could result in preventable patient harm.

The project initially was to incorporate the NICU and expand to PAV C. Due to favorable financial negotiations with BD Alaris, it was determined by executive leaders to purchase the pumps for the entire hospital. The Kick Off occurred on December 5, 2017. The anticipated roll out occurred in April 2018 with a robust plan for nursing education. The project ran from December 2017 through September 2018.

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:
- Patient Safety
- Education (nurse, pharmacy)
- Clear policies, procedures and/or guidelines
- Equipment concerns

Possible effects of failure:
- Preventable patient harm
- Delay in patient care and services
- Patient and family dissatisfaction and frustration
- Employee dissatisfaction and frustration

Project Goals:
- Reduce potential for patient harm
- Mitigate delay in care by appropriate education/training
- Patient, family, and employee satisfaction

Strategies focused on:
- Education for end-users utilizing super users and in depth training modules, hands on practice, and competencies
- Appropriate resources for pharmacy library upgrades by ensuring staff availability
- Proper care of equipment

Indicators/Metrics:
Monitoring for events through Safety Intelligence (SI) Report Out on the daily Patient Safety Briefing Call

Outcomes:
Events were entered into the SI Event system and reviewed daily during go-live. There was no harm to patients during the implementation of the new pumps. Mitigation plans were all in place and utilized appropriately. As Go-Live approached, it was determined the End Tidal CO2 (ETCO2) equipment was not ready to be implemented and additional training needed to be developed. Therefore, the ETCO2 portion of the project was placed on hold.

6.5. 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 chapter is composed of seven sections:

1. Safety: Address risks in the physical environment, staff safety, construction safety, product recalls, and smoking.

2. Security: Address overall security, access to sensitive areas, response to events, and other issues where staff, visitors, or patients may be at risk.

3. Hazardous Materials and Waste: Address the risks associated with hazardous chemicals, radioactive materials, hazardous energy sources, hazardous medications, and hazardous gases and vapors.

4. Fire and Life Safety: Address risks from fire, smoke, and other products of combustion; fire response plants; 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.

5. Medical Equipment: Address selection, testing and maintenance of medical equipment and contingencies when equipment fails.

6. Utilities: Address inspection and testing of operating components, control of airborne contaminants, and management of disruptions.

7. Emergency Preparedness: Address how the hospital will respond and sustain during large disasters.

Below are some accomplishments within the EOC program during the calendar year 2018:
- Significant progress was made on upgrading all inpatient behavioral health units to remove ligature and safety risks. The project is still ongoing, slated for completion in May, 2019.
- Following a comprehensive eyewash assessment, many of the eyewash stations throughout the facility were upgraded to bring them into present day compliance.
- Pre-employment drug testing began.
- A new temperature monitoring system was rolled out for critical refrigeration.
- After working with the Denver Building Department and Denver Fire, began to lock the stairwell doors in the adolescent psychiatric unit to preclude patients from eloping.
- Additional efforts to reduce impact to the environment went live in 2018, including:
  ◊ Composting in the kitchen
  ◊ Moved to reusable sharps bins to reduce plastic volumes entering the landfill in both inpatient units and ACS clinics.
- Expansion and training of the decontamination team continued.
- DH actively participated in, conducted, or responded to 31 drills/events.
- Started quarterly training for emergency response with Administrators on Call.
- Conducted fire training and scenario based exercises with OR staff.
- Implemented new software for Environment of Care rounds that has increased accountability.
- Consolidated regulatory compliance within Facilities Department to the Director of Safety to have central monitoring and escalation.
- All but two performance indicators were met or exceeded.
- Received a grant to coordinate behavioral health evacuation exercises and development of plans for metro area hospitals.

6.6. Emergency Management Program

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

Scope:
The primary components included in the EMP are Denver Health, Ambulatory Care Services, Behavioral Health Services, and all other leased or owned buildings that Denver Health employees occupy. Close coordination is maintained with the Denver Health Paramedic Division, Denver Public Health, and the Rocky Mountain Poison and Drug Center to ensure a comprehensive and coordinated response to an all-hazards event of any size.

The Emergency Operations Plan (EOP) is the document that outlines response procedures for specific incidents with special attention to the Joint Commission's Six Critical Areas: Communication, Resources and Assets, Safety and Security, Staff Responsibilities, Utility Management, and Patient Care. The EOP is an "all-hazards" plan compliant with the National Incident Management System (NIMS).

Performance:
Several initiatives were undertaken and continued in Emergency Management in 2018.

1. Emergency Operations Plan (EOP)
Annual updates to the EOPs for the Hospital, Ambulatory Care Services (ACS), and Denver Health Winter Park Medical Center.

2. Required Emergency Response Real-world Events, Exercises, and Drills
Ambulatory Care Services (ACS) conducted lock-down drills at each of the nine Community Health centers, in addition to testing the response of staff in High Risk Patient (Special Pathogen) identification in three of nine ACS clinic locations.

Denver Health Winter Park Medical Center participated in a community-based exercise involving the center, local public health department and DHMC in identifying a "Person Under Investigation" (PUI) for a high risk Pathogen and communicating to the appropriate internal/external agencies.

Denver Health met its Regulatory requirements for 2018.
- On March 29th, DHHA conducted a surge exercise of the Emergency Department and facility to test the Emergency Department's ability to decompress the ED, triage patients, and move patients to OR/ICU while testing the disaster mode in Epic production.
- On July 29th, Denver Health received an unannounced Person Under Investigation (PUI) suspected of having Ebola. The Hospital Command Center (HCC) was stood up to manage the incident and coordinate with first responders, Public Health (city/state), Denver Office of Emergency Management and CDC.

Effectiveness:
Emergency Management fully met 3 goals and partially met 2 goals in 2018. See next page for a chart of goals.

Figure 6.6-1: Emergency Management Goals

Goals & Performance Indicators	Year End
Update the Mass Casualty Incident Plan to include new best practices*	◯ GOAL PARTIALLY MET Planning meetings were held and gaps were identified, but plan was not fully updated in 2018. This goal is rolling over to the 2019 calendar year and is ranked number one in the Hazard Vulnerability Assessment conducted for the 2019 calendar year.
Develop a Hazardous Emergency Response Team to include both clinical and non-clinical staff*	● GOAL MET The HERT team added 15 volunteer members. The make-up of volunteers includes both clinical and non-clinical personnel from departments all around the Denver Health System.
Achieve 100% completion/ resolution rate of After Action Items*	◯ GOAL PARTIALLY MET ■ 91% completion rate (119 out of 131) achieved during the 2018 calendar year (14% increase from 2017) ■ 9 of 131 after-actions items totaling 7% will be carried over to the 2019 calendar year. ■ 3% of the after-action item recommendations have been removed from the list due to inability to complete and/or requiring external agency change.
Conduct quarterly AOC training 4 of 4 quarters in 2018 (100%)*	● GOAL MET 4 of 4 quarterly Administrator on Call (AOC) trainings were conducted during 2018 with 100% of the AOC's having attended one or more training sessions during the 2018 calendar year.
Complete annual evaluation of Emergency Operations Plan (EOP) for the Main Campus and CHS*	● GOAL MET The hospital, ACS, and DHEGEUCC EOP's were evaluated and updated in the 2018 calendar year.

*Point of contact: Jeremy Cooke

In addition to the above goals and performance measures, the following significant accomplishments were achieved:
- In collaboration with Mental Health Center of Denver (MHCD), received grant to coordinate a behavioral health evacuation seminar, workshop, and function exercise.
- Conducted several Roving Active Shooter Huddles, and over 15 Emergency Management related trainings in 2018.
- Beyond the two required drills/events, Denver Health actively participated in, conducted, or responded to 31 drills/events. Included in this number are:
  - ◊ 3 Hospital Command Center set-up drills
  - ◊ 2 Real-world ACS Clinic Lockdown Situations
  - ◊ 4 Ebola Quarterly exercises
  - ◊ 1 Methadone Clinic Relocation Drill
  - ◊ 1 Power Outage (wind Storm) impacting the main campus
  - ◊ 1 Code Pink drill
  - ◊ 1 Unannounced Pathogen exercises.
  - ◊ 9 Lockdown drills conducted at FQHC
  - ◊ 1 Real-world Surge Event (Unannounced PUI patient)
  - ◊ 1 Emergency Department Surge Exercise
  - ◊ 2 Network / Phone Outages
  - ◊ 2 Actual Fire Responses
  - ◊ 2 Community-based "Communication" Exercises
  - ◊ 1 Ancillary Community Based Exercise

Emergency Management Goals for 2019:
- Submit final draft of Mass Casualty Incident (MCI) Plan by end of calendar year.
- Conduct at least two Hospital Incident Command Center training sessions.
- Develop an exercise for a full-scale MCI event.
- Update and replace Emergency Quick Reference Guides.

7. CLINICAL DOCUMENTATION INTEGRITY (CDI) QUALITY INITIATIVES
7.1. Patient Safety Indicators (PSIs) & Hospital Acquired Conditions (HACs)

The Clinical Documentation Integrity (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 record is reviewed to determine if the documentation supports the code assignment that triggered the safety or quality indicator.

Background
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 PSIs and HACs are accurately reported. The CDI team reviews PSIs that are included in the PSI 90 composite as well as select PSIs that are not included in the PSI 90 composite.

Methodology
Once the hospital discharge 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 CDI member checks weekly. Each record is reviewed 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. CDI staff also determine if the patient has any potential exclusion criteria and if the 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 cases reviewed by the CDI team 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. The CDI team collaborates with a surgeon who performs 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 15% of PSIs and 14% of HACs that were reviewed in 2018. The main reason for the aversion was multifactorial. Some cases had coding opportunities. Others required a query to the physician when the documentation conflicted with 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.

Summary
The review process has been successful. 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." Prioritizing reviews based on the SOI/ROM allows for timely review selection. The goal is to determine if there are documentation or coding opportunities that would more accurately reflect the patient's admission SOI/ROM or Vizient mortality risk adjustment calculation. The Vizient expected mortality scores are not available until up to 1.5-2.5 months after the patient is discharged. However, the discharge SOI/ROM is readily available after the record is coded.

Background

Mortality indices 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 chronic conditions that are present on admission and have been shown to have a statistically significant impact on mortality.

Risk Adjusted Mortality Index = # 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.

Methodology

The CDI team uses 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 CDI staff review the accounts prior to claim submission. The CDI team also reviews the Office of Decedent Affairs death log to ensure that all admissions meeting criteria have been reviewed. The CDI Specialist reviews the case and determines if there are coding or documentation opportunities taking into account specifically SOI/ROM opportunities and risk adjustment opportunities. If any cases were not reviewed pre-bill that meet criteria to be reviewed, they are reviewed post-bill and the claim is resubmitted if any coding changes are made. The reviews are tracked in Epic and discrete review data is also entered in a secure SharePoint 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 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 CDI to reconcile.

Results

Fifty-eight accounts were reviewed in 2018 for mortality. Eighteen of the accounts were sent to coding for review.

Summary

The CDI team will continue to review all inpatient deaths that meet the SOI or ROM criteria. Along with the current review process, the CDI team will continue to provide education to providers regarding documentation opportunities that will impact accurate reporting of patients' severity of illness, risk of mortality, and risk profiles.

7.3. Outpatient CDI

In 2017, Denver Health piloted an outpatient CDI program. The pilot program focused on the DHMP Medicare Advantage population in two clinics (Geriatric and Westwood). Due to its success, the program expanded in 2018 to two additional clinics. The Intensive Outpatient Clinic (IOC) was added in May 2018 and the Westside Clinic was added in August 2018.

Part 1

Using data supplied by DHMP, specific HEDIS screenings (mammogram, colorectal screenings, diabetes mellitus eye exam) are identified as current, overdue, encounter without a claim, or claim without an encounter. CDI staff reviewed the legal medical record to locate and report the screening findings to the DHMP Program Manager in charge of that HEDIS measure. If there was a true lag in care (i.e. patient was overdue for screening), the CDI team emailed the provider that a screening was needed in a patient with an upcoming appointment.

Part 2

Using data supplied by Population Health, the CDI team focused on HCCs that were captured in the year prior (2017) that had not been captured in the current calendar year (2018). If a chronic diagnosis had not been captured this year and the diagnosis will affect the risk adjustment of that patient, the CDI staff would query the provider one day prior to the scheduled appointment. If the diagnosis was documented, the CDI team tracked the coding to verify capture. Once captured, CDI staff calculated the associated risk adjustment factor (RAF) that was added to the patient's overall risk adjustment score.

Results

- CDI reviewed 998 total records from the four clinics. Out of those records, 1,021 queries were issued, with 505 having an agreed and documented, with added RAF to the patient.
- Total RAF gained from CDI answered queries: 154.98 (Figure 7.3-1)
- Average increase in RAF per patient reviewed by CDI: 0.30 (Figure 7.3-2)

Figure 7.3-1: Impact of CDI Team on Total Risk Adjustment Factor (RAF)
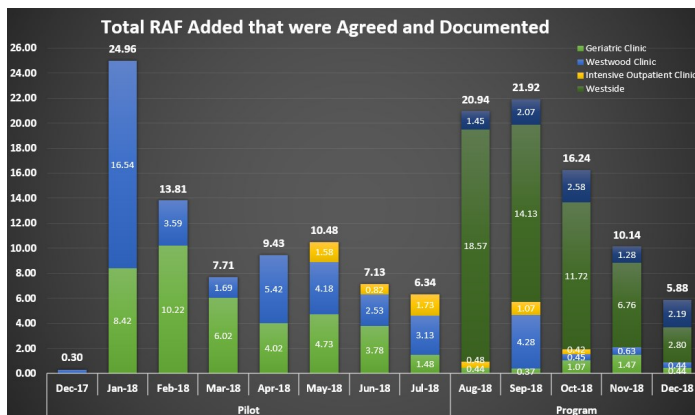
Figure 7.3-2: Impact of CDI Team on Average Risk Adjustment Factor (RAF)
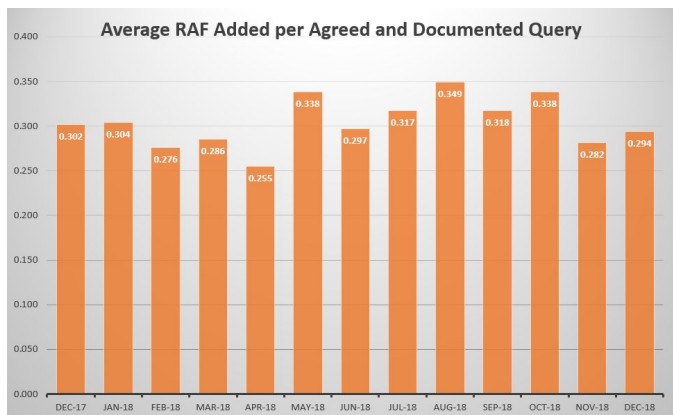
7.4. Workqueues

CDI General Reviews—WQ 008

This workqueue (WQ) lists all inpatients currently in the hospital. The purpose of the WQ is to track the concurrent reviews and queries completed by a Clinical Documentation Improvement Specialist (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. Using the 3M software, CDIS enter in their choice for principal diagnosis, appropriate secondary diagnoses, and procedures performed to get a final "working DRG" with associated SOI and ROM. The reviews, queries and "working DRG" are visible to the coders. During 2018, CDIS worked with the coding department to establish a workflow for coders to review the CDI working DRG prior to completing the final coding. If there was a mismatch that was not easily explained, it was routed to the coding educator via WQ 1614 to review prior to final bill. If a case was completed by the coder that was a mismatch, and the CDIS did not agree with the final coding, CDIS's were able to send the case to WQ 1614 for the coding educator to review.

In 2018, the CDI team reviewed 3,030 records and generated 1,480 queries to providers. Out of the 1,480 queries sent, 944 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 Rate 2018
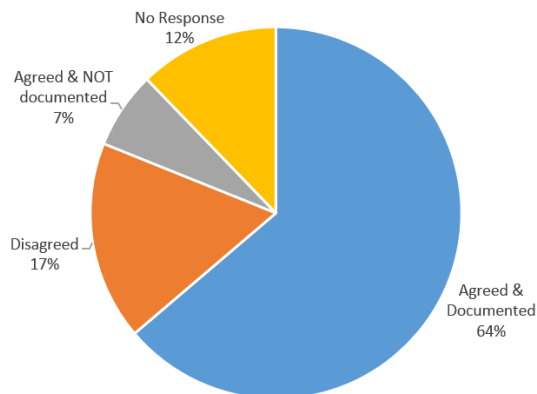
DHHA CDI Coding Review—WQ 1614

This workqueue was created in collaboration with the coding department. After coders review a case that CDI sent for further review, coding staff send 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 their coding auditor.

CDI Patient Accounts No Longer Open with Active CDI Review—WQ 0050

Once a patient is discharged from an inpatient stay and also had a CDI review done in WQ 008, the case will populate to WQ 0050. Once in this list, CDIS will follow up through discharge to compare the CDI concurrent DRG with the coders' DRG. If there are coding errors or issues, CDI staff route the account to the coding auditor via the CDI/Coding Review WQ 1614 as part of this new established means of communication.

8. CULTURE OF PATIENT SAFETY

8.1. Safety Intelligence (SI) Reporting

Safety Intelligence (SI) is DHHA's incident reporting system. All employees can access the system through the intranet and may anonymously report on safety issues. Comparing 2017 to 2018, there was a 9% decrease in incident reporting (Figure 8.1-1). The decrease may be related to more focused reporting on adverse events in the electronic medical record (EMR). With the implementation of Epic, objective data on adverse events can be obtained from the EMR instead of solely relying on subjective information entered into the SI system. DHHA staff understand that Epic is the legal medical record and documentation about patient care must be entered into this system. In addition, adverse events caused by commission or omission or opportunities for improvement should be entered into the SI system for investigation and analysis.

Behavioral events were the most common event type reported in 2018. These events occurred throughout the organization, including inpatient, ambulatory, emergency, and behavioral health locations. A rise in violent patients is being witnessed throughout Colorado hospitals. In order to protect our employees and keep patients safe, DHHA convened a team, Behavioral Health Emergency Response Team (BERT), to act as a fast acting, preventative team which can come to the unit to speak with an individual before his or her behavior escalates. We anticipate this evaluation and potential implementation of BERT to occur in 2019. A Workplace Violence committee also meets on a monthly basis to review reported behavioral events and implement action plans and process improvement initiatives to help keep our employees safe.

Medication related events were the second most reported event type in 2018 (Figure 8.1-2). Medication related reports are reviewed and discussed in several committees and also undergo an in-depth review by the pharmacy Medication, Safety and Quality Manager.

8.1-1: Safety Intelligence Reported Events by Year
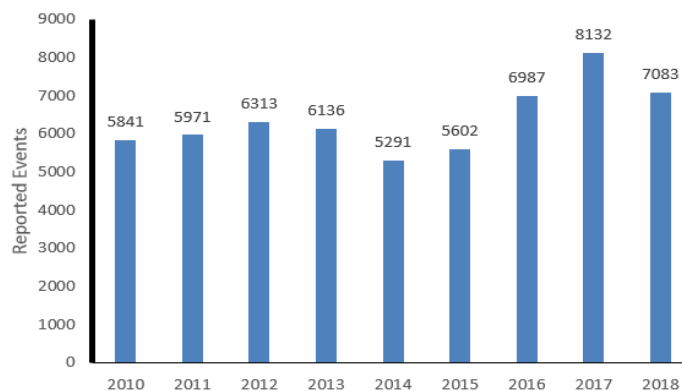
8.1-2: Top 10 Event Types Reported in Safety Intelligence in 2018
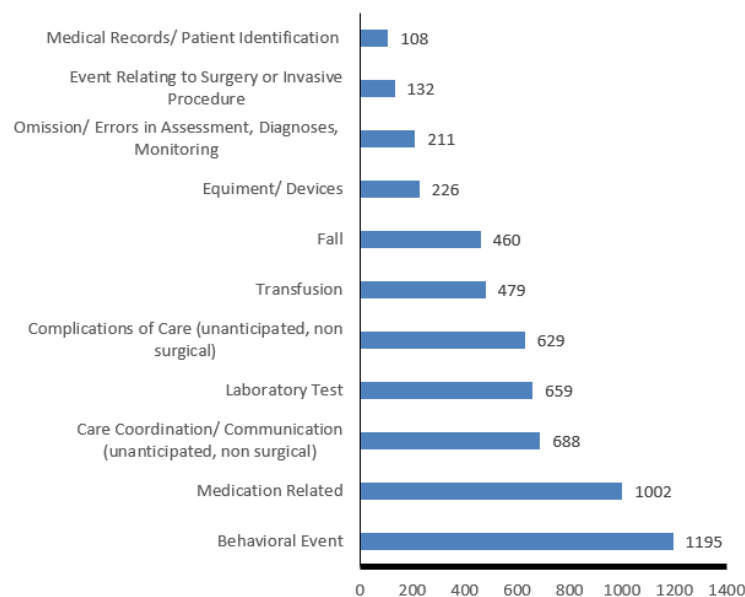
8.2. Monthly Culture of Safety Survey

In late 2017 DHHA conducted a full Culture of Safety Survey distributed to all DHHA employees. From that survey, the Department of Patient Safety and Quality identified 4 measures of culture that showed performance below national means or represented opportunities for alignment with the 2018 enterprise strategic plan. Those 4 questions were selected for monthly pulse surveys of a random sample of employees every month. The monthly data are shown in figure 8.2. Three of the 4 measures showed improvement throughout the year and 2/4 exceeded the predetermined target of a 3% increase in those responding with an Agree or Strongly Agree. Since responses to these questions reflect impressions across a wide variety of activities at DH, many of our initiatives during 2018 can be associated with these outcomes including Target Zero, local leadership team structure and dashboards, antibiotic and opioid stewardship, unit Gemba walks with leadership, a focus on daily performance measures, many Epic enhancements, and improved transparency of quality and safety performance measures.

8.2: Culture of Safety Monthly Survey

2018 Culture of Safety Survey
% Reporting Strongly Agree or Agree
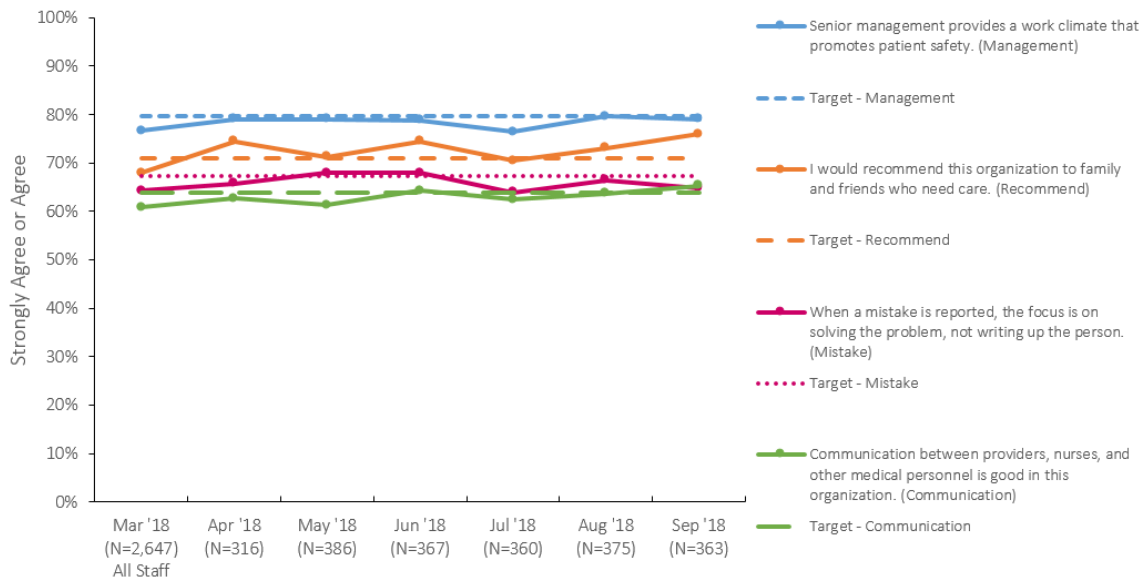
Confidential Privileged Quality Management Document, per C.R.S § 25-3-109 Do Not Copy

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 and 2018. The tool is also referenced periodically during the daily patient safety briefing.

Figure 8.3-1: DHHA Culture of Safety Decision Tree

Source: DHHA DPSQ

Figure 8.3-2: DHHA Culture of Safety Decision Tree

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: Denver Health'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
DH 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 MyRounding, 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. DH 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.

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. 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 DH 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. Through the deployment of these systematic processes, DH experienced a 41 percent decrease in the number of documented grievances in 2017. 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

DH 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 DH 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. DH units prioritize, track trends, and implement change through data, patient feedback and comments, and survey reports. Over the past five years DH has tracked the Overall Rating metrics at an institutional level. (Figures 9.7-1 - 9.7-3).

DH 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 DH 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, DH 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, DH 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.

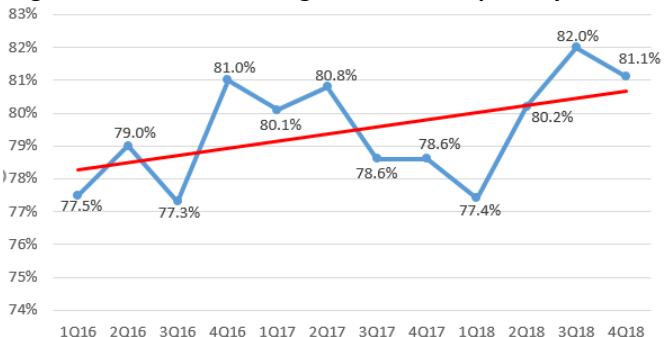**Figure 9.7-1: Overall Rating of Hospital**
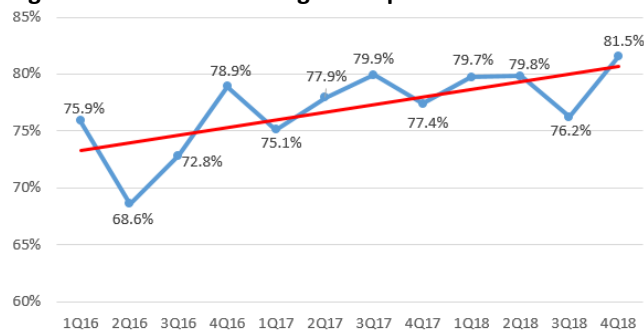
Source: Press Ganey

Figure 9.7-2: Overall Rating of Provider—Primary Care
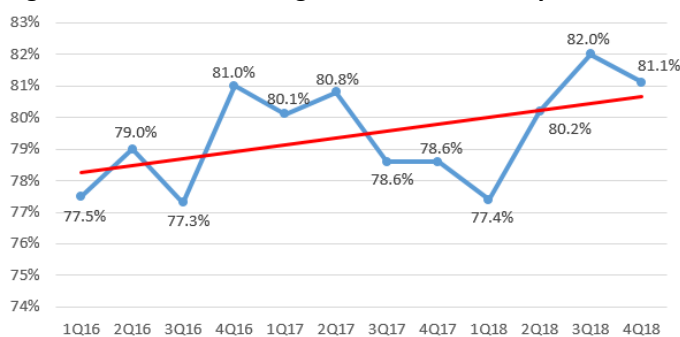
Source: Press Ganey

Figure 9.7-3: Overall Rating of Provider—Specialty Care

Source: Press Ganey

# 10. INFECTION PREVENTION

10.1. Hand Hygiene Adherence

Manual hand hygiene observations:
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 observations are collected by Infection Prevention (IP) staff, inpatient managers, and hospital leadership. Each unit's leadership is 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 2018 was 85%.

Electronic hand hygiene observations:
From April 2016 until June 2018, a pilot electronic HH (eHH) system was installed in the B pavilion (units 3B, 4B, PCU, and MICU). Data regarding individual eHH performance were provided to nurses, healthcare partners, physicians and advanced practice providers until mid-2018. The pilot phase ended in July 2017. Due to infrastructure deterioration beginning in early 2018 and lack of funding to troubleshoot, repair and replace hardware, the pilot was discontinued in June 2018. 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.

Figure 10.1-1: Hand Hygiene Rates by Electronic Observation in Pavilion B
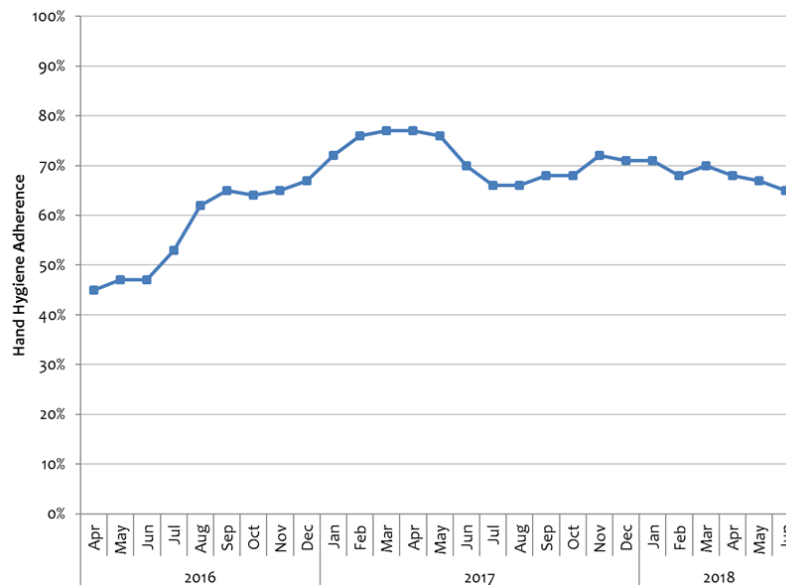
During 2018, data from the eHH system from 2016 to 2017 was used to study the frequency of soap and water vs waterless hand sanitizer after caring for patients with active *Clostridioides difficile* infection (CDI). Over 1 million opportunities for hand hygiene after patient care were collected, of which 16,404 opportunities were linked to patients with active CDI. eHH adherence using either soap and water or waterless hand sanitizer was higher after CDI patient contact (78%) than any patient contact (73%); however, adherence using soap & water averaged 29% during the study period and no improvement was noted over time.

Besides absolute improvements in hand hygiene adherence, DH had a number of other accomplishments in 2018 including:

1. Completed a dispenser change throughout the institution. This allows for the capability of electronic hand hygiene monitoring on more units in the future.

2. Obtained ongoing funding for electronic HH as well as for expanding electronic HH to new areas. Electronic HH had been both successful in terms of improving HH rates as well as decreasing rates of hospital-onset *C. difficile* rates in pavilion B. However, we lacked funding to maintain this system. Toward the end of 2018, our administration approved funding to both stabilize electronic HH in pavilion B and expand it to two units in pavilion A (8A and SICU). Installation of new sensors in these units is scheduled for Q1 2019. Dissemination of individual-level electronic HH data to frontline healthcare workers will continue.

Outpatient hand hygiene surveillance:

As most of the IP staff is based at the main hospital, IP staff is limited in their ability to perform a meaningful number of HH observations at the outpatient clinics. As a result, trained HH champions recruited from regular staff members at the various clinics were relied upon to report HH rates. Each HH champion was trained in the WHO 5 Moments of Hand Hygiene and provided access to the smart phone applications to report observations. Part of the observation required asking 5 health care providers if they performed HH and asking 5 patients after their visit if HH was performed.   Despite the intensive training, the HH observations received from HH champions were suspiciously high. Therefore, a different approach was implemented. In January 2017, Nurse and Medical Assistant students were trained to collect HH observations during their rotations. They were trained to collect 30 observations in a two-week period and submit the data to the ACS Project Coordinator. This approach was unsuccessful as students felt overwhelmed and uncomfortable with the task. In May and June 2018, a pilot program involving HH data collection by members of the Ambulatory Care Services Float Team began. This program was implemented in July 2018 for all ACS clinics. The Float Team obtains HH observations and submits this information manually or electronically once a month. This provides a sampling of HH compliance for the outpatient clinics. Since data collection began, 174 observations have been collected and the overall HH rate has been 79%. As more data are collected, Infection Prevention will begin trending performance over time.

HH observations were also performed at the outpatient behavioral health services (OBHS) clinics. In 2018, a HH Champion Program was established. These observations center on medication administration. Each month, the HH champions collect 40 observations. Overall, the average hand hygiene adherence at the OBHS clinics in 2018 was 78% (Figure 10.1-2).

Figure 10.1-2: Hand Hygiene Adherence in Outpatient Behavioral Health Services Clinics
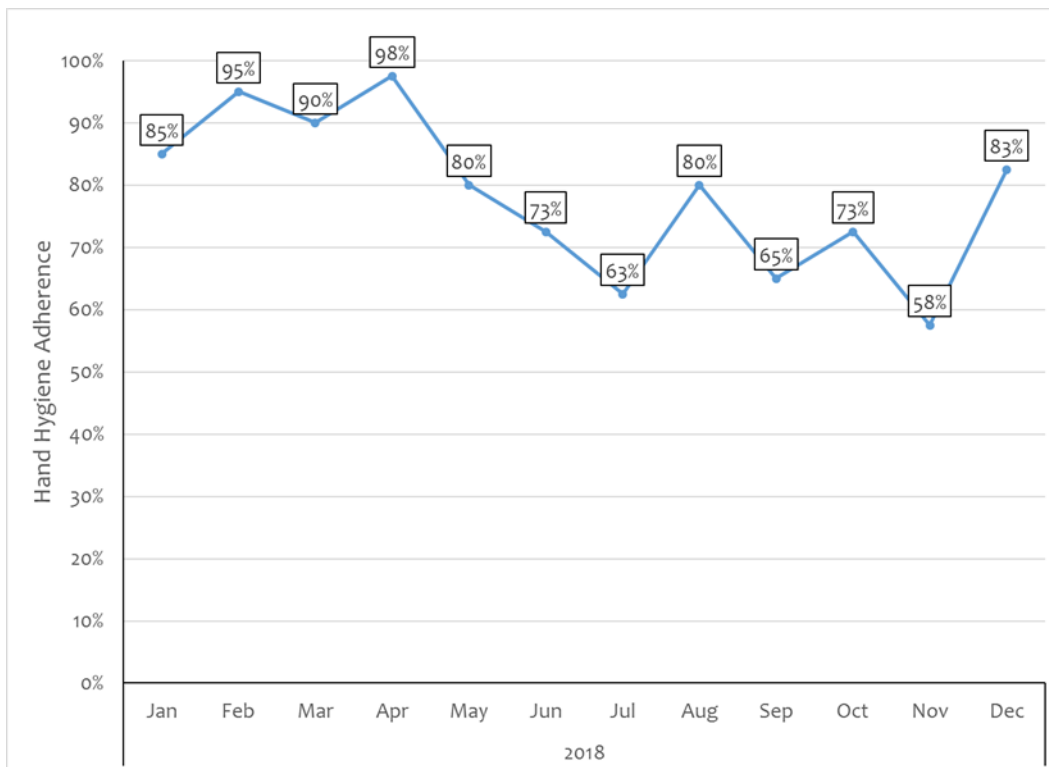
2019 Goals:

The organizational goal for hand hygiene in 2019 will be set at 85%. Performance Improvement efforts will include the following strategies:

1. Continue dispenser change system wide in 2019 to align with electronic HH monitoring capabilities.
2. Introduce electronic HH system to additional units. Evaluate changes to system rules for semi-private rooms.
3. Continue HH champion program monthly data collection, including OBHS.
4. Continue leadership data collection and real time coaching with staff.
5. Continue to provide focused HH education at new employee orientation, new physician orientation, nursing orientation and annual required competency training.
6. Improve quality of outpatient HH observations by employing Float Team members to collect observations.

10.2. Device-Related Infections

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, DH's goal is to decrease the Target Zero event count by at least 10% annually. Between 2016 and 2018, Target Zero events decreased by 35%. Although DH fell just short of the 10% reduction goal in 2018, Target Zero events decreased by 8% in 2018 as compared to 2017. 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 the Target Zero website which is available to all staff members.

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 Safety Network (NHSN). The Standardized Infection Ratio (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.

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: Vizient HIIN Collaborative Process Metrics

Infection	Process Metric	2018 Overall
C. difficile	Percent of *C. difficile* rooms receiving UV light treatment	
	Inpatient	93.2%
	ED	93.0%
CLABSI	Compliance with central line maintenance bundle	44%
CAUTI	Median (IQR) time from Foley placement to removal	20.4 hrs (8-46 hours)
VAP	Percent of ventilator days with spontaneous breathing trial	
	SICU	83%
	MICU	83%
SSI	Adherence to perioperative colon bundle elements	
	Wound protector	50%
	Separate closing tray	69%
	Change gloves prior to closing	69%
	Dressing/suture closure table	71%
	Date/time of wound dressing	69%

Below are listed specific interventions to decrease device-related infections that were undertaken in 2018.

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 are shown in Figure 10.2-2.

Figure 10.2-2: CLABSI per 1000 central line days

	2014	2015	2016	2017	2018	2018 SIR
MICU	0.6	1.4	1.4	1.1	1.8	1.6
SICU	1.9	4.5	3.1	2.7	2.2	1.4
PCU	0.9	4.9	0.0	0.0	0.0	0.0
PICU	0.0	0.0	0.0	0.0	0.0	0.0
NICU	1.8	5.6	3.4	0.0	1.2	0.9
Med/Surg	1.0	1.0	0.9	0.6	0.5	0.5

A Vascular Access-Infusion Therapy Council (VAIC) was formed in 2018 with a "shared governance" structure. More than 20 members from a variety of departments and roles oversee the dissemination of new processes and procedures, products and practices throughout the hospital. In 2018, VAIC created two new policies on IV catheters (central lines, and peripheral and midline), educated staff members on the policy, and led the implementation of a new IV medication pump. Additionally, the VAIC evaluated new products to help reduce CLABSI and other IV-related infections.

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 were 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 2018 Denver Health goal. For all units, DH's central line utilization was significantly lower than NHSN benchmarks in 2018 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 Figure 10.2-3. Daily assessment of catheter need is done by the care team and documented in Epic.

Figure 10.2-3: Central Venous Catheter Utilization Ratio[*]

	2014	2015	2016	2017	2018	2018 SUR
MICU	53%	43%	49%	31%	35%	0.65[†]
SICU	37%	39%	31%	29%	25%	0.47[†]
PCU	29%	34%	20%	18%	13%	0.70[†]
PICU	14%	12%	9%	10%	9%	0.24[†]
NICU	22%	28%	19%	14%	16%	0.84[†]
Med/Surg	11%	11%	11%	9%	11%	0.45[†]

[*] device days / patient days
[†] significantly different compared to 2015 NHSN benchmark data

In 2018, DHHA expanded surveillance of bloodstream infections beyond central line-associated infections. All cases of hospital onset *S. aureus* bacteremia were evaluated to determine if they were secondary to a peripheral IV catheter, midline, or other condition. As a result of this work, we determined 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.

Ventilator Associated Pneumonia (VAP):
VAP rates in the MICU, SICU, and PCU have historically been monitored and benchmarked against national mean rates for comparable units using NHSN. In the MICU and SICU, VAP rates have remained low overall from 2014-2018, decreasing in 2014 and 2015

with some increase from 2016-2018. The PCU did not have any NHSN-defined VAP from 2015-2018.

In 2018, NHSN implemented standardized infection ratios (SIR) for Ventilator Associated Events (VAE), wherein each case is risk-adjusted based on 2015 data using the following indicators: unit location type, facility type, affiliation with an accredited medical school, and number of hospital beds. The NHSN SIR for VAE was investigated as a benchmarking tool in 2018, but since Probable Ventilator Associated Pneumonia (PVAP) events cannot be risk adjusted separately from Infection Related Ventilator Associated Condition (IVAC) events, NHSN's benchmarking is sub-optimally aligned with our institutional surveillance schema. We continue to evaluate using Trauma Quality Improvement Program (TQIP) benchmarking. 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: Ventilator Associated Pneumonia per 1000 ventilator days

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

Interventions are championed by IP, Patient Safety and Quality, unit managers and educators, 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

Figure 10.2-5: Ventilator Utilization Ratio[*]

	2014	2015	2016	2017	2018	2018 SUR
MICU	45%	56%	34%	26%	29%	0.68[†]
SICU	61%	61%	49%	43%	41%	0.89[†]
PCU	10%	9%	9%	3%	2%	0.25[†]

[*] device / patient days
[†] significantly different compared to 2015 NHSN benchmark data.

In 2017, Infection Prevention set up a data warehouse report allowing us to assist Respiratory Therapy in tracking daily screenings for spontaneous breathing readiness. 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 2018, this proportion increased from 78% to 83% in SICU, and 80% to 83% in MICU.

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.

In 2015 NHSN made significant changes to the CAUTI definition which decreased the number of CAUTI reported to NHSN. NHSN no longer publishes benchmark pooled means and percentiles, focusing instead on risk-adjustment through the standardized infection ratio (SIR). In 2017, NHSN updated the benchmark data used for risk-adjustment to 2015 data. Overall the new benchmark data has had the effect of decreasing the number of expected infections for both CAUTI and CLABSI. Denver Health CAUTI rates over the last 5 years, and the corresponding National Healthcare Surveillance Network (NHSN) percentile, are shown in Figure 10.2-6.

Figure 10.2-6: CAUTI per 1000 catheter days

	2014	2015	2016	2017	2018	2018 SIR
MICU	2.7	1.2	1.5	0.9	0.0	0.0
SICU	4.4	3.3	2.6	2.5	1.6	0.6
PCU	5.5	4.3	3.5	3.5	2.1	—
PICU	19.0	10.6	0.0	10.3	0.0	—
Rehab	15.6	4.8	7.3	0.0	2.9	—
Med/Surg	3.8	2.5	2.1	1.2	0.5	0.5

In 2018, IP staff updated the CAUTI and CLABSI education modules. All staff that performs central line insertions, intubations, ventilator care, and catheter care were assigned these updated modules.

The nursing staff designated CAUTI reduction as a major goal between 2016 and 2018, and they will continue this in 2019. 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.

In 2018, IP 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. DH's urinary catheter utilization is significantly better than the NHSN benchmark for the MICU, PICU, and Med/Surg units (Figure 10.2-7).

Figure 10.2-7: Urinary Catheter Utilization Ratio[*]

	2014	2015	2016	2017	2018	2018 SIR
MICU	71%	67%	67%	56%	51%	0.86[†]
SICU	77%	75%	67%	59%	57%	0.97
PCU	43%	39%	32%	25%	27%	1.18[†]
PICU	10%	11%	9%	15%	9%	0.53[†]
Rehab	13%	18%	19%	15%	17%	2.13[†]
Med/Surg	11%	9%	7%	7%	9%	0.51[†]

[*] device days / patient days
[†] significantly different compared to 2015 NHSN benchmark data. A ratio < 1 indicates lower utilization, and a ratio > 1 indicates higher utilization.

In 2017 and 2018, IP staff partnered with ICU leadership to conduct a Buddy System trial for urinary catheter insertions. The goal of the trial was to reduce CAUTIs, particularly those occurring within 5 days of insertion. While one RN inserted the catheter, a second RN observed the procedure ensuring that there were no breaks in sterile technique. While the Buddy System was associated with decreases in CAUTI in the ICUs, there were similar decreases in CAUTI on the floors where the intervention was not introduced. Therefore, Denver Health will not emphasize the Buddy System for CAUTI prevention in 2019. Instead, the focus will be on the following:

1. Urine testing only when clinical symptoms or signs of UTI are present;
2. Prompt removal of the urinary catheter when it is no longer indicated;
3. Appropriate Foley catheter maintenance procedures;
4. Changing the Foley catheter prior to obtaining a urine sample; and
5. Continuing to use urinalysis to determine which urine samples are appropriate for culture.

TQIP – In 2018, IP staff partnered with the TQIP coordinator to validate alignment of surgical site and device related infection data; turnover in staff led to limited ability to collaborate. In 2019, IP and TQIP staff have partnered to develop standard work for aligning surgical site and device related infection data and are developing a regular meeting cadence.

Goals for 2019:

Central venous catheters, endotracheal tubes, and urinary catheters pose increased risk for HAI. The following interventions will be continued or implemented to decrease risk for infection from these devices in 2019:

1. Provide immediate feedback on CAUTI and CLABSI to unit nursing leadership, residents, and attending physicians.
2. Promote awareness of Target Zero initiative.
3. Participation in the HIIN collaborative with submission of monthly data on process measures to decrease CLABSI, CAUTI, SSI, and VAP.
4. Quarterly collaboration with TQIP coordinator to ensure that our data are adequately aligned.

CAUTI:
5. Urine testing only when clinical symptoms or signs of UTI are present.
6. Prompt removal of the urinary catheter when it is no longer indicated.
7. Appropriate Foley catheter maintenance procedures.
8. Change the Foley catheter prior to obtaining a urine sample.
9. Continue to use urinalysis to determine which urine samples are appropriate for culture.

CLABSI:
10. Continue frequent rounding on central lines, particularly those used for TPN.
11. Support the Vascular Access Committee in evidence-based evaluations of new products.

OTHER:
1. Begin surveillance for bloodstream infections associated with midline catheters.
2. Continue surveillance for bloodstream infections associated with peripheral IV catheters.

10.3. Surgical Site Infection (SSI) Rates

DH performs SSI surveillance for 17 procedures including 2 nationally-reported procedures, 7 state-reported procedures, and 11 additional procedures deemed high impact to our patient population. As a result, surveillance for SSI began for ambulatory transrectal 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 in Figure 10.3-1.

Figure 10.3-1: Surgical Site Infections per 100 Operations

	2014	2015	2016	2017	2018	2018 SIR
Knee Arthroplasty	0.6	0.0	0.6	1.0	1.4	2.0
Hip Arthroplasty	2.0	5.3	2.8	3.3	0.8	0.5
Abdominal Hysterectomies	4.8	3.9	1.2	4.8	1.2	0.5
Vaginal Hysterectomies	2.9	0.0	3.0	1.2	0.0	-
Craniotomies	2.5	0.9	3.9	4.1	2.3	1.7†
Spinal Fusions	1.4	1.2	1.3	0.6	3.5	3.2
C-sections	0.9	0.0	1.7	2.0	0.7	0.7
Herniorrhaphy	1.8	1.6	1.6	1.9	0.2	0.5
Colon Surgeries	9.8	11.0	11.0	6.2	3.4	0.5
Breast Surgeries	0.8	1.7	2.2	1.0	1.4	0.9
Prostate and Nephrectomy Surgeries∞	6.8	7.1	1.9	0.0	4.1	-
Open reduction of fracture	2.3	2.2	1.8	1.4	1.8	2.1
Vascular surgery‡	4.8	4.8	2.0	0.8	1.8	-

† significant SIR
∞ 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.

Because DHHA is a vertically integrated system, post-discharge infection surveillance is more comprehensive than most hospitals. The ability to do thorough surveillance may make rates appear higher than other hospitals reporting to NHSN. Overall, DH has seen a dramatic decline in SSIs over the past two years (Figure 10.3-2).

Figure 10.3-2: Surgical Site Infection Standardized Infection Ratio (SIR), 2016-2018

Standardized Infection Ratio (SIR) - Publicly Reported
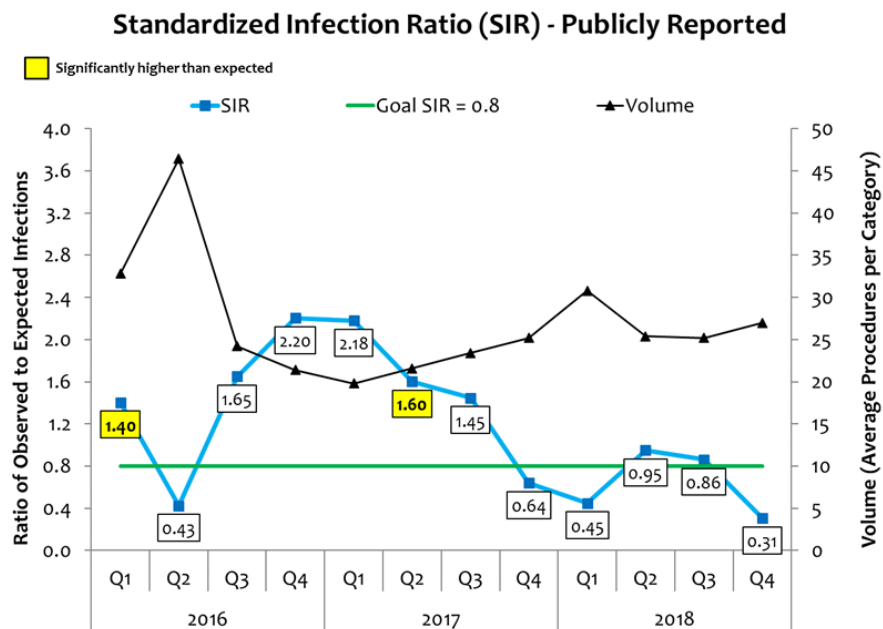
Colon SSI Prevention Bundle

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. Since the introduction of the bundle, colon SSI's have decreased between 2016 and 2018, and it is anticipated that this trend will continue into 2019. In 2016 through 2018, Infection Prevention worked closely with the pre-operative, operative, and post-operative teams to further develop and implement all elements of the colon bundle and to make more of the elements electronically available. In 2019, all of the bundle components should be electronically available for improved efficiency.

Figure 10.3-3: Colon Surgery Infection Rate, 2013-2018
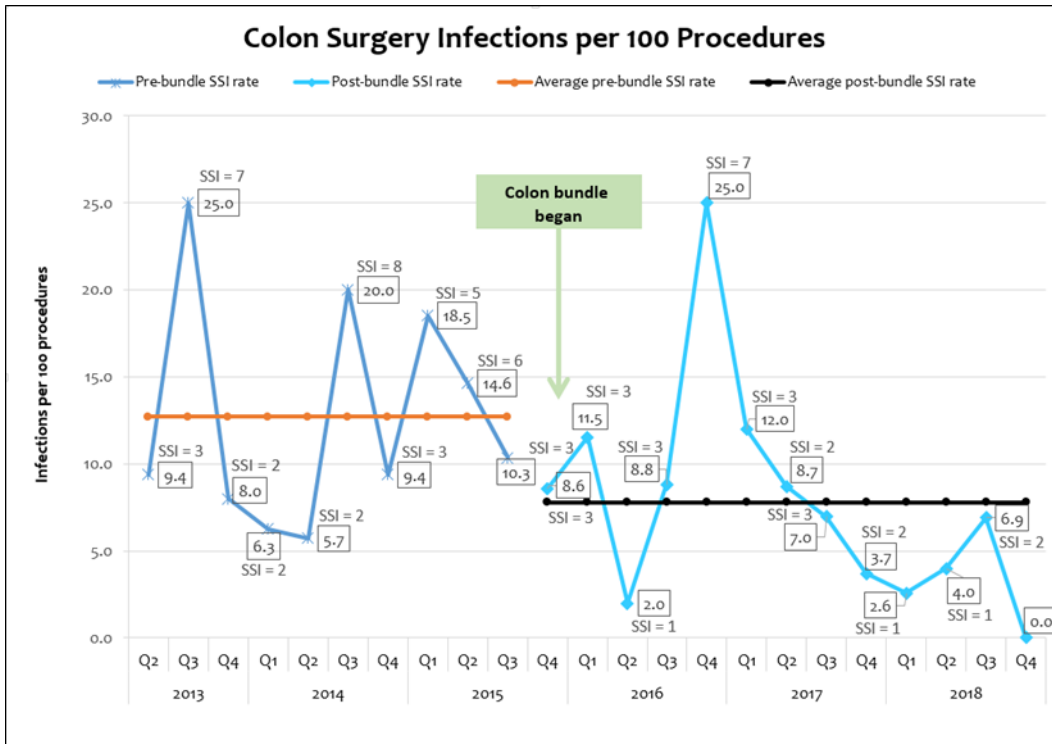
Figure 10.3-4: Colon Bundle Adherence by Surgeon Indicator
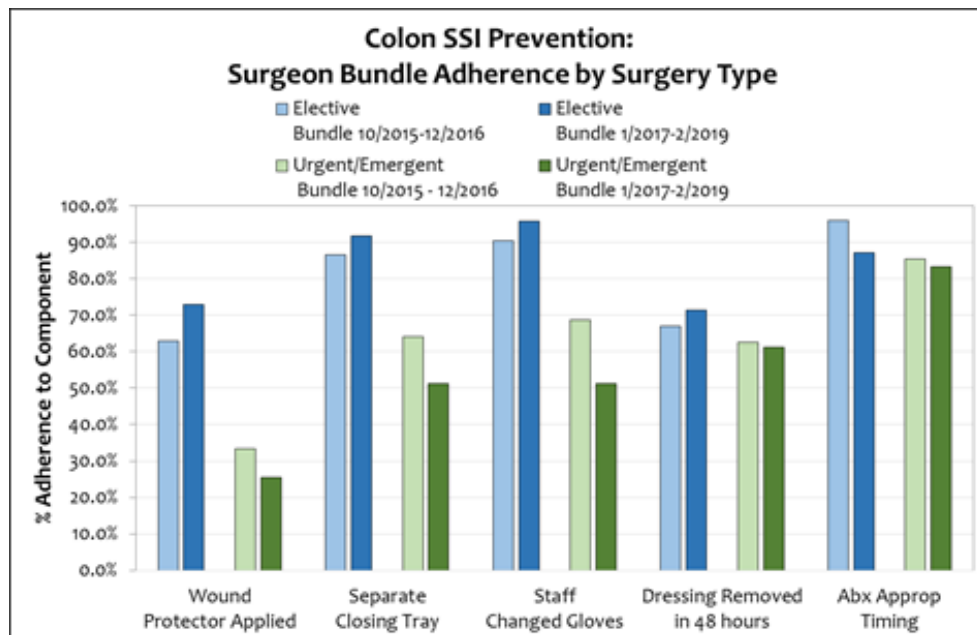
Figure 10.3-5: Colon Bundle Adherence by Nursing Indicator
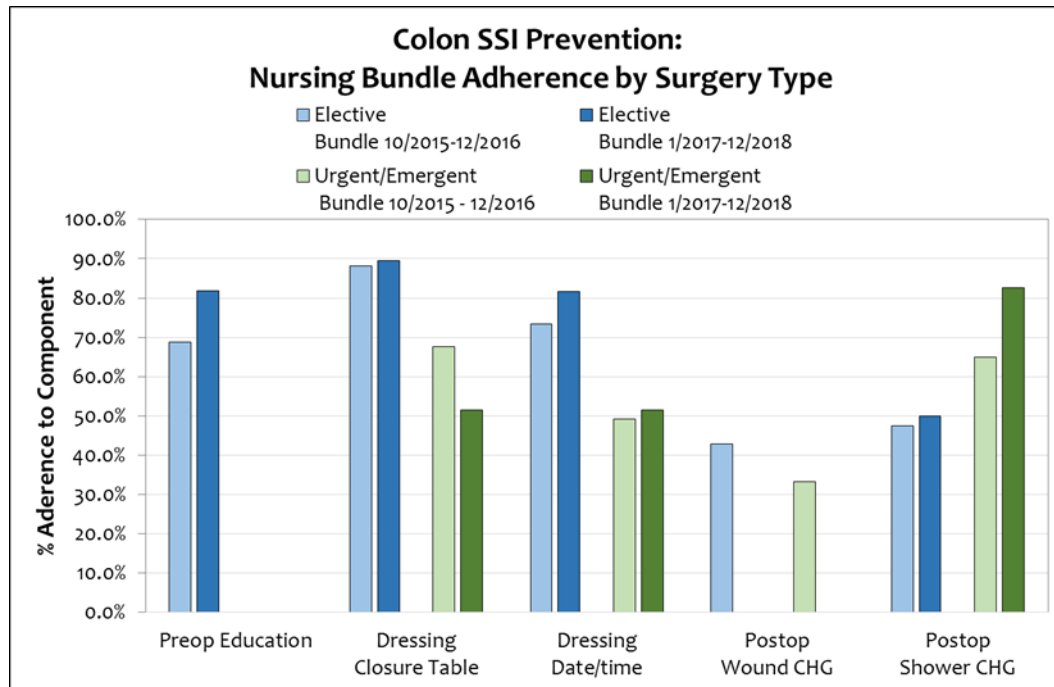
It was noted that certain components of the colon bundle have higher adherence than others. To address this and improve the colon SSI rates even further, the team will be focusing on the lower adherence regions for 2019.

Gynecology SSI Prevention Bundle

In 2018, Infection Prevention implemented an SSI prevention bundle for abdominal hysterectomy and Cesarean section surgeries in conjunction with a gynecologist. Components of this bundle included preoperative chlorhexidine shower, Chloraprep antiseptic skin preparation, chlorhexidine vaginal preparation, appropriate antibiotic selection and timing, change of gloves after fascial closure, normal saline wound irrigation, subcutaneous tissue reapproximation with monofilament suture and subcuticular closure with monofilament suture. The inclusion of these factors was based on peer-reviewed literature. Adherence to the bundle is tracked electronically by the gynecology team and reviewed by IP. Initial review indicates SSI bundle compliance of > 95% with most measures. However, compliance with preoperative shower was as low as 5% in the initial implementation months and about 50% after 12 months.

Surgical site infection cluster

In 2018, there was an increase in SSI after spinal surgeries (fusion and laminectomy) with 7 infections in a 6-month period. Infection Prevention staff performed a case-control study to formally determine risk factors. Perioperative antibiotics, preoperative skin preparation, surgical history, and tobacco use were significant risk factors. Specifically, higher risk included :
- Use of cefazolin alone (as compared to cefazolin plus vancomycin) for perioperative prophylaxis
- Chloraprep skin antisepsis (as compared to Chloraprep plus chlorhexidine soap)
- Previous spinal surgery
- Use of tobacco products prior to surgery

Therefore, process changes were implemented, such as the use of cefazolin plus vancomycin for fusion procedures, a double skin prep with chlorhexidine soap followed by Chloraprep, and limiting elective surgeries to non-smokers.

Perioperative skin preparation

The quality of perioperative skin preparation has been under evaluation since 2017. 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. A post-education evaluation of skin preparation revealed significant improvements (Figure 10.3 -6).

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

Variable	Baseline N = 72	Intervention N = 52	P-value
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)	0.02
Cleansing motion from incision to periphery, n (%)	56 (78)	50 (96)	0.004

Perioperative antibiotic selection

In 2017, perioperative antibiotic selection was audited and inconsistent prescribing practices were identified. The AS team updated the surgical prophylaxis policy in 2018.

Surgeon-specific reports

The IP Department generates a surgeon-specific report for Ongoing Provider Performance Evaluations (OPPE) biannually. This report fulfills a Joint Commission requirement as well as provides important feedback to surgeons about their infection data.

In 2018, other procedure-specific interventions were performed including:
- Notified OR leadership of SSIs 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 2018 Achievements).

Sterile Process Management implementation

In 2018, Ambulatory Care Services began implementing the existing hospital Sterile Process Management (SPM) scanning technology in order to reduce lost instruments, help recognize instruments that needed to be repaired or replaced, and to eliminate their manual process. The electronic process will also improve the identification of specific instruments used with each patient. Clinic instrumentation was identified with correct nomenclature and staff were trained to include computer use on inventory, location and status of instruments at any given time. A binder was created for each clinic which shows photos of the instruments specific to the clinic. Included with the photo is a corresponding bar code allowing staff to easily scan the appropriate instrument. Currently, Webb Dental is piloting the process.

2019 Goals:

The following surgeries will be targeted for SSI surveillance:
- Prosthetic knee and hip replacements
- Abdominal and vaginal hysterectomies
- Craniotomies
- Spinal fusions
- Herniorrhaphies
- Colon resections
- Breast surgeries
- Prostate surgeries
- Open reductions and fixations
- Vascular surgeries
- Nephrectomies
- Cesarean sections
- Gender confirmation surgeries
- Ambulatory transrectal prostate biopsies

1. Continue to report SSI rates after arthroplasty, abdominal hysterectomies, breast surgeries and colon surgeries to the state of Colorado.

2. Continue to provide SSI reports to individual surgeons to submit for their Ongoing Provider Performance Evaluations (OPPE). This will fulfill a Joint Commission requirement as well as provide important feedback to surgeons about their infection data.

3. Continue to send real time notification of SSI to the OR team members, residents, and attending surgeons. These will also be shared in aggregate with OR leadership.

4. Work with the preoperative, operative, and postoperative teams to implement all elements of the colon bundle and to collect all data electronically.

5. Work with the preoperative, operative, and postoperative teams to implement all elements of the OB/GYN bundle to prevent SSI.

6. Complete SPM roll-out to outpatient clinics.

7. Continue to audit the quality of perioperative skin preparation with Chloraprep, Hibiclens, and povidone-iodine preparations.

8. Monitor perioperative antibiotic adherence to guidelines.

9. Participate in the HIIN collaborative with submission of monthly data on process measures to decrease SSI.

10. Greater collaboration with TQIP coordinator to ensure that data are adequately aligned.

10.4. Multi-Drug Resistant Organisms (MDRO)

Denver Health's goal is to minimize hospital-associated spread of MDROs and other organisms identified as significant. Daily surveillance of MDROs and organisms of significance 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* (VRSA/VISA)
- Vancomycin-resistant enterococci (VRE)
- *Clostridioides difficile*
- Influenza virus

Figure 10.4-1: Rates of Multi-Drug Resistant Organisms in Hospitalized Patients, 2014—2018$^\$$

	2014	2015	2016	2017	2018
Acinetobacter baumannii	0.07	0.10	0.06	0.13	0.09
Aspergillus	0.03	0.02	0.02	0.08	0.05
Hospital-acquired *Clostridioides difficile*	0.54	0.85	0.75	0.54	0.60
Extended spectrum beta lactamases (ESBLs)	0.08	0.11	0.37	0.11	0.28
Hospital-acquired Methicillin-resistant *Staphylococcus aureus* (MRSA)	0.27	0.26	0.28	0.23	0.37
Carbapenem-resistant *Pseudomonas aeruginosa*	0.06	0.04	0.10	0.10	0.12
Vancomycin-resistant enterococci (VRE)	0.25	0.15	0.13	0.16	0.21
Carbapenem-resistant *Enterobacteriaceae* (CRE)	0.00	0.01	0.03	0.00	0.00
Influenza*	14.0	10.2	12.2	20.0	24.1

$^\$$ 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 DH. All isolates reported from clinical lab are recorded to alert Infection Prevention of potential breeches in construction early, as increase in isolation rates could be indicative of such a breech. All positive cultures for *Aspergillus* are reviewed 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 the SICU and OR, such as limited pulsatile lavage on colonized patients, empiric isolation, and decreased fluoroquinolone usage. While the resistant version of *A. baumannii*, prevalent in previous years and at many trauma centers, had been essentially eliminated from DHHA, d a resurgence of multidrug resistant *A. baumannii* occurred in 2018. Two outpatients, both with spinal cord pathology, neurogenic bladders, and deep pressure ulcers were found to have carbapenemase-producing *A. baumannii* in their urine at the time of admission. In both cases, this was determined to represent asymptomatic bacteriuria. Infection Prevention worked with the Colorado Department of Public Health and Environment to determine epidemiologic similarities and microbiologic characteristics. The two isolates were genetically identical. It was determined that the patients had overlapped in the hospital for one week in 2017 and had a common wound care provider. Infection Prevention staff observed practices and noted lapses in both hand hygiene and in cleaning shared patient equipment. Education was provided to the involved providers to improve practices going forwards.

Methicillin-resistant *Staphylococcus aureus* (MRSA) - Active surveillance screening was discontinued in both the MICU and SICU during 2014 as universal decolonization and CHG bed bathing was implemented as the standard of care in 2015. Patients with MRSA or VISA/VRSA are flagged appropriately in the electronic medical record. 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 by NHSN (Figure 10.4-2).

Particular attention to MRSA was placed in the OBHS clinic in 2018. The team provides basic wound care kits with instructions to provide patients with supplies to care for minor wounds outside of the clinic. A new attending trained in both infectious diseases and substance abuse was hired this year to help manage these patients.

Figure 10.4-2: Standardized Infection Ratio for Hospital-acquired MRSA Bacteremia Infections
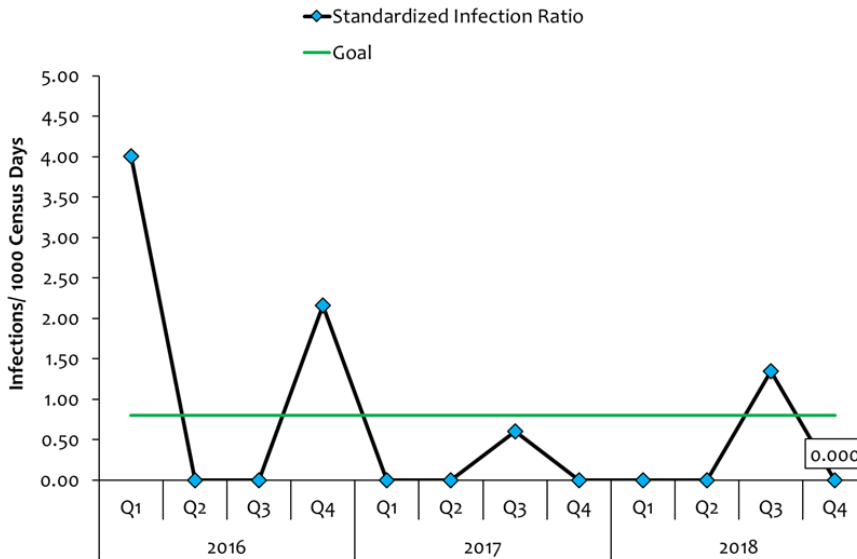

Vancomycin-resistant enterococci (VRE) - Each VRE case was reviewed in detail and any potential clusters evaluated. Monthly VRE rectal screens were conducted in the SICU and MICU. Patients identified as positive are then isolated and a 'VRE' flag is automatically added to their chart in Epic. The antibiotic stewardship program continues to be closely involved in the VRE reviews and discussions.

Figure 10.4-3: Positive Vancomycin-resistant Enterococcus culture rate
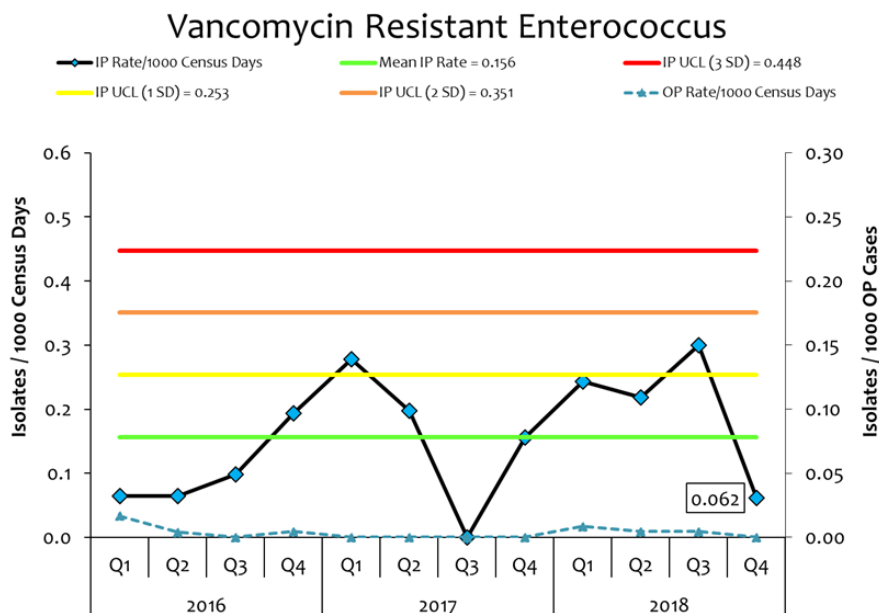
Clostridioides difficile - Previously called *Clostridium difficile.* Rates of community-acquired *C. difficile* have increased steadily over the past few years while hospital-acquired *C. difficile* has remained constant as shown in Figure 10.4-4.

Figure 10.4-4: *Clostridioides difficile* infection rates
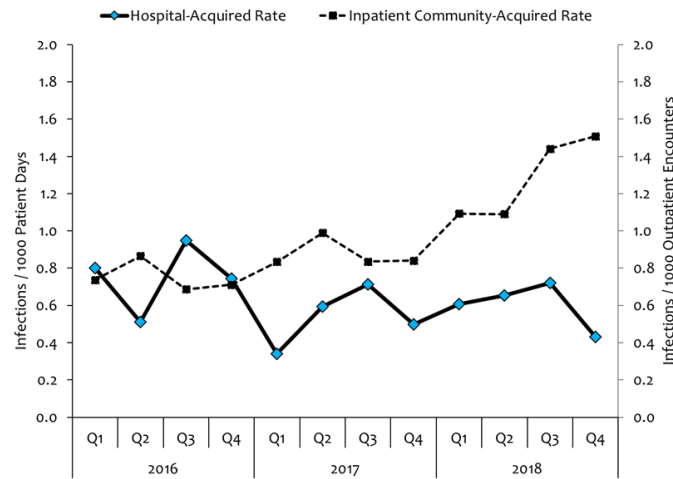
C. difficile was a major institutional focus in 2017 and 2018. Probiotic administration was initiated for inpatients on broad spectrum antibiotics in 2017. DHHA also contracted with OpenBiome to provide fecal transplants to patients with recurrent *C. difficile* colitis. Additionally, Environmental Services (EVS) substituted Perisept (peracetic acid) as the default cleaning product in the hospital. Perisept has activity against *C. difficile* spores and is less caustic to the hospital equipment and staff members. IP assisted EVS with the purchasing of two additional ultraviolet (UV) light devices. In 2018, approximately >95% of inpatient and ED rooms previously occupied by patients with *C. difficile* colitis were treated with UV lights after terminal cleaning at discharge (Figure 10.4-5). ED and urgent care rooms, OR suites, the hemodialysis unit, and the admission-discharge unit are also treated with a UV light weekly.

In 2018, a Masters in Public Health student assessed adherence to personal protective equipment (PPE) amongst healthcare workers who were entering and exiting the rooms of patients with *C. difficile* infection. Healthcare workers performed hand hygiene approximately 47% of the time when entering a room with a patient who had *C. difficile.* In contrast, hand hygiene after exiting these rooms was almost 100%, though 2/3 used hand sanitizer, which is less effective in removing spores than soap and water. These observations were followed by a survey of staff members to determine the reasons they did not use the more effective soap and water after exiting the room of a patient with *C. difficile.* Sink placement and the availability of soap and paper towels were seen as major barriers. The plan is to address these concerns in 2019.

Figure 10.4-5: Proportion of rooms previously occupied by patients with
***Clostridioides difficile* infection that received UV disinfection treatment**
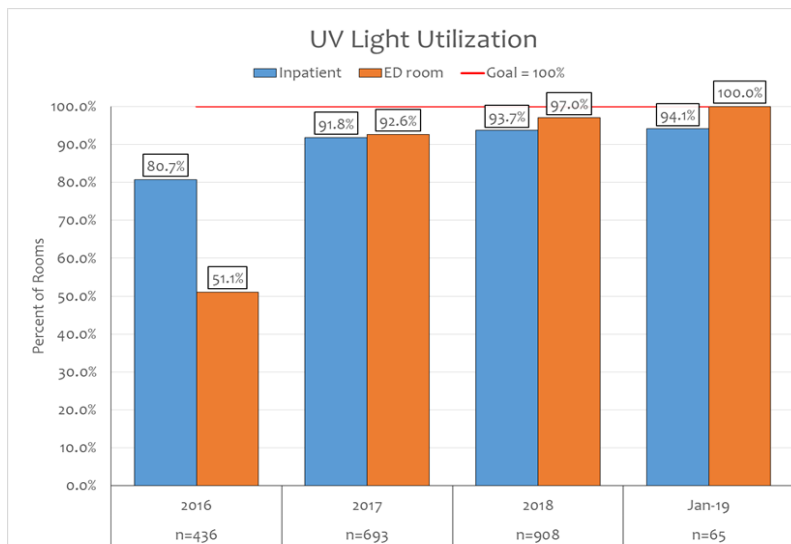
Carbapenem-resistant *Enterobacteriaceae* (CRE) - Also known as *Klebsiella pneumoniae* Carbapenemase (KPC) and Extended-spectrum beta lactamases (ESBLs). In 2013 an outbreak of CRE in a large teaching hospital in Denver prompted increased surveillance at DHHA and monthly surveillance in the critical care units continued in 2018. The increased screening and rapid identification and isolation of these patients have proven to be very effective in controlling cases (Figure 10.4-6). Rates of multi-drug resistant gram-negative organisms, such as extended-spectrum beta-lactamase (ESBL)-producing *E. coli,* continue to increase in Denver Health's outpatient population which is consistent with national trends. Rates of imipenem-resistant *P. aeruginosa* infections have progressively declined at DH over time and remain low. Aggressive surveillance, isolation, and antibiotic stewardship have kept these organisms from becoming endemic at DH.

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

Infection Prevention maintains a close relationship with the microbiology lab. IP staff attend microbiology rounds each week during which any concerning infection patterns, incoming microbiology testing platforms, and interesting clinical cases are discussed.

There was a substantial amount of construction in 2018 including breaking ground for the new Outpatient Medical Clinic. The Infection Prevention 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. 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. The project superintendent or their designees are held responsible for seeing that all workers are in-serviced in appropriate infection prevention techniques prior to the start of their work at Denver Health.

Environment of Care rounds were made by the Infection Prevention staff routinely. Frequency was based on the 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.

Rates of *Aspergillus* isolated in clinical cultures also were reviewed by IPC on a regular basis. There was a slight increase in cases during 4th quarter 2017 (Figure 10.4-7). All cases were reviewed and determined to be community onset cases with no links to hospital admissions or active construction in the facility.

Figure 10.4-6: Culture positive rate for CRE

Carbapenem-Resistant Enterobacteriaceae (CRE) Organisms
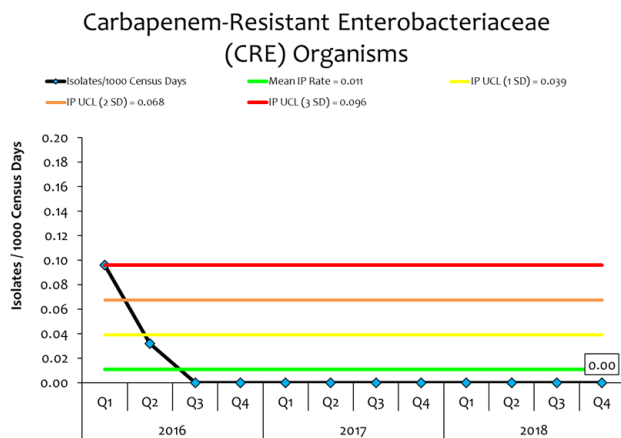
Figure 10.4-7: Culture positive rate for Aspergillus
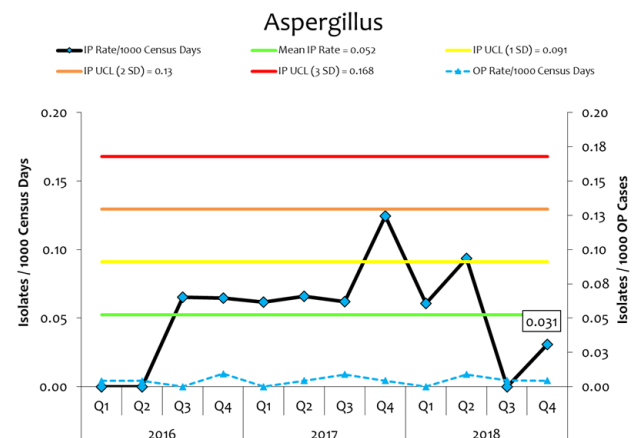
Aspergillus

2019 Goals:

Decrease healthcare transmission of multi-drug resistant organisms (MDRO)/ensure containment of organisms of significance.

Daily surveillance of the following MDROs/organisms of significance will continue in 2019:
- *Aspergillus*
- *Acinetobacter baumannii,* both multidrug resistant and drug susceptible.
- Multi-drug resistant *Pseudomonas aeruginosa*
- Carbapenemase-producing *Enterobacteriaceae* (CRE)
- Extended spectrum beta lactamases (ESBL)
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant *Staphylococcus aureus* (VRSA/VISA)
- Vancomycin-resistant enterococci (VRE)
- *Clostridioides difficile*
- Influenza virus
- Hospital-onset Legionella cases

1. Continue to review microbiology reports and communicate with the microbiology laboratory to identify clusters of infection so further spread is prevented.

2. Decrease healthcare associated cases of *C. difficile* by
   1. Environmental cleaning quality assurance via Hygiena ATP technology and UV lights.
   2. Antibiotic stewardship progress on probiotic and fecal transplantation therapies.
   3. Improve identification and testing process for community onset *C. difficile*.
   4. Reduce inappropriate testing for hospital onset *C. difficile* through electronic decision support
   5. Improve access to soap/water or other friction methods of cleansing hands when healthcare workers leave a room of a patient with *C. difficile.*

3. Develop a flu syndromic surveillance program within Epic to provide timely surveillance data to inform the status of respiratory illness in the community.

4. Reminders on isolation carts to improve hand hygiene prior to entering an isolation room and after exiting an isolation room.

5. Decrease the risk of HAI related to construction and ensure that design of new or remodeled facilities optimizes infection prevention.
   1. Continue to attend meetings starting with predesign and preconstruction.
   2. Attend weekly meeting for all ongoing construction projects.
   3. Conduct routine walk-throughs on all construction areas.
   4. Perform ICRAs prior to the start of any construction; perform in-service for contractors about the infection prevention concerns related to hospital construction.

10.5. Collaboration with Center for Occupational Safety and Health (COSH)

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. There has been a decline in total employee exposures and bloodborne pathogen exposures over the past decade (Figures 10.5-1 and 10.5-2). Of note, the OBHS clinic has not had an exposure reported for three years (Figure 10.5-3). This success is attributed to the awareness of staff members and the presence of sharps containers and safe syringe disposal containers in all bathrooms.
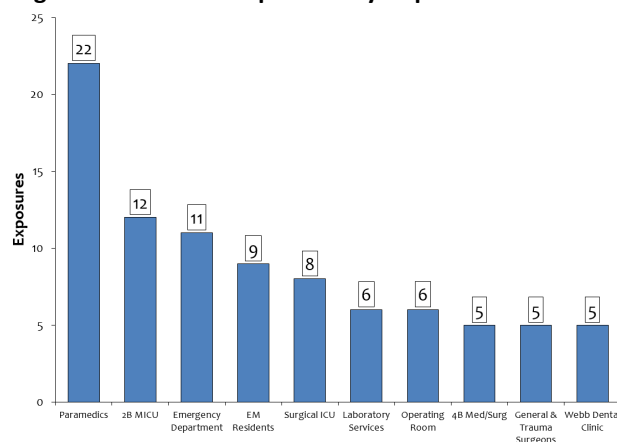
Figure 10.5-1: Total Exposures by Year
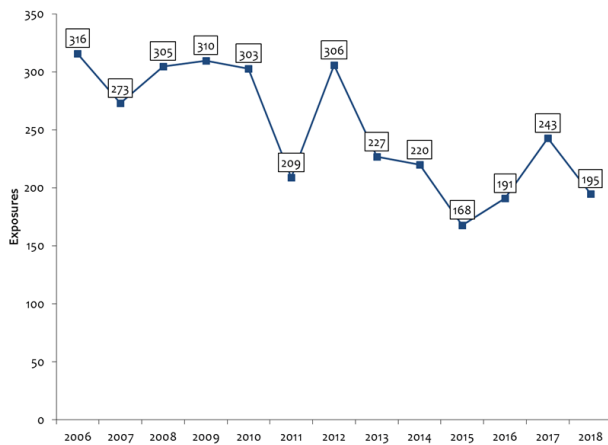
Figure 10.5-2: Bloodborne Pathogen Exposures by Year
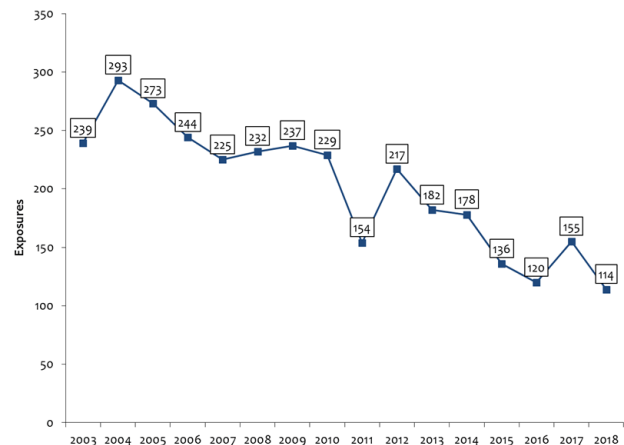
Figure 10.5-3: 2018 Exposures by Department*

* Top 10 departments with ties

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, Infection Prevention and COSH collaborated to streamline the reporting process for BBPE. In 2019, IP will work with staff to ensure adherence to the new processes. "Swarm" events will be implemented when the process is not optimally followed to quickly troubleshoot and improve the process.

Influenza Vaccination

DH has mandated employee influenza vaccination since the 2011-2012 influenza season. The rationale for implementing such a policy reflects the enterprise's 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 healthcare workers (HCWs) contract influenza each season. This leads to staffing shortages, as evidenced by an increase in sick calls at DH correlating with influenza peak activity during the past five 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 DHHA's employee population. Finally, there are data showing:

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

DH has successfully implemented, and continues to refine, an electronic tracking system that allow managers to track real time the status of their employees 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 system 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 have been vaccinated.

Ultimately, DH has vaccinated over 98% of all employees/contractors against seasonal influenza since the implementation of this policy. There is an approximately 2% exemption rate for staff with medical contraindications or religious waivers each year.

Figure 10.5-4: DHHA Influenza Vaccination Rate Among Employees by Influenza Season
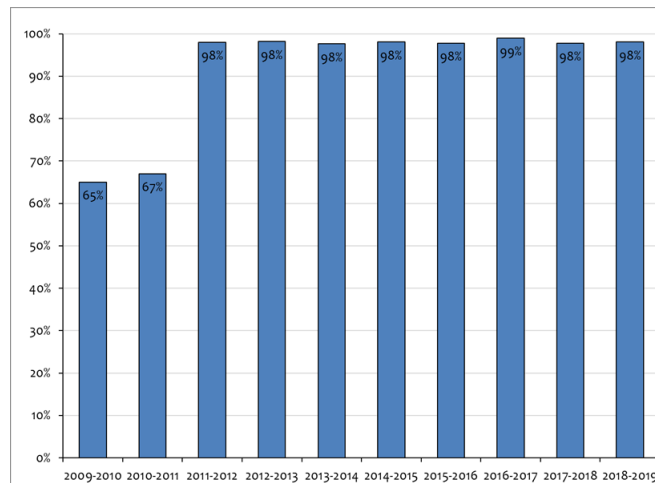
2019 Goals:

Collaboration with Center for Occupational Safety & Health (COSH) to decrease occupational infection related hazards.
Infection Prevention will continue to work closely with COSH in 2019 to decrease occupational infection related hazards through the following processes:

1. Review employee exposure data at Infection Prevention meetings at least semi-annually.

2. Provide education at new employee orientation and annual competency training about reporting of exposures.

3. Implement "swarm" events to become aware of places where the BBPE testing protocol does not work as expected.

4. Collaborate and implement the universal influenza vaccination program.

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:

1. Expanded use of Hygiena surface monitoring. Prior to 2017, IP performed swabs on five high touch surfaces in rooms after cleaning and provided feedback to the cleaning staff on which surfaces were cleaned optimally and sub-optimally. In 2017, this responsibility was transitioned to EVS managers. This data has been presented monthly at IP committee meetings and used for immediate EVS staff feedback on the quality of the cleaning.

2. Expanded use of ultraviolet machines. DHHA purchased two additional ultraviolet machines in 2016 and trained EVS management in their use. They are currently being used after terminal clean of a room in which a patient with *C. difficile* resided. Additionally, the ultraviolet light machines are used weekly in each operating room, emergency department room, adult urgent care room, and in the admission-discharge and hemodialysis units.

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

4. Evaluated cleaning processes in the OR. IP staff closely evaluated all the processes utilized in the OR for case turnovers and terminal cleans. Numerous staff were observed cleaning rooms and their process and product use was evaluated. Numerous surfaces were swabbed for ATP using the Hygiena ATP technology. After a thorough evaluation, it was determined that many areas had opportunities for improvement. As a result of IP's recommendations, the OR hired dedicated EVS staff members who trained in depth on OR cleaning.

5. Improvement to cleanliness and safety at OBHS. In 2018, OBHS installed new safe syringe disposal containers in all bathrooms. The installation has contributed to a reduction in improperly disposed of syringes in the facility and created a safer environment for staff and patients. Additionally, OBHS and EVS worked together to ensure prompt communication and resolution of EVS related issues. Response of EVS personnel was markedly improved during 2018. Lastly, in an effort to promote cleanliness of shared areas, OBHS removed patient recliners within the methadone clinic.

2019 Goals:
Infection Prevention will continue to work closely with the Environmental Services program in 2019. Some of the initiatives shall include:

1. Continued focus on Hygiena swabs to optimize the quality of terminal cleans.
2. Sustain a high rate of ultraviolet lights use in rooms in which a patient with *C. difficile* has resided.
3. Consistently use the ultraviolet light on a weekly basis in the operating rooms, emergency department, adult urgent care, admission-discharge unit, and hemodialysis units.
4. Evaluate the impact of dedicated EVS OR staff on OR cleanliness.
5. Continue to collaborate with EVS and OBHS leadership and staff on education to improve communication, awareness of OBHS needs, and standard cleaning processes.
6. Quarterly status review with EVS and OBHS staff to assess progress and identify opportunities.

10.7. Ebola and other High Risk Pathogen Preparedness

The 2014-2015 Ebola epidemic in West Africa was the largest in history with over 28,600 cases and over 11,300 deaths. With the first imported case into the US, DHHA's Ebola preparedness activities were put into place, and a comprehensive plan to safely care for Ebola patients was quickly completed. The Ebola plan and preparedness work was validated by CDPHE , CDC, and National Ebola Training and Education Center (NETEC). In 2015, DH was recognized by the CDC to be the Department of Health & Human Services (HHS) Region 8 Ebola & Special Pathogens Regional Treatment Center (RESPTC). DH was awarded $3 million dollars to continue to enhance its Ebola and other high risk pathogen program over the next 5 years (2015 – 2020). In 2018, Infection Prevention (IP) had several achievements including:

1. Completed and exceeded all grant deliverables by stated deadlines. DH met and exceeded the exercise deliverables required to maintain the RESPTC designation including perform quarterly hospital, state, regional, and federal exercises. IP participated in an annual NETEC site visit to evaluate DHHA's capability to care for patients with high risk pathogens. Additionally, DH continually acquires and inventories supplies for trainings, exercises, and potential treatment needs.

2. Conducted quarterly staff personal protective equipment (PPE) practice, drills, and simulation training. IP continued to train and track staff competency in donning and doffing high level PPE.

3. Supported 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.

4. Provided regional mentorship and education. DH 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.

2019 Goals:
Infection Prevention will continue to work to lead the preparation work to safely transport and care for patients with Ebola or other high-risk pathogens. Some of the activities will include:

1. Meet all grant deliverables such as annual updates of the hospital-wide Ebola Emergency Operations Plan, outlining improvement plans, and ensuring supplies and training are supportive of the needs of Denver Health's role as a RESPTC for HHS Region 8.

2. Conduct and participate in hospital, state, regional, and federal exercises in conjunction with federal partners to assess logistical capabilities and communication capacities across the RESPTCs.

3. Evaluate and improve the state (Colorado) and regional (HHS Region VIII) Concept of Operations Plan for high risk pathogens.

4. Serve as a regional resource and support for facilities in Colorado and HHS Region VIII.

5. Expand beyond the Ebola Emergency Operations Plan to develop plans specifically addressing and preparing for other high risk infectious diseases. Efforts will be focused on improving the emerging infectious disease plan, developing a respiratory surge plan, and a high risk airborne transmission pathogen plan in conjunction with the Emergency Preparedness Coordinator.

6. Optimize Epic to better facilitate and support the HITeam and biocontainment unit for suspected and confirmed patients with Ebola or special pathogens.

7. Expand and refine the process for asking travel history questions in the screening, admissions, and intake areas of the hospital to reflect real-world infectious disease outbreaks.

8. Design, build, and operationalize a simulation center to support training and education of DH's hospital staff, including the HITeam for Ebola and special pathogens.

9. Plan and host national workshops on Emerging Infectious Diseases in collaboration with the NETEC.

10. Initiate Denver Health as a Special Pathogen Research Network site for investigational therapies and vaccinations for high risk pathogens beginning with ZMapp.

10.8. Patient Equipment Cleaning

Shared medical equipment – low level disinfection:
On routine rounds, it was determined that shared medical equipment such as Dynamaps (blood pressure cuff, thermometer, pulse oximeter), language line telephones, ultrasound machines, bladder scanners, EKG machines, phlebotomy carts, and IV poles and pumps were inadequately cleaned between patients. The IP staff performed ATP swabs of these items on select inpatient floors and found that the most opportunity to improve cleanliness was by targeting the Dynamaps and other mobile patient equipment (MPE). With input from the front line staff members, the team developed a cleaning protocol to encompass (1) cleaning between every patient use; and (2) daily deep cleaning. It was implemented on four pilot floors, and initial results showed a 70% decrease in ATP levels on these floors (Figure 11.8-1). The results identified an opportunity for growth in improving hospital-wide patient equipment cleaning beyond the 4 pilot floors.

Figure 10.8-1: ATP Relative Light Unit trend for shared medical equipment
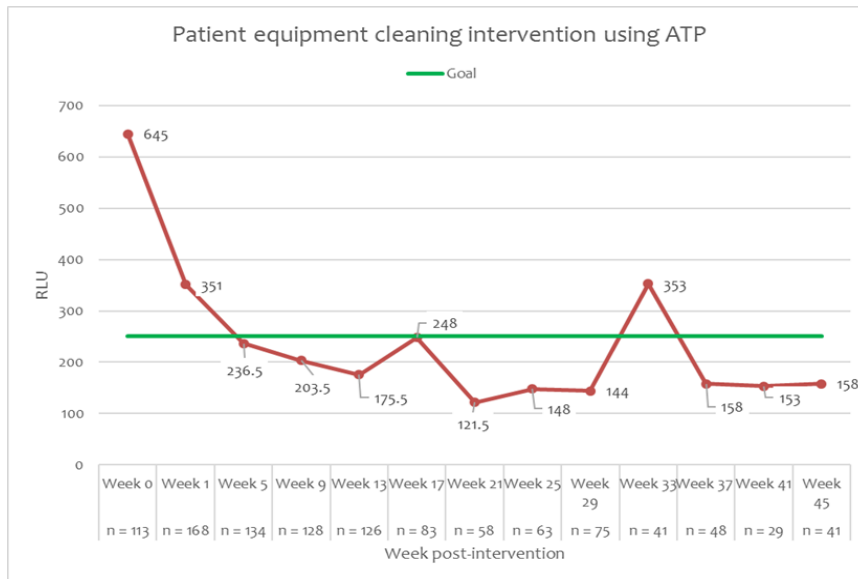
Beginning in 2018, a multi-disciplinary team participated in a LEAN event to identify best practices and improve efficiency and effectiveness of patient equipment cleaning. The three-part series is working to develop a comprehensive patient equipment policy with designated roles, an evaluation plan for patient equipment cleaning, and standard work for all parties involved in patient equipment cleaning. In 2019, the IP team will focus on the policy roll out, education, and ongoing evaluation of patient equipment cleaning by clinical staff and ancillary services. The mobile patient equipment ATP program will restart during 2019.

2019 Goals:
Continue work on standardization of high level disinfection across the organization including:

1. Develop standard work for all Ortho-Phthalaldehyde (OPA) and Trophon high level disinfection in both inpatient and outpatient clinics

2. Annual competencies for all staff performing high level disinfection

3. Biweekly audits on all high level disinfection areas for 3 months or longer depending on results

4. HLD council

Patient Equipment Cleaning
1. Expansion of the Dynamap and language line telephone cleaning protocols to all inpatient areas and to all outpatient clinics.

2. Low level disinfection standard work and process improvement will be addressed in an organizational wide Lean Value Stream Event.

3. Development and dissemination of a low-level patient equipment cleaning policy.

10.9. Beyond Hospital-Acquired Infections

Sexually transmitted diseases (STDs)

In 2018, OBHS hired a new attending, Hermioine Hurley. Dr. Hurley provides infectious disease expertise and offers clinic visits to intervene on high risk behaviors and STD rates among the OBHS patient population. Over 2018, Dr. Hurley has successfully supported and facilitated patients to begin therapy for STDs who previously refused to undergo therapeutics. OBHS staff continues to provide referrals and education to patients to receive care and support both at Denver Health Medical Center and other community resources.

Skin and soft tissue infection in persons who inject drugs

In 2018, the OBHS team developed a comprehensive skin assessment program and toolkit. One component of the skin assessment program was the creation of free wound care kits for patients in conjunction with Infection Prevention. 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.

An in-service was provided to OBHS staff from the outpatient wound care nurse at Denver Health with additional in-services scheduled for 2019. The success of the program will be measured using data collected by the methadone clinic. OBHS will be documenting the rate at which methadone clinic patients are admitted to the ED after receiving a wound care kit. In 2018, 70 patients had subsequent ED visits after receiving a wound care kit. Further work will be initiated to track this metric over time.

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.

11. ANTIBIOTIC STEWARDSHIP (AS)

11.1. Analysis of 2018 Goals

The AS Program maintained the following interventions and surveillance activities with goals of optimizing antibiotic use in order to maximize good clinical outcomes and prevent antibiotic resistance, *C. 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 AS Pager) for broad-spectrum, toxic, or high-cost antibiotics
- Daily 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 AS smartphone application and the AS 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 aggregated antibiotic utilization data to MICU and outpatient Internal Medicine providers
- Stewardship of infectious diseases diagnostic tests

The following Figures (11.1-1—11.1-3) illustrate that over the last 3 years at Denver Health, total antibiotic use and use of antibiotics with a broad spectrum of gram-positive and gram-negative activity have remained relatively stable, reflecting the maintenance of the above-listed interventions. The antibiotic utilization data collection methodology changed with the implementation of Epic in April 2016; therefore, pre– and post-Epic data may not be directly comparable.
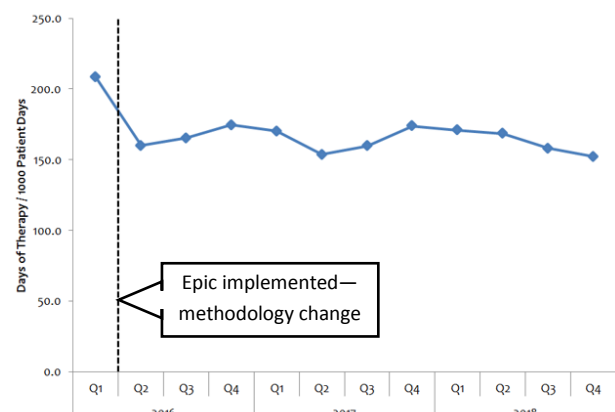
Figure 11.1-1: Total Antibiotic Use
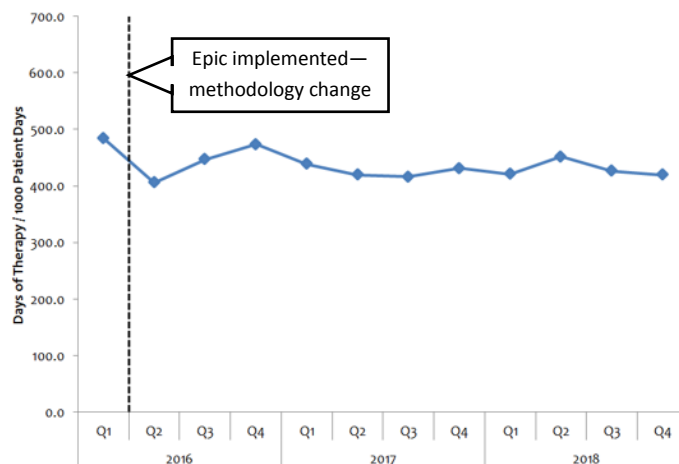
Figure 11.1-2: Antibiotics with Activity Against MRSA
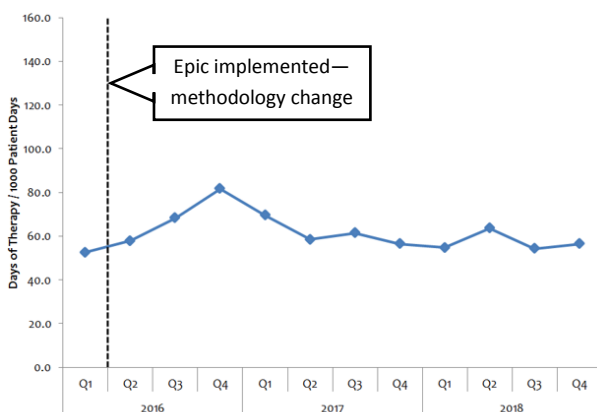
Figure 11.1-3: Antibiotics with Gram-Negative Activity

In 2018, the AS Program focused on developing and implementing two new initiatives:

1. Long-acting lipoglycopeptide infusions to complete therapy and reduce length of stay for select patients receiving prolonged inpatient IV antibiotic courses

An increasing number of patients are being kept in the hospital for prolonged intravenous (IV) antibiotic courses (4—8 weeks) for serious infections when outpatient IV antibiotic therapy is not thought to be safe or feasible and placement is not an option (e.g. injection drug users). This is a burden for our patients, puts them at risk for hospital-acquired infections, and strains Denver Health's limited resources. Safely shortening these hospitalizations would substantially benefit our patients and Denver Health. We developed a treatment approach to shorten hospitalization in these patients. In cases where 4—8 weeks of inpatient IV antibiotics are planned, the final 7—10 days of therapy will be given as single infusion of dalbavancin—a relatively new antibiotic with a prolonged half-life requiring only once weekly dosing—allowing for earlier hospital discharge.

Goal: Reduce the length of hospital stay required for patients with serious bacterial infections kept inpatient only for safe administration of long-term IV antibiotics

Outcome measures:
A.   Number of patients receiving long-acting lipoglycopeptide infusions
B.   Inpatient days averted
C.   Rate of clinical success after completion of treatment with lipoglycopeptide

Progress to date and results:
Dalbavancin was reviewed by the Antimicrobial Subcommittee of P&T and recommended to be added to the formulary in early 2018. This formulary addition was approved by P&T in March 2018. The first patient received dalbavancin in April 2018.

From April 2018 – March 2019, **13 patients who were receiving prolonged inpatient IV antibiotic therapy were given an infusion of dalbavancin** to complete treatment and facilitate earlier discharge. Based on the planned treatment end dates for these patients, **this resulted in a total of 97 averted hospitals days (average of 7.5 days averted per use).** Taking into account costs of the antibiotic and an estimated $1800 per non-ICU day of hospital care, this resulted in a **total of $135,600 in cost savings to Denver Health**. A formal assessment of clinical outcomes will be undertaken; however, we are not aware of any significant adverse events associated with the infusions or after discharge.

2. Development of a penicillin (PCN) allergy skin testing program

We developed a standardized process through which the AS Program will perform structured allergy assessments of patients with a reported PCN allergy followed by penicillin skin testing (PST) in appropriate cases.

Goal: Optimize choice of antibiotic therapy by confirming or refuting the presence of a PCN allergy in inpatients with a reported PCN allergy

Outcome measures:
A.   Number of patients evaluated by skin testing program
B.   Number of patients with PCN allergy de-labeled by history alone
C.   Number of patients who undergo PCN skin testing
D.   Number of patients with PCN allergy de-labeled by skin testing
E.   Number of MICU beta-lactam desensitizations averted

Progress to date:
A standardized process for the AS Program to assess patients with a documented PCN allergy has been developed. The protocol was presented and approved at the Antimicrobial Subcommittee of P&T and later at P&T. After the protocol was finalized, the AS program underwent formal training to perform PST in November 2018. The IT components (order set build, smartphrases, and consult order) were completed in early 2019. The PST program is expected to go-live by the end of April 2018.

11.2. Other 2018 Achievements

- Denver Health was named as one of only 25 hospitals in the U.S. designated as an Antimicrobial Stewardship Center of Excellence by the Infectious Diseases Society of America.

- Denver Health was awarded a grant by the Society of Infectious Diseases Pharmacists to start an Infectious Diseases Pharmacy Residency program for the 2019-2020 academic year.

- Inappropriate *C. difficile* testing was reduced through Epic-related diagnostic stewardship interventions.

- We surveyed emergency department and urgent care clinicians regarding use and perceptions of the Denver Heath antibiotic stewardship application. 95% of respondents considered themselves to be regular users of the application, and 85% reported it to be a 'very useful' clinical resource. The results were presented at the national IDWeek meeting in San Francisco in October, 2018 and a manuscript is pending submission.

- The AS Program worked closely with Microbiology laboratory to update susceptibility reporting of cefazolin for several urinary pathogens to more accurately present the results to clinicians.

- 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.

- A pharmacist-managed procalcitonin protocol and formal antibiotic timeout for the MICU was implemented Q1 2018. Since implementation, procalcitonin is utilized more appropriately and in accordance with the institutional protocol. This new protocol likely also contributed to the statistically significant reduction in total MICU antibiotic use, use of broad spectrum gram-negative agents, and use of broad spectrum gram-positive agents in Q1 2018 compared to Q1 2017.

- A medication use evaluation (MUE) was performed on the antibiotic selection for grade 3 open fracture prophylaxis. Results of this MUE were presented at the American Society of Health System Pharmacists annual Midyear Clinical Meeting. The results will also be used to add formal guidance to the DH Perioperative Antibiotic Prophylaxis guideline.

- A protocol to administer a probiotic to patients receiving high risk for *C. difficile* infection antibiotics in the hospital to prevent antibiotic-associated diarrhea and C. difficile infection was implemented in March, 2017. Providers are ordering the probiotic approximately 95% of the time that one of the target antibiotics is ordered. The implementation of this process and initial safety outcomes were presented at the national IDWeek meeting.

- The AS Program continues to facilitate the use of fecal microbiota transplants for patients with recurrent *C. difficile* infection through procuring frozen, pre-screened specimens from a company called OpenBiome. More than ten procedures have been performed to date with positive results.

11.3. Goals for the 2019 Antibiotic Stewardship Program

In 2019, the AS Program will maintain 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, Clostrdium difficile infection, and antibiotic-related adverse events:

- Quarterly antibiotic utilization and cost surveillance
- Development of antibiograms and assessment of resistance trends
- Formulary restriction and pre-authorization (via the Antibiotic Stewardship Pager) for broad-spectrum, toxic, or high-cost antibiotics
- Daily post-prescription review with real-time prescribing recommendations
- 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
- Active Antimicrobial Subcommittee of P&T

- Submission of antibiotic utilization data to the CDC/NHSN Antibiotic Use module
- Feedback of individualized and aggregate antibiotic utilization data to MICU and outpatient Internal Medicine providers
- Stewardship of infectious diseases diagnostic tests

In addition, the penicillin skin testing program that was developed during 2018 will be officially launched in April 2019.

Based on a needs assessment completed in December 2018 by the AS Program committee and Chief Quality Officer, the AS Program will focus on the development and implementation of the following new initiatives in 2019.

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

The opiate epidemic has resulted in increasing numbers hospitalizations of persons who inject drugs for severe bacterial infections, such as endocarditis and bone or joint infections. These infections often require 4—8 weeks of 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. As described above, the use of dalbavancin infusions in select patients has led to shorter durations of hospital stays for some patients; however, extended hospitalizations are still the norm. For 2019, Denver Health has developed an exciting new partnership with Sobriety House whereby these patients will be 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.

Goals: 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.

Planned metrics:
- Antibiotic treatment completion rates
- Retention in addiction treatment
- Length of hospital stay
- Hospital readmission rate

2. Integration of PGY-2 pharmacy residency into stewardship program

Denver Health was awarded a grant by the Society of Infectious Diseases Pharmacists to start an Infectious Diseases Pharmacy Residency program for the 2019-2020 academic year. On a longitudinal basis, the resident will perform prospective review with provider feedback and preapproval of restricted antibiotics, update existing and develop new clinical care guidelines, serve as primary preceptor for a pharmacy student or resident, as well as provide education to pharmacists, providers, other healthcare providers, and patients as needed. The resident will also serve as the ID pharmacy expert for the General ID Consult service, Orthopedi 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.

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

Planned metrics:
- Interventions made by resident
- Cost savings associated with interventions
- Completion of research project
- Completion of medication use evaluation or QI project
- Number of penicillin skin tests performed
- Number of staff education sessions presented

3. Individualized prescribing feedback to Hospitalists with peer comparison

In the outpatient setting, the intervention of providing clinicians with individualized feedback on their antibiotic prescribing

Patterns with comparison to peers has been shown to reduce antibiotic prescribing for conditions where antibiotics are not indicated. In 2019, we plan to extend this successful intervention to the inpatient setting in a collaborative intervention with Hospital Medicine. We are initially developing a metric of provider-specific IV vancomycin use. On a quarterly basis, this metric will be reported back to individual Hospitalists along with a measure of how his or her vancomycin utilization compares to peer Hospitalists. Hospitalists are the largest prescribers of antibiotics in the hospital, and vancomycin is one of the most commonly used antibiotics in the hospital; thus, this intervention has the potential to substantially impact inpatient antibiotic use. If successful, the intervention may also be extended to other antibiotics or to prescribing for specific types of infections.

Goals: Improve antibiotic utilization among Hospitalists through regular, structured feedback regarding individual antibiotic use and comparison with peers

Planned initial metrics:
- Individual provider metric—Total days of vancomycin therapy administered, standardized per number of days attended
- Intervention metric—change in overall vancomycin utilization for the Hospitalist group, as measured by days of vancomycin per 1000 patient census days
- Number of vancomycin starts and discontinuations

APPENDIX A: GLOSSARY OF TERMS AND ABBREVIATIONS

A-B

ACS.....Ambulatory Care Services
ADA.....American Diabetes Association
ADE.....Adverse Drug Events
AHRQ.....Agency for Healthcare Research and Quality
ALTO.....Alternatives to Opioids
AMI.....Acute Myocardial Infarction
AOC.....Administrator on Call
APM.....Alternative Payment Model
API.....Application Programming Interface
APP.....Advanced Practice Providers
APS.....Adult Protective Services
AQA......Ambulatory Quality and Accountability
AQIDC.....Ambulatory QI and Design Committee
ARRA.....American Recovery and Reinvestment Act
AS.....Antibiotic Stewardship
ASPEN.....American Society for Parenteral and Enteral Nutrition
ATP.....Adenosine Triphosphate
AU.....Antibiotic Use
BB.....Bounce backs
BBPE.....Bloodborne Pathogen Exposure
BERT.....Behavioral Health Emergency Response Team
BG.....Blood Glucose
BH.....Behavioral Health
BHO.....Behavioral Health Organization
BMI.....Body Mass Index
BPA.....Best Practice Advisory

C

CABG.....Coronary Artery Bypass Graft
CAHPS.....Consumer Assessment of Healthcare Providers and Systems
CAUTI.....Catheter-Associated Urinary Tract Infection
CDC.....Centers for Disease Control and Prevention
CDS...Clinical Decision Support
CDI.....Clinical Documentation Integrity
CDI....*Clostridiodes difficile* Infection
CDIS.....Clinical Documentation Improvement Specialist
CDPHE.....Colorado Department Public Health and Environment
CLABSI......Central Line-Associated Blood Stream Infection
CMS.....Centers for Medicare & Medicaid Services
COPD.....Chronic Obstructive Pulmonary Disorder
COSH.....Center for Occupational Safety and Health
CPOE.....Computerized Provider Order Entry
CQL.....Clinical Quality Language
CQM.....Clinical Quality Measure
CRE......Carbapenem-resistant *Enterobacteriaceae*
CT.....Computed Tomography
CVD..... Cardiovasular Disease
CY.....Calendar Year

D

DH.....Denver Health
DHEG.....DH East Grand Community Clinic and Emergency Center
DHHA....Denver Health and Hospital Authority
DI.....Deterioration Index
DPSQ.....Department of Patient Safety and Quality
DRG.....Diagnosis Related Group
DVT.....Deep Vein Thrombosis

E-F

ECG.....Electrocardiogram
eCQM.....Electronic Clinical Quality Measures
ED.....Emergency Department
EH.....Eligible Hospital
eHH.....Electronic Hand Hygiene
EHR.....Electronic Health Record
EMP.....Emergency Management Program
EMR.....Electronic Medical Record
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 Administration
FFP.....Fresh Frozen Plasma
FFS.....Fee for Service
FFY.....Federal Fiscal Year
FMEA.....Failure Modes and Effects Analysis
FOBT.....Fecal Occult Blood Test
FQHC.....Federally Qualified Health Center
FUH...Follow Up after Hospitalization
FY.....Fiscal Year

G-H

HAC.....Hospital-Acquired Condition
HAI.....Healthcare-Associated Infection
HAPI.....Healthcare Acquired Pressure Injuries
HBIPS.....Hospital-Based Inpatient Psychiatric Services
HCC.....Hospital Command Center
HCW.....Healthcare Workers
HCAHPS.....Hospital Consumer Assessment of Healthcare Providers and Systems
HCPF.....Colorado Department of Health Care Policy and Financing
HEDIS.....Healthcare Effectiveness Data and Information Set
HEN.....Hospital Engagement Network
HERT.....Hazardous Emergency Response Team
HF.....Heart Failure
HH......Hand Hygiene
HHS......Health and Human Services
HIM.....Health Information Management
HIS.....Health Information System
HIT.....Health Information Technology
HITeam.....High Risk Infection Team
HIIN...Hospital Improvement Innovation Network
HLD.....High Level Disinfection

I-L

ICRA…..Infection control risk assessment
ICD…..International Classification of Diseases
ICU…..Intensive Care Unit
IMM…..Influenza Immunization
I&O…..Input and Output
IP…..Inpatient
IP…..Infection Prevention
IPC…..Infection Prevention Committee
IPF…..Inpatient Psychiatric Facility
IPFQR…..Inpatient Psychiatric Facility Quality Reporting
IPF-SUB…..Alcohol Use
IQR…..CMS Inpatient Quality Reporting Program
IQR…..Interquartile Range
IV…..Intravenous
IVAC…..Related Ventilator Associated Condition
JC…...Joint Commission
KPC…..*Klebsiella pneumoniae* Carbapenemase
LDI…...Leadership Development Institute
LWID…..

M

MCC…..Major Complication or Comorbidity
MCI…..Mass Casualty Incident
MDRO…...Multi-Drug Resistant Organisms
MHCD…...Mental Health Center of Denver
MICU…...Medical Intensive Care Unit
MIPS…..Merit-Based Incentive Payment System
MME…..Morphine Milligram Equivalent
MPE…..Mobile Patient Equipment
MRI…..Magnetic Resonance Imaging
MRSA…...Methicillin-resistant *Staphylococcus aureus*
MTP…..Massive Transfusion Protocol
MU…..Meaningful Use
MUE…..Medication Use Evaluation

N

NDNQI…..The National Database of Nursing Quality Indicators
NETEC…..National Ebola Training and Education Center
NHSN…..National Healthcare Safety Network
NICU…...Neonatal Intensive Care Unit
NIMS…..National Incident Management System
NPSG…..National Patient Safety Goals

O

OB/GYN…..Obstetrics and Gynecology
OBHS…..Outpatient Behavioral Health Services
O/E…..Observed to Expected Ratio
OMFS…..Oral and Maxillofacial Surgery
OPA…...Ortho-Phthalaldehyde
OPPE…..Ongoing Physician Performance Evaluations
OPPS…..Outpatient Prospective Payment System
OQR…..CMS Hospital Outpatient Quality Reporting
OR…...Operating Room
OT…..Occupational Therapy

P

PC…..Perinatal Care Conditions
PCMH…..Patient Centered Medical Home

PCN…..Penicillin
PCU…...Progressive Care Unit
PDMP…..Prescription Drug Monitoring
PE…..Pulmonary Embolism
PEDUC…..Pediatric Emergency Department and Urgent Care
PFAC…..Patient Family Advisory Council
PFS…..Physician Fee Schedule
PI…..Process Improvement
PI…..Promoting Interoperability
PICU…...Pediatric Intensive Care Unit
PN…..Pneumonia
POA…..Present on Admission
POC…..Point of Care
PPE…..Personal Protective Equipment
PRBC…..Packed Red Blood Cells
PSI…..Patient Safety Indicator
PST…..Penicillin Skin Testing
P&T…..Pharmacy and Therapeutics
PUI…..Person Under Investigation
PVAP…..Probable Ventilator Associated Pneumonia

Q

Q&A…..Quality and Accountability
QI…..Quality Improvement
QPP…..Quality Payment Program
QRUR…..Quality and Resource Use Report

R

RAF…..Risk Adjustment Factor
RBC…..Red Blood Cell
RCCO…..Regional Care Collaborative Organization
RESPTC…..Regional Ebola & Special Pathogens Treatment Center
RHC…..Rural Health Clinic
RN…..Registered Nurse
ROM…..Risk of Mortality

S

SAFE…..Stop the Addiction Fatality Epidemic
SEP…..Severe Sepsis and Septic Shock
SI…..Safety Intelligence
SICU…..Surgical Intensive Care Unit
SIR…...Standardized Infection Ratio
SOI…..Severity of Illness
SOP…..Standard Operating Procedures
SPM…..Sterile Process Management
SR…..Service Recovery
SSI…...Surgical Site Infection
STD…..Sexually Transmitted Diseases
STK…..Stroke Measures
SUR…...Standardized Utilization Ratio

T-U

TBD…..To Be Determined
TBI…..Traumatic Brain Injury
TCPI…..Transforming Clinical Practice Initiative
THA….Total Knee Arthroplasty
TKA…..Total Knee Arthroplasty
TIN…..Tax Identification Number

TJC…..The Joint Commission
TOB…..Tobacco Use
TOC…..Transitions of Care
TPN……Total Parenteral Nutrition
TQIP…...Trauma Quality Improvement Program
UTI…..Urinary Tract Infection
UV…..Ultra Violet

V-Z

VAE…...Ventilator Associated Events
VAIC…..Vascular Access-Infusion Therapy Council
VAP…..Ventilator Associated Pneumonia
VBP…..Value Based Purchasing
VLBW…..Very Low Birth Weight
VOC...Voice of the Customer
VON…..Vermont Oxford Network
VRE…..Vancomycin-resistant enterococci
VRSA…..Vancomycin Resistant *Staphylococcus aureus*
VSA…..Value Stream Analysis
VTE…..Venous Thromboembolism
WHO…...World Health Organization
WQ…..Workqueue

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