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Increasing Adherence to Care Bundle Guidelines to Decrease Colon Surgical Site Infections

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The Team

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- **Sponsors**
 - Jim Barker, MD, Maureen Miller, Robert Kutschman



AIM Statement

- Decrease Surgical Site Infections on patients undergoing elective colon procedures (Laparoscopic, robotic and/or open) from a standardized infection ratio (SIR) of 1.370 to a consistent standardized ratio of less than 1 by increasing the adherence to care bundle guidelines from 0% to 80% by 2nd Quarter 2017



*SIR = Observed # SSI/Expected # SSI.

Expected # SSI = # operations in each procedure risk category X risk-stratified model rate/100

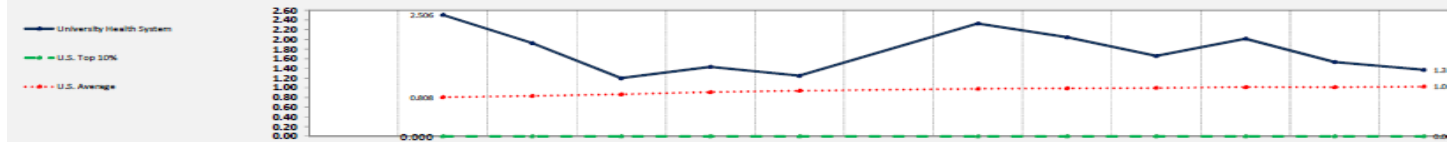
Value >1.0 = more SSIs than expected. 1.0 indicates your hospital is the same as national comparison data

Baseline Data

Value-Based Purchasing (VBP) Measure Trends Analysis Safety of Care Domain Measures University Health System

The graphs in this analysis are set to display hospital performance relative to national performance standards (the U.S. average and U.S. top 10%). As a result, the axis for each chart varies.

HAI_3: Surgical Site Infection - Colon (Lower Scores Are Better)



Scheduled Quarterly Release	Sept. 2013	Dec. 2013	Mar. 2014	June 2014	Sept. 2014	Dec. 2014	Mar. 2015	June 2015	Sept. 2015	Dec. 2015	Mar. 2016	June 2016	
Next Collection Dates	Jan. 1, 2013 - Dec. 31, 2013	Apr. 1, 2013 - Mar. 31, 2013	Jul. 1, 2013 - June 30, 2013	Oct. 1, 2013 - Sept. 30, 2013	Jan. 1, 2013 - Dec. 31, 2013	Apr. 1, 2013 - Mar. 31, 2014	Jul. 1, 2013 - June 30, 2014	Oct. 1, 2013 - Sept. 30, 2014	Jan. 1, 2014 - Dec. 31, 2014	Apr. 1, 2014 - Mar. 31, 2015	Jul. 1, 2014 - June 30, 2015	Oct. 1, 2014 - Sept. 30, 2015	
Spital Performance	No Data	2,506	1,924	1,198	1,433	1,249	No Update	2,326	2,043	1,657	2,013	1,532	1,370
U.S. Top 10%	No Data	0.000	0.000	0.000	0.000	0.000	No Update	0.000	0.000	0.000	0.000	0.000	0.000
U.S. Average	No Data	0.808	0.832	0.867	0.912	0.942	No Update	0.981	0.992	0.999	1.015	1.014	1.026
U.S. Rank	No Data	1950 of 2006	1842 of 2005	1504 of 2011	1632 of 2032	1467 of 2036	No Update	1948 of 2050	1853 of 2035	1701 of 2047	1850 of 2050	1641 of 2050	1451 of 11
Site Rank	No Data	150 of 153	139 of 152	115 of 152	133 of 155	124 of 153	No Update	149 of 151	142 of 149	136 of 152	136 of 146	133 of 151	122 of 11

Applicable to the 2016, 2017, 2018 and 2019 VBP Programs.

HAI_4: Surgical Site Infection - Abdominal Hysterectomy (Lower Scores Are Better)

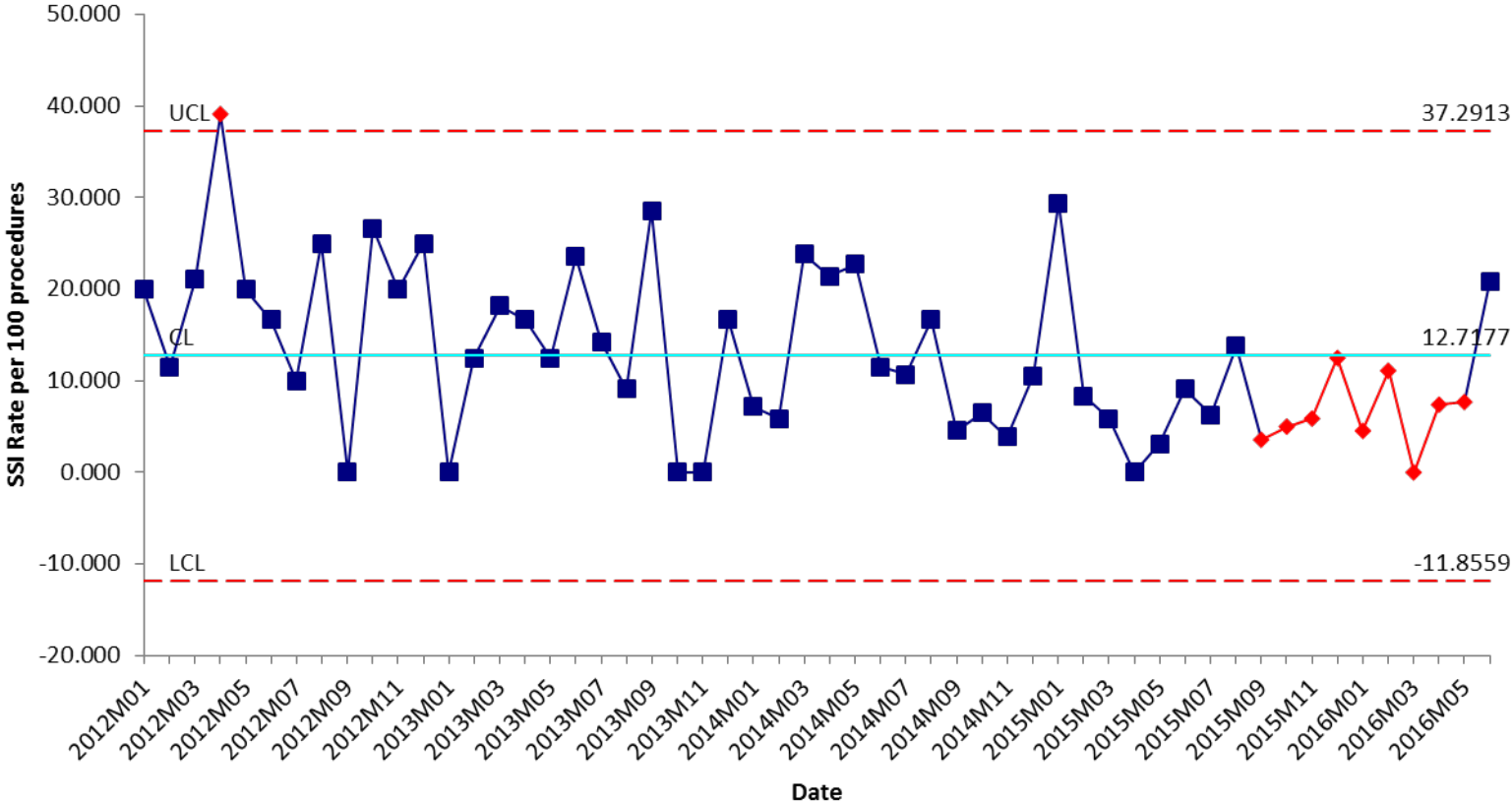


Scheduled Quarterly Release	Sept. 2013	Dec. 2013	Mar. 2014	June 2014	Sept. 2014	Dec. 2014	Mar. 2015	June 2015	Sept. 2015	Dec. 2015	Mar. 2016	June 2016	
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Spital Performance	No Data	1,701	2,130	1,974	2,322	2,205	No Update	2,161	2,413	2,343	2,644	2,269	1,725
U.S. Top 10%	No Data	0.000	0.000	0.000	0.000	0.000	No Update	0.000	0.000	0.000	0.000	0.000	0.000
U.S. Average	No Data	0.934	0.905	0.900	0.877	0.907	No Update	0.909	0.915	0.877	0.866	0.850	0.865
U.S. Rank	No Data	684 of 819	744 of 811	734 of 817	772 of 829	758 of 828	No Update	752 of 832	792 of 849	804 of 861	836 of 870	834 of 876	737 of 81
Site Rank	No Data	59 of 66	64 of 67	65 of 70	71 of 73	72 of 76	No Update	71 of 75	71 of 73	75 of 76	73 of 74	70 of 75	64 of 74

Applicable to the 2016, 2017, 2018 and 2019 VBP Programs.

UHS Colon SSI Rate

COLO All SSI Rate



Background

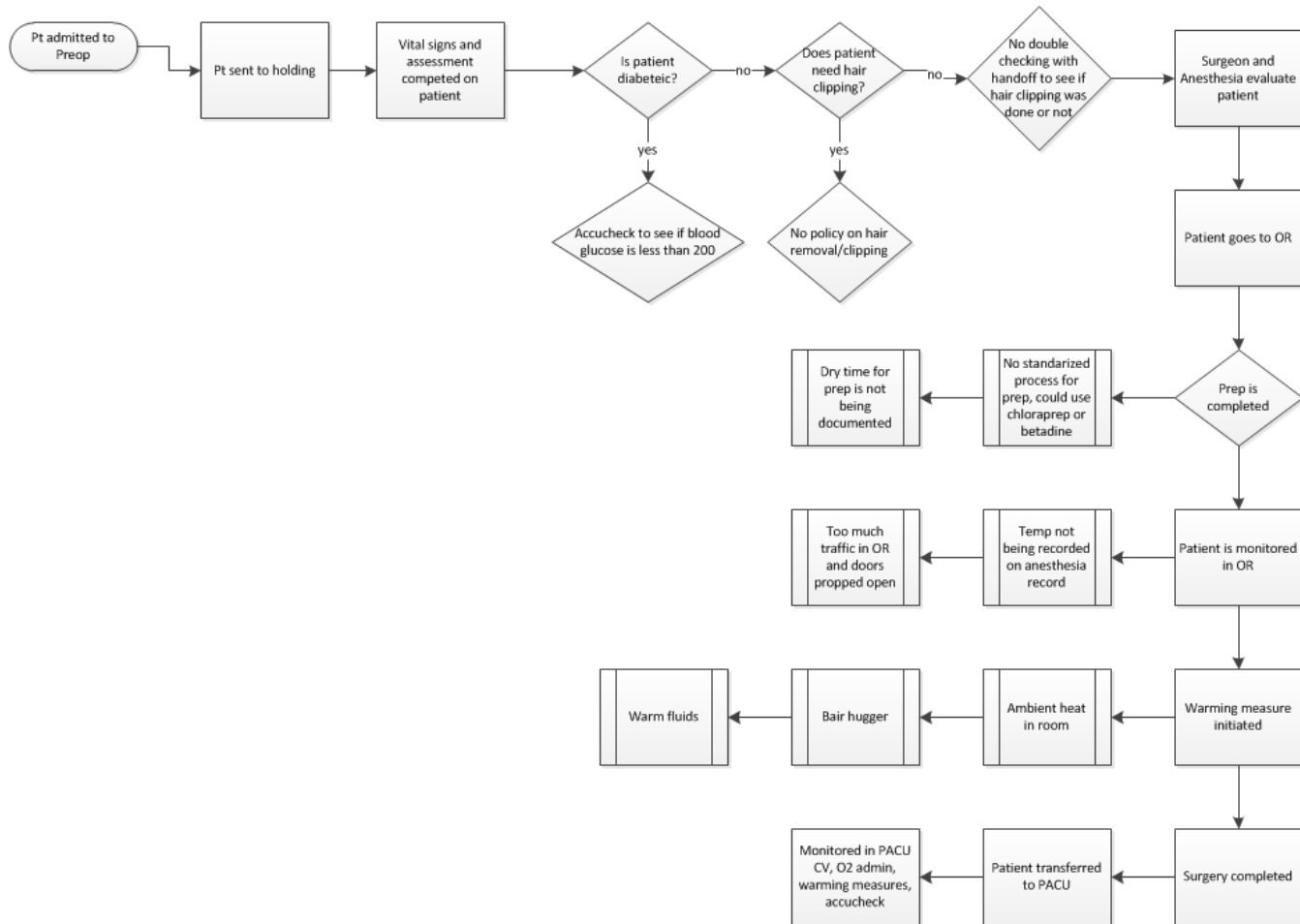
- Abdominal surgical site infection represent a significant portion of healthcare associated infections. Surgical site infections can lead to increased length of stay, increased cost and to mortality. 75% of death among patients with surgical site infections are directly attributable to lack of standardized methods for pre-surgical preparation.



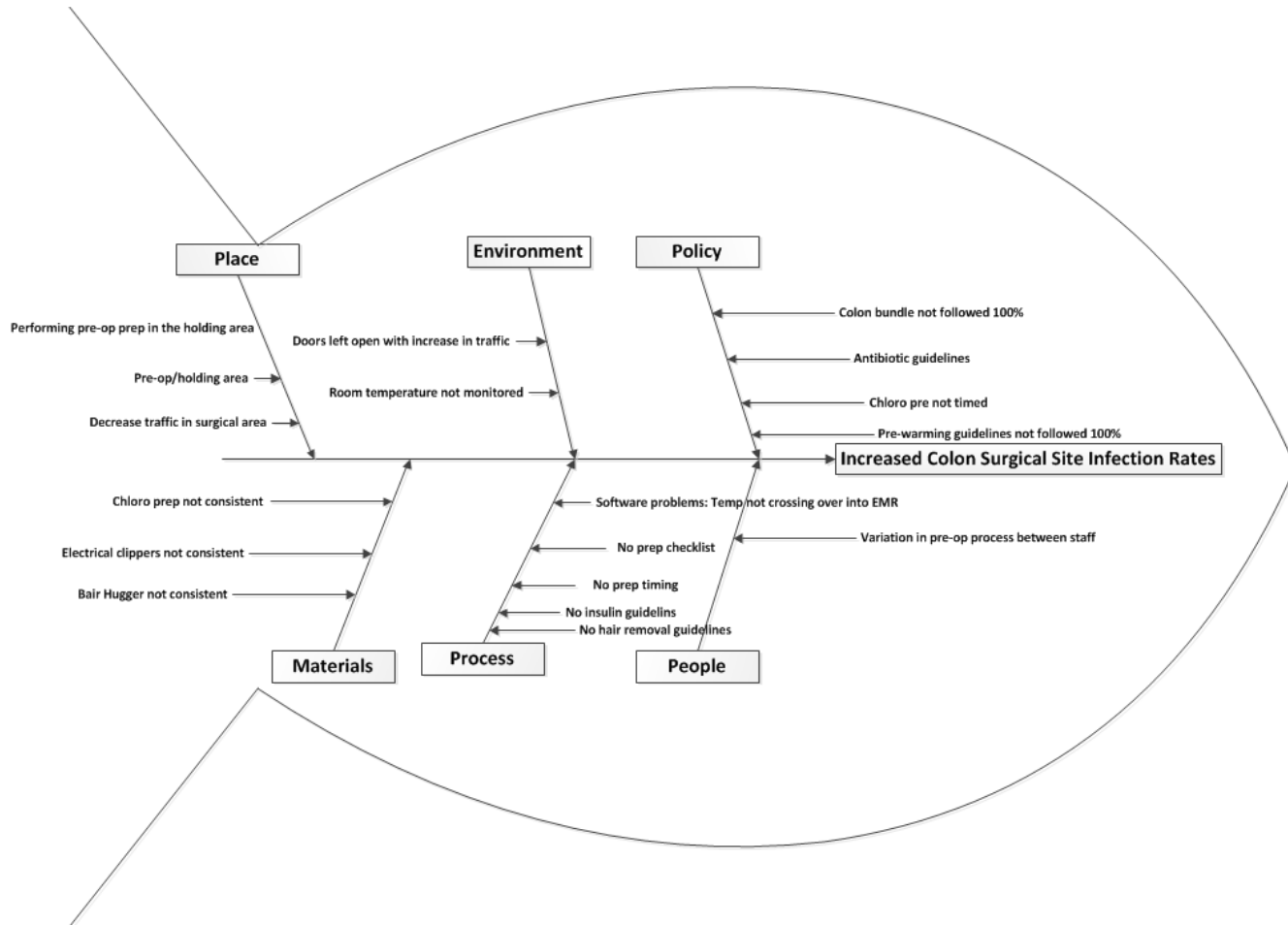
Reference:

Berrios-Torres, S. (2009) Surgical Site Infection (SSI) Toolkit. Centers for Disease Control and Prevention. Retrieved from <http://www.cdc.gov/HAI/ssi/ssi.html>

Flowchart



Fishbone



Evidence-Based Strategies to Prevent SSIs

1. Optimize antimicrobial dosing
2. Avoid shaving surgical site hair
- 3. Maintain perioperative normothermia**
4. Perioperative glucose control
5. Optimize tissue oxygenation
- 6. Use of a surgical safety checklist**
- 7. Minimize OR traffic**
- 8. Surgical prep-chloroprep if not contraindicated**



Surgical Site Infections Guidelines

_____ SURGICAL SITE INFECTION WHO GUIDELINES _____ patient sticker

Procedure _____

Patient risk factors for SSI DM _____ smoking _____ wound class _____ age _____

PREOPERATIVE HOLDING AREA

1. Temp oral _____ skin _____
2. Bair Hugger on? yes _____ no _____ patient refused (too warm) _____
3. Accucheck if diabetic _____ Insulin given? _____ units Accucheck after insulin _____
4. Hair clipping none _____ minimal _____ other _____ in Holding _____ on OR _____

INTRAOPERATIVE

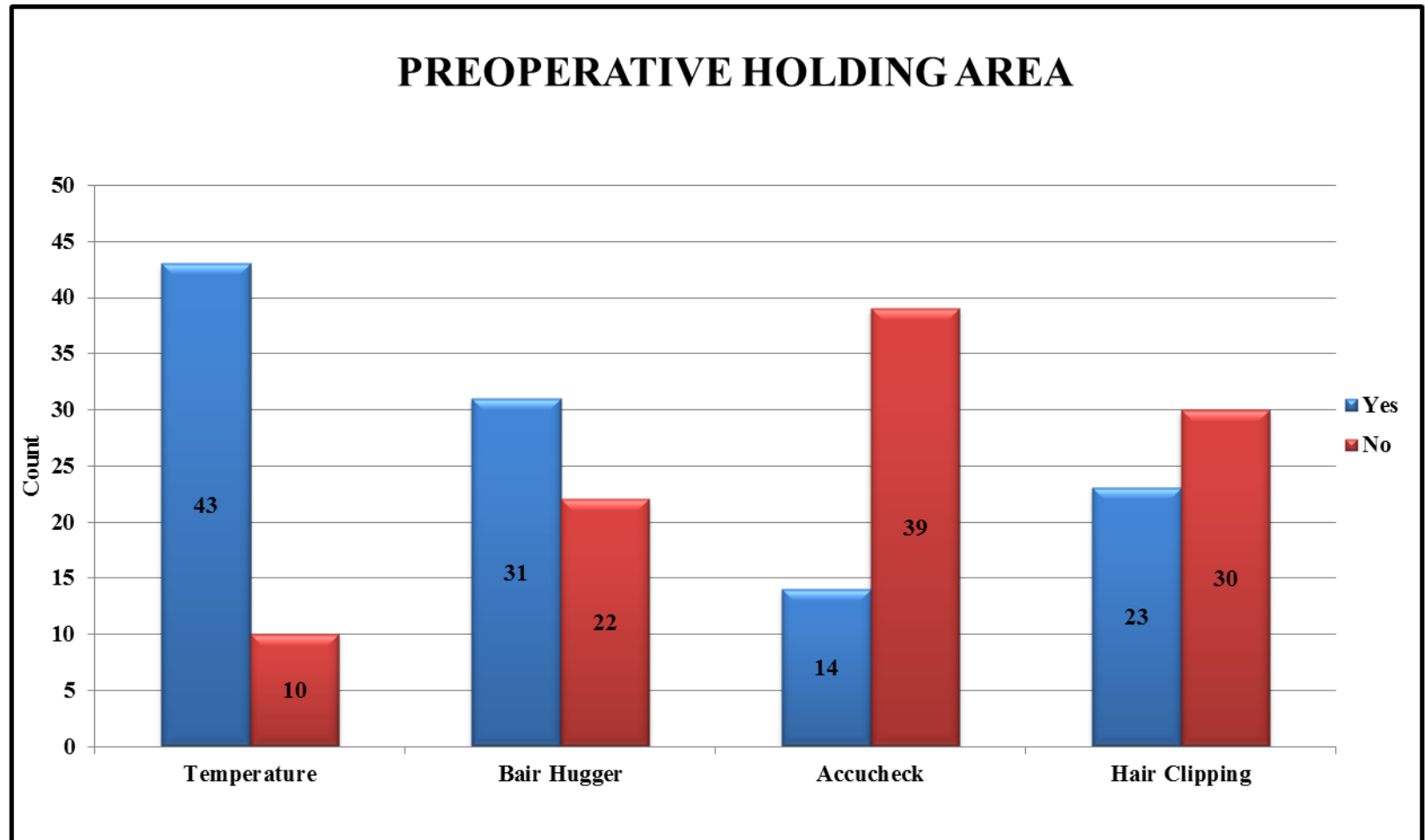
1. Prep Chloraprep _____ other _____
2. Three minutes wait between finishing prep and surgical incision _____ timed? _____
3. Temperature monitored and recorded on anesthesia record _____
4. Lowest temp in OR _____ Average temp in OR _____ esoph. nasal skin
5. Warming measures Bair hugger _____ Fluid warmer _____ OR room warming _____
6. Appropriate antibiotic administration? Antibiotic _____
Within 60 minutes of incision (120 minutes for vancomycin)? _____
7. Percent Oxygen? _____ %
8. OR Traffic Doors closed _____ Sign on door? _____ Traffic minimized _____

POSTOP ANESTHESIA CARE UNIT

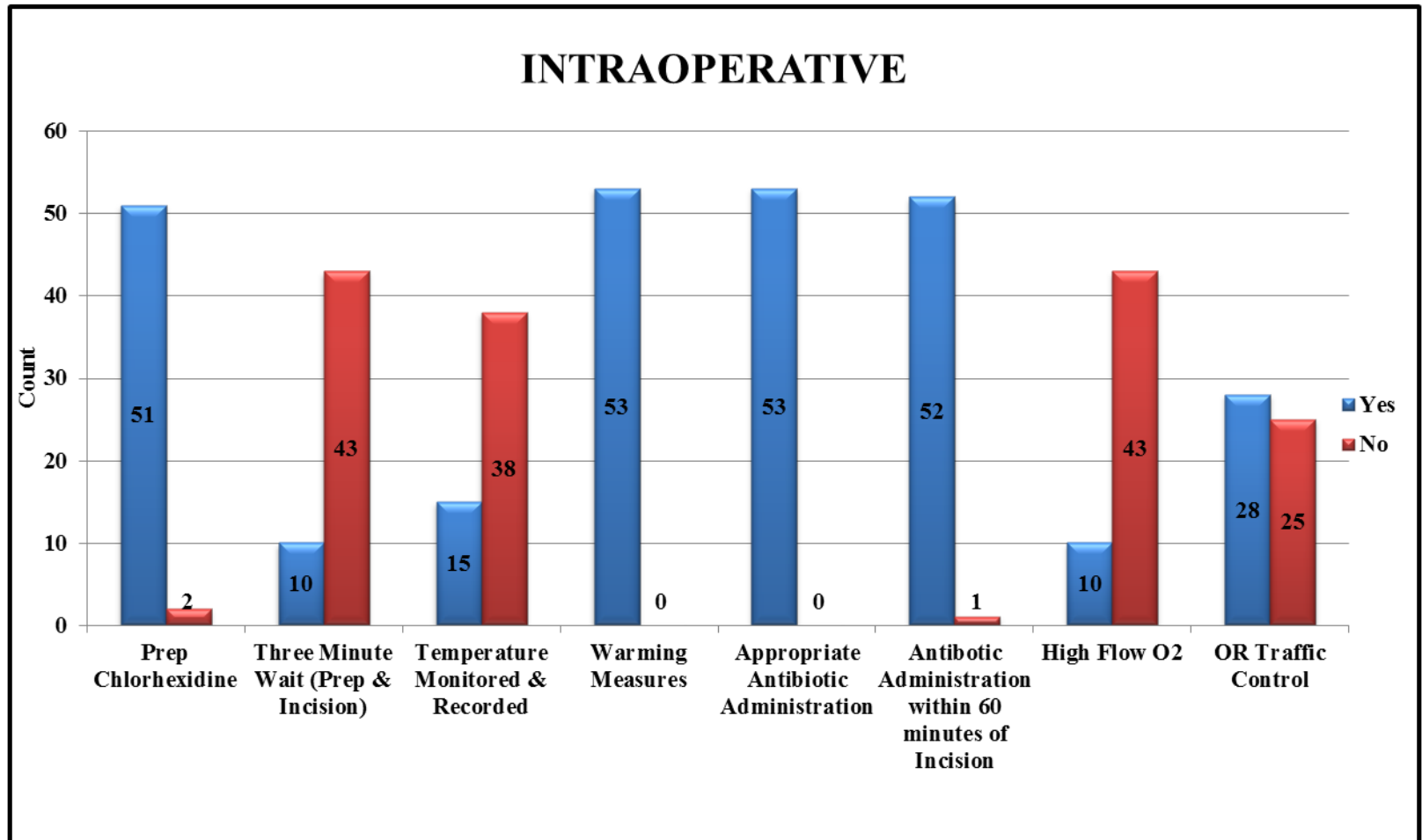
1. Lowest SaO2 in PACU _____ Average SaO2 in PACU _____ Supplemental Oxygen _____
2. Temp oral _____ skin _____ Bair hugger? _____
3. Accucheck if diabetic _____ Insulin given? _____ Accucheck after insulin _____



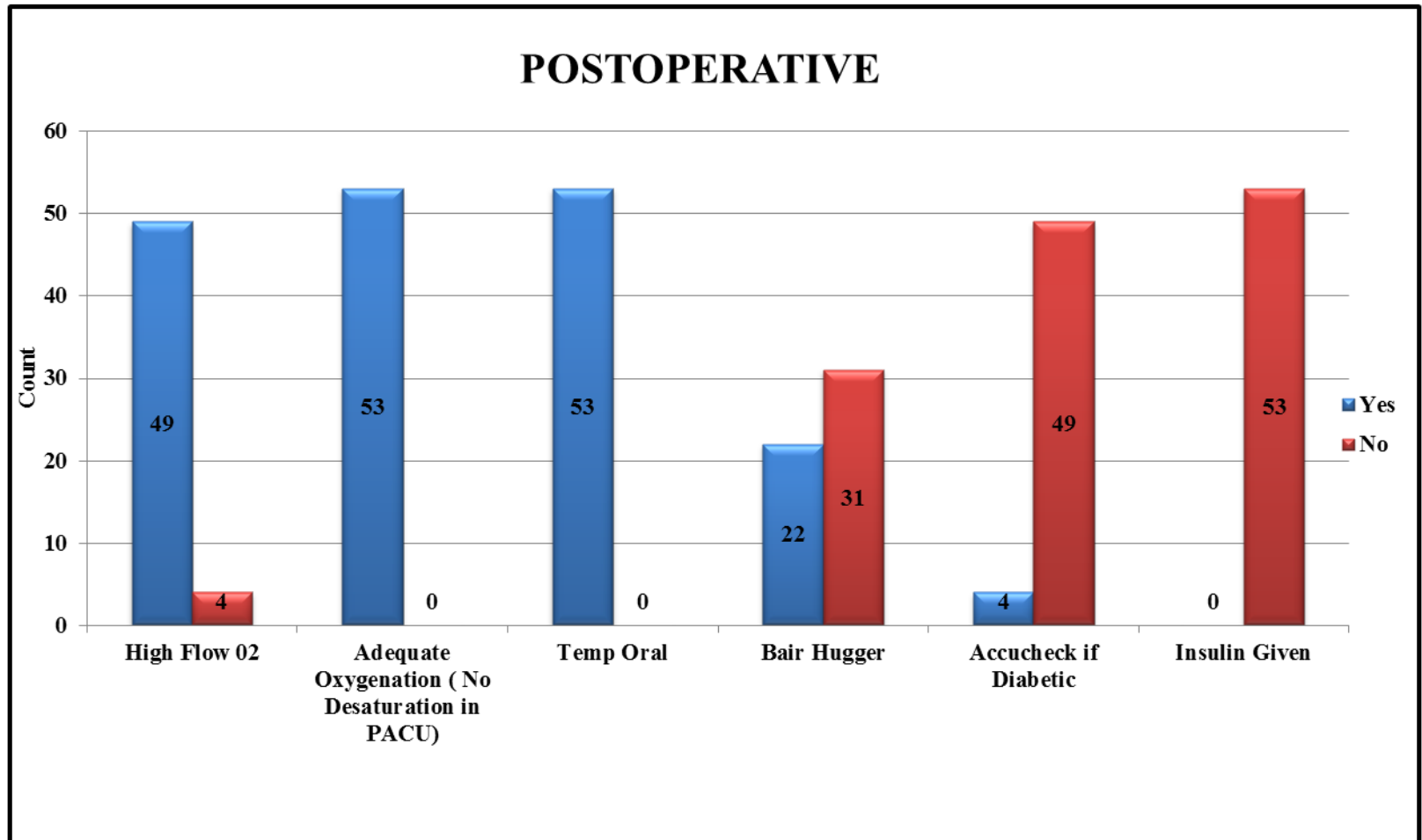
Pre-Interventions Data



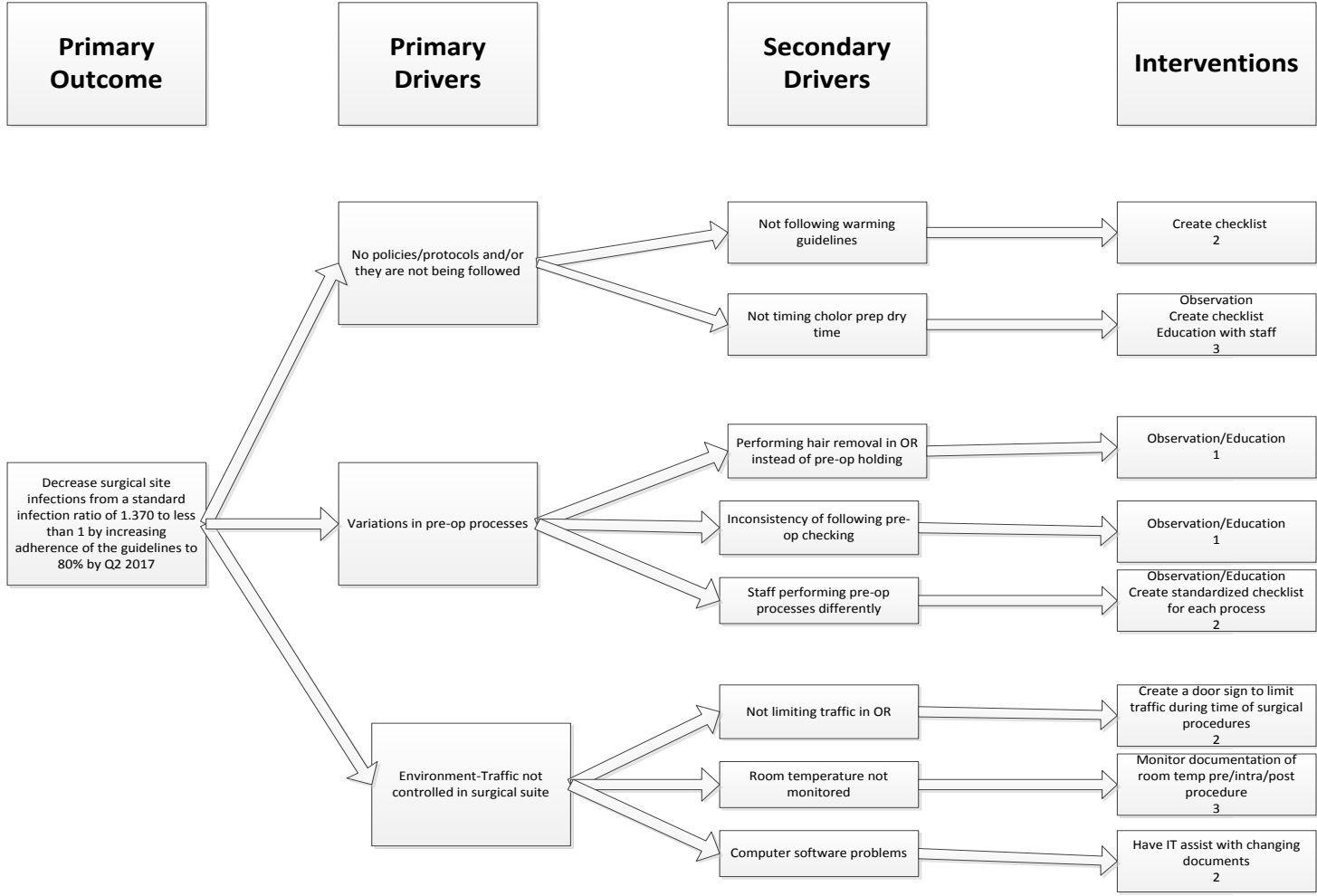
Pre-Interventions Data



Pre-Interventions Data



Driver Diagram



Interventions

Completed education and implemented interventions on 10/24/16

➤ OR Traffic: Sign on Door

- Keep OR doors closed during surgery expect as needed for passage of equipment, personnel and the patient

➤ Timing for Pre-Op Prep=3 Minutes

- Use appropriate antiseptic agent and technique for skin preparation



Interventions (contd.)

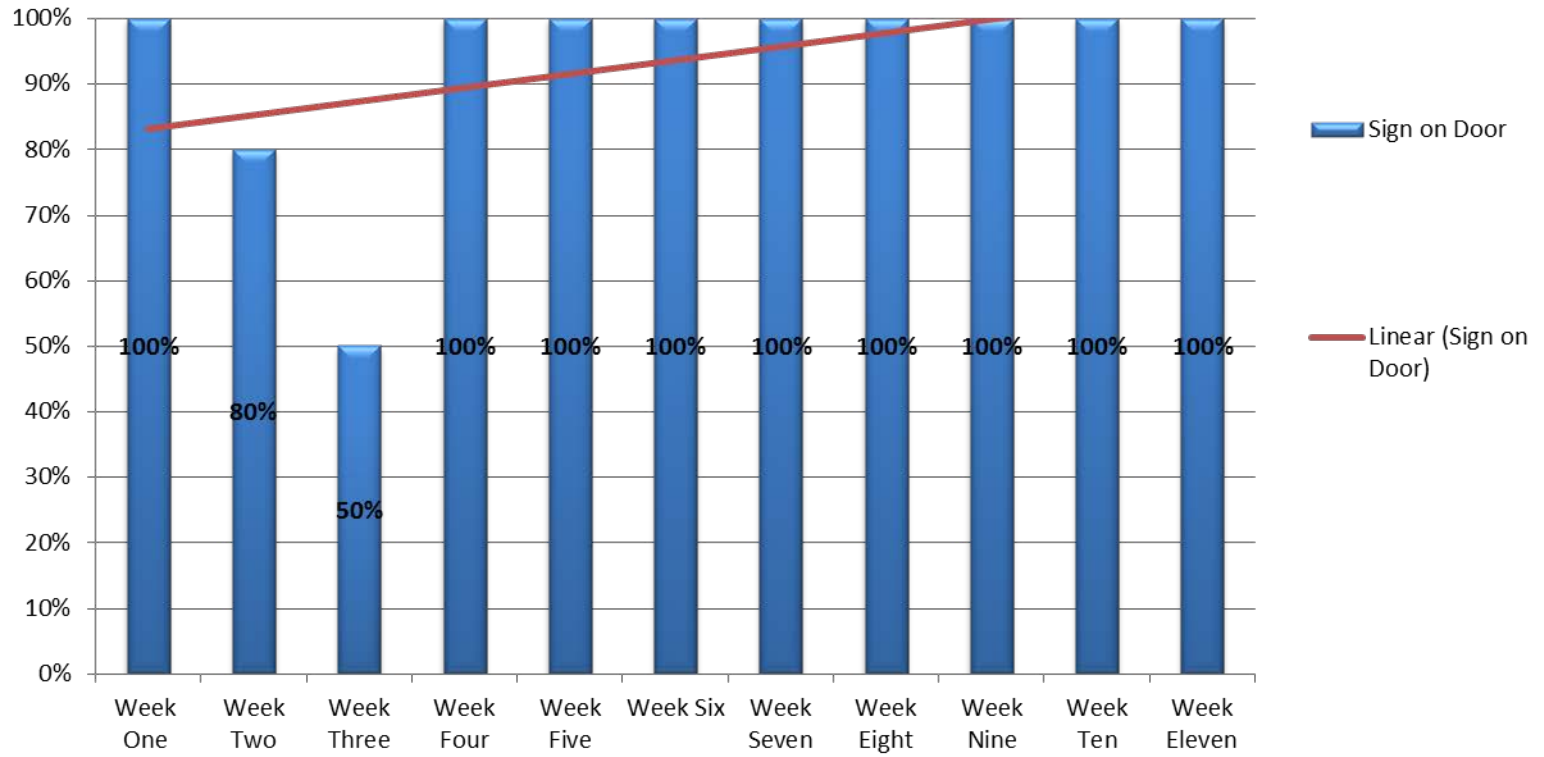
- Temp Monitored on Anesthesia Record
 - Maintain patient's core temperature at the recommended range for optimal wound healing and infection prevention
- New Bair Hugger Patient Gown*
 - Initiate preoperative warming interventions

*started 11/11/16



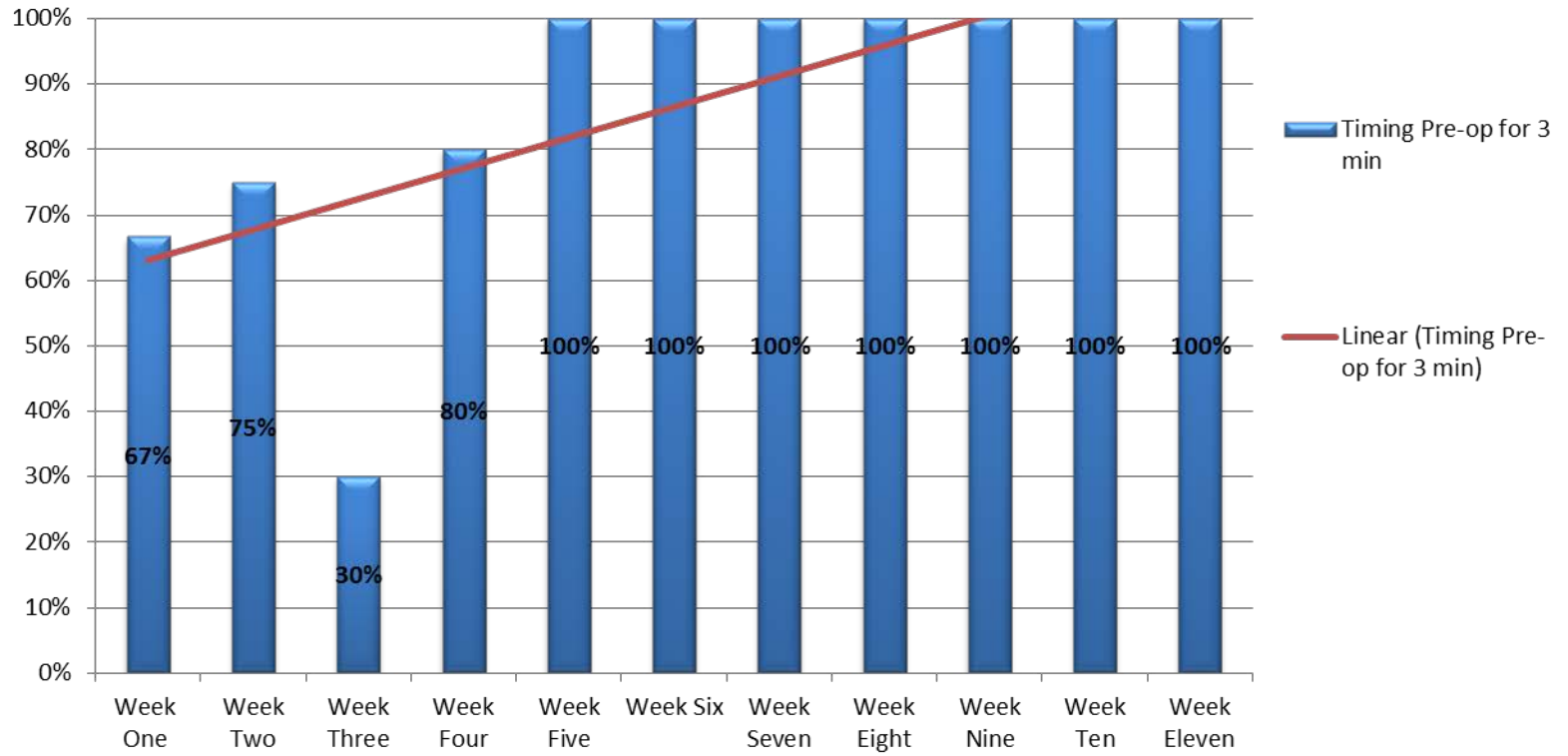
Post-Intervention Data

Sign on Door
(October 24th, 2016 - January 5th, 2017)



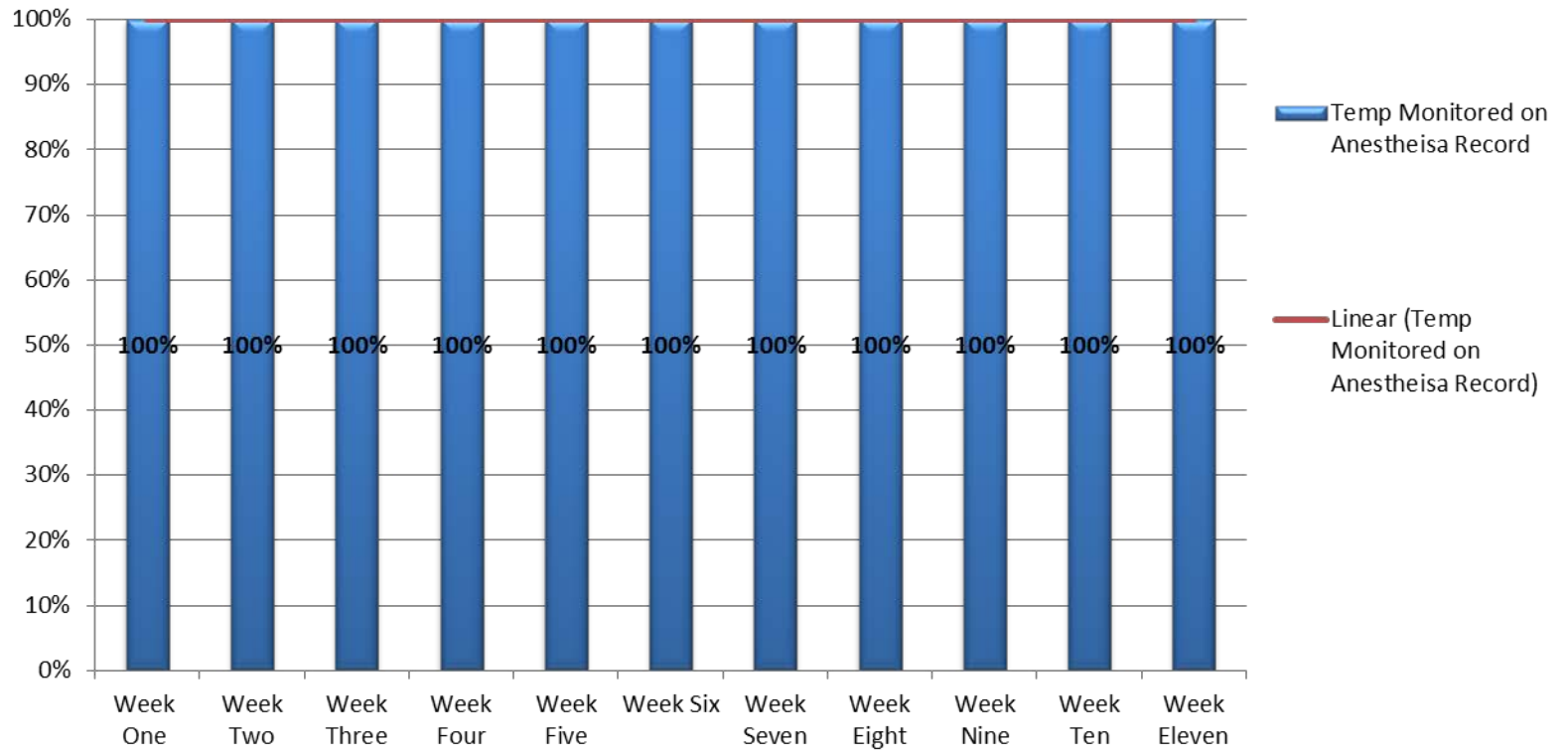
Post-Intervention Data

Timing Pre-op for 3 min
(October 24th, 2016 - January 5, 2017)



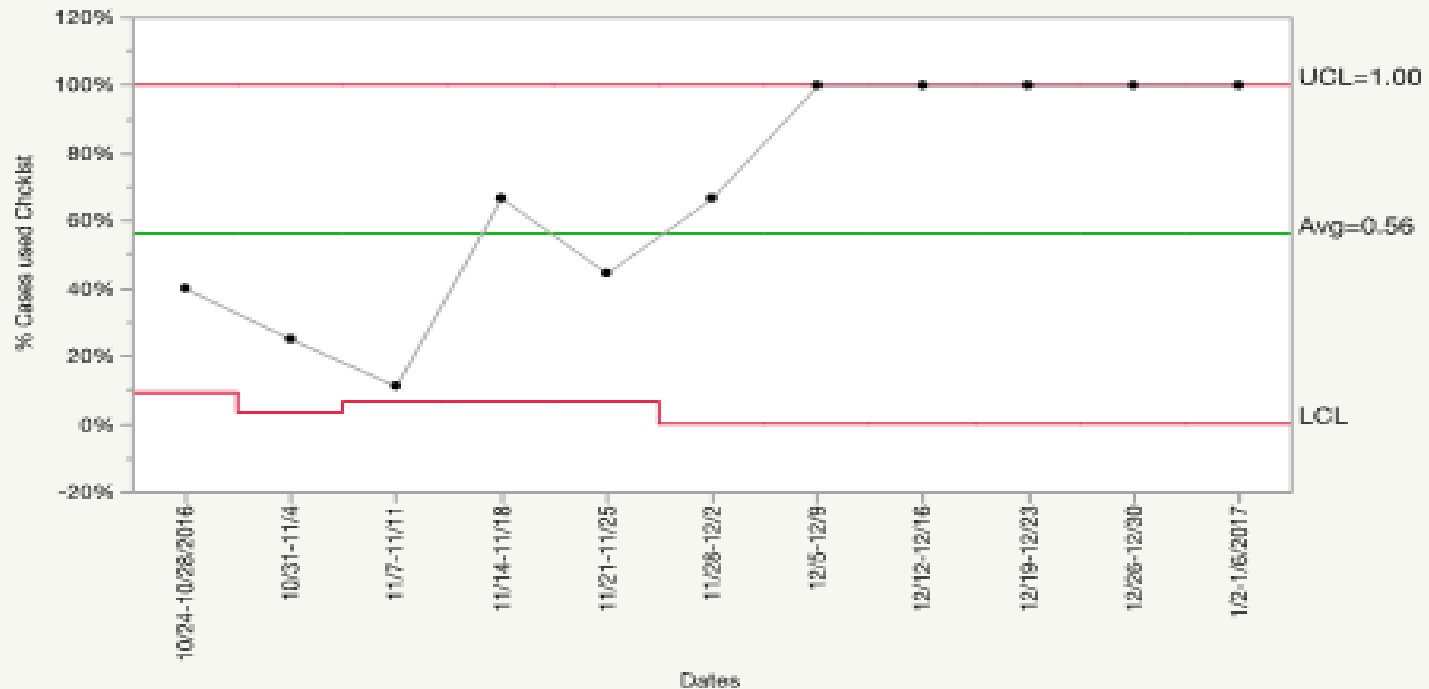
Post-Intervention Data

Temp Monitored on Anesthesia Record
(October 24th, 2016 - January 5th, 2017)



Compliance with Checklist

SPC p-Chart: % Cases used Chcklst



ROI

- SSI increases hospital los 7-14 days
 - Nearly $\frac{1}{4}$ colon surgery patients are readmitted within 3 months of discharge at a cost of roughly \$9,000 per readmission.
- Cost estimates vary around \$30,000 per SSI
 - Readmission rates are a major financial burden on the national health care system nationwide, these findings account for \$3 million dollars for colon rectal surgery.



Reference: Johns Hopkins Medicine (2016). Hospital Readmission after Colon Surgery Common, Costly and Preventable. Retrieved from www.hopkinsmedicine.org

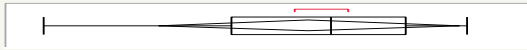
ROI Estimation

Annual SSI Colon	36
Percent Reduction	5.00%
Reduced Number of SSI	1.8
Direct Cost per Second Visit	\$10,729.19
Decrease Costs	\$19,313.00

ROI SSIs

Distributions Colon SSI (2015 & 2016 - outlier removed)

Sum(TOT DET CHG)



657
6

Lessons Learned



- Hair Removal
 - Do not remove hair at the operative site unless it will interfere with the operation
- Diabetic Patients
 - Lower diabetic population than expected



Sustainability



- Significant lag time (3 months) in the availability of SSI data
 - Will continue to monitor data and provide results at OR committee
 - Continue to use the data to guide and drive improvement decisions and additional initiatives
- A committed colorectal SSI champion to continue to lead project
- Colon surgeries will continue to be identified on the ORC board on DOS
- PCCs will monitor hand-off sheet compliance and report results to OR committee

Thank You for Your Attention

Comments

Feedback

Questions