Collaborative Approach to Improving Outcomes in Colorectal Surgery

Karen Anderson, MT, MPH, CIC
Manager, Infection Control & Prevention
California Pacific Medical Center
San Francisco, CA

andersk@sutterhealth.org

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Objectives & Background

- GOAL: Reduce adverse outcomes in colorectal surgeries
- Background
  - System approaches have been standardized: antibiotic choice, normothermia in OR, & glucose control
  - Do other variables exist that may influence outcomes in colorectal surgery, e.g., bowel prep, use of preoperative oral antibiotics, anastomotic technique, and wound closure?
    - Choices are based on custom, training, or the surgeon's judgment as to what is best for the individual patient.

Barriers & How we Resolved

- Getting surgeons to believe the rates – *this does not happen overnight!*
  - Use meticulously analyzed data
  - Get a surgeon champion – educate them and convince them to lead the improvement
- Collaborate: establish a local collaborative or join one and share data and results
  - identify variability in choices in colorectal surgery

Tests & What we Learned

- Surgical site infections (SSI) and complication rates were measured using NSQIP*.
- SSI rates were also measured using NHSN**
- Our rates were high
- Variability in some processes existed

*National Surgical Quality Improvement Project

**National Healthcare Safety Network

Measures – What & How

- Measured surgical site infection rates and other complications using NHSN & NSQIP
- Created questionnaire that surgeons complete for each surgery to identify 18 additional variables such as:
  - preoperative oral antibiotics in the 24hrs prior to surgery
  - non-emergent surgery
  - laparoscopic approach
  - mechanical bowel preparation
  - Entereg administration
- Analyzed variables for statistical significance

Operation and Surgeon controlled data on the questionnaire

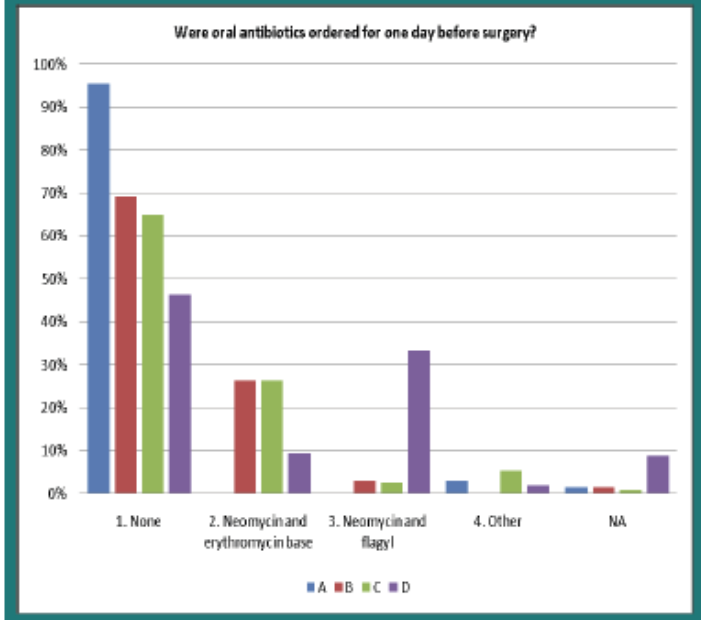
Variable	N	Cases	Rate	Missing data
Preop Oral Antibiotics	463	138	29.8%	19
Mechanical Bowel Prep	463	361	78.0%	19
Stapled Anastomosis	466	340	73.0%	16
Laparoscopic Operation	482	337	69.9%	0
No Anastomosis	482	274	56.9%	0
Entereg	472	132	28.0%	10
Diversion	460	40	8.7%	22
Immunomodulation	465	10	2.2%	17
Wound Protective Device	450	338	75.1%	32
Adequate Prep	373	251	67.3%	109
Fecal Spillage	454	34	7.5%	28
Lysis of Adhesion	463	135	29.2%	19
Splenic Flexure Mobilization	436	192	44.0%	46
Wound Closure	463	453	97.8%	19
Intra Abdominal Drain	464	50	10.8%	18

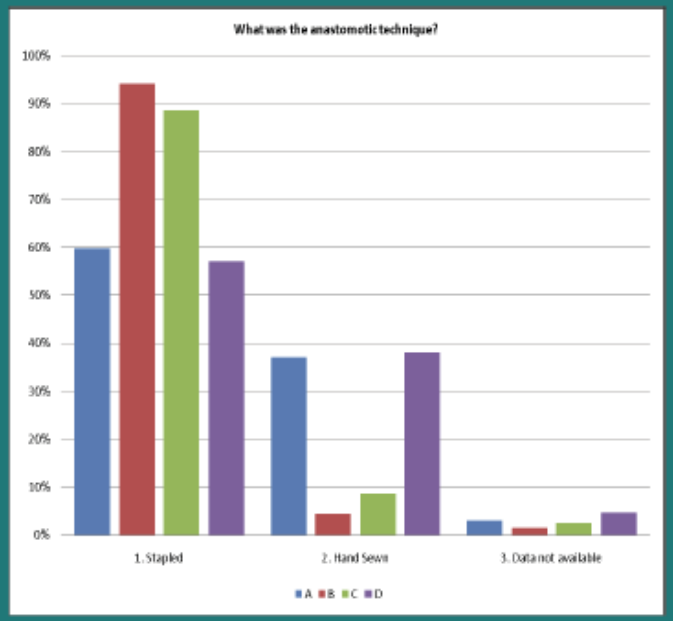
Five variables are associated with Anastomotic Leak and/or OS-SSI (p<0.05)

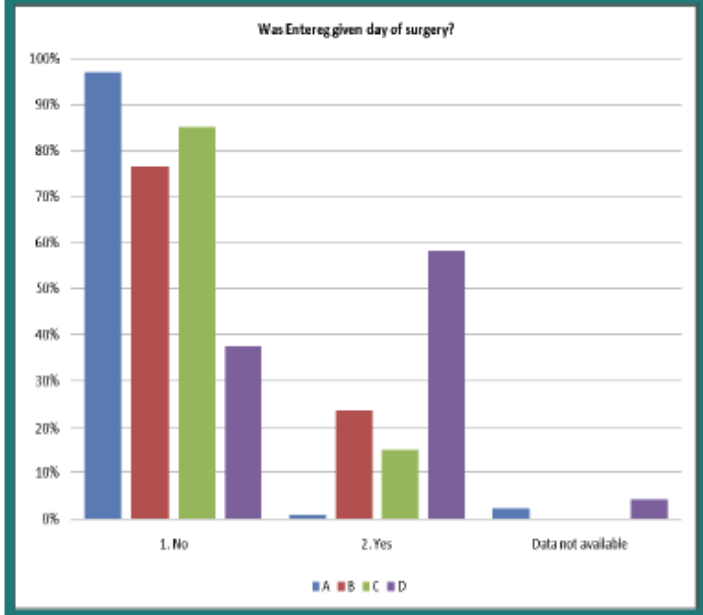
- The pre-operative use of oral antibiotics is the only surgeon controlled variable that is associated with a decreased anastomotic leak rate.

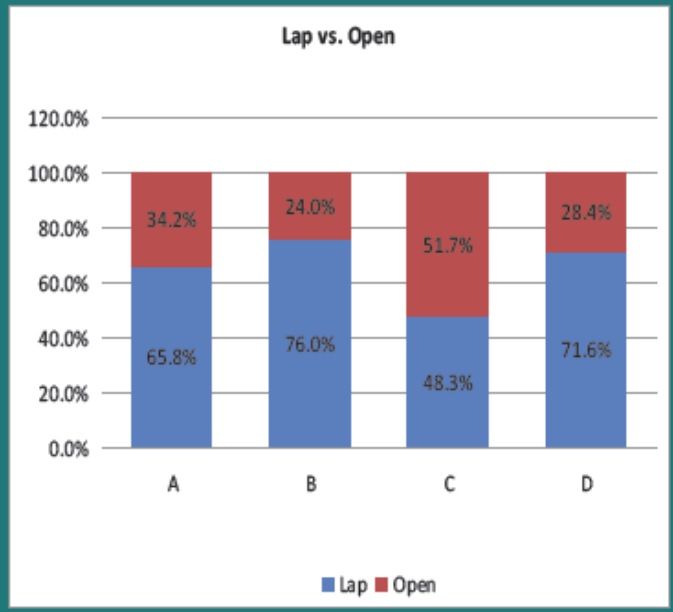
	Pearson correlation co-efficient	Correlation probability (p value)	Non-missing cases
Preop Oral Antibiotics	-0.097	0.036	96.1%
Diversion	0.096	0.039	95.4%
Site A	0.154	0.001	100.0%
Immunomodulation	0.093	0.045	96.5%
Lysis Of Adhesions	0.091	0.050	96.1%
Splenic Flexure Mobilization	0.130	0.006	90.5%

Figure 1: Practice Variation by Site









Wrap Up & Next Steps

- The collaboration of local hospitals has been successful
- Going forward:
  - Welcome additional collaborators
  - Increase our sample size
  - Continue to reduce missing data elements from questionnaires
  - Apply more sophisticated statistics (e.g., general and hierarchical linear modeling, Classification And Regression Trees +/- propensity scoring)

Advice for others

- Data must be accurate and convincing to elicit change
  - Know your data *backwards and forwards*
- Be able to succinctly give your message
- Get a surgeon on board who will be the spokesperson
- Get surgeons to agree on standardization, as much as possible
- Strength in numbers - collaborate with local hospitals (local influence has greater impact than national – *your own backyard concept*)