

Improving Patient Outcomes with a Robust Surgical Quality Program

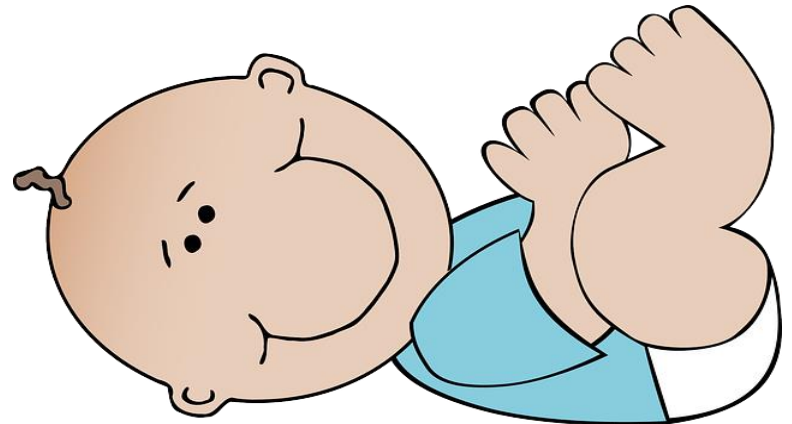


Quality Improvement Symposium
March 2, 2016

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Background

- ❖ Pediatric surgery program re-opened July 2010 after 3 ½ years of closure
- ❖ Stepwise programmatic growth
 - ❖ Extensive staff training, especially bedside nursing
 - ❖ Standardization of practice
 - ❖ Growth, addition of more complicated services
 - ❖ **Assessment of quality**



Background

- ❖ UHC – administrative data, retrospective & limited for pediatric surgery
 - ❖ Relevant metrics mixed with adult surgery and pediatrics
 - ❖ Percent in each too small to evaluate quality
- ❖ Prospective databases relevant to pediatric surgery
 - ❖ Children’s Hospital Association – not in use – \$\$\$\$
 - ❖ P-NSQIP – Adult surgery and trauma already using – \$\$
 - ❖ Pediatric general surgery modules started in 2011 and pediatric trauma 2014
- ❖ Funding approved via Board and CMN
 - ❖ Began October 2014



American College of Surgeons National Surgical Quality Improvement Program

- ❖ Data-driven, risk-adjusted, outcomes-based program
- ❖ Uses clinical data, not administrative data
- ❖ Assesses 126+ variables
- ❖ Outcomes assessed 30 days after index surgery
- ❖ Standardized and validated data definitions

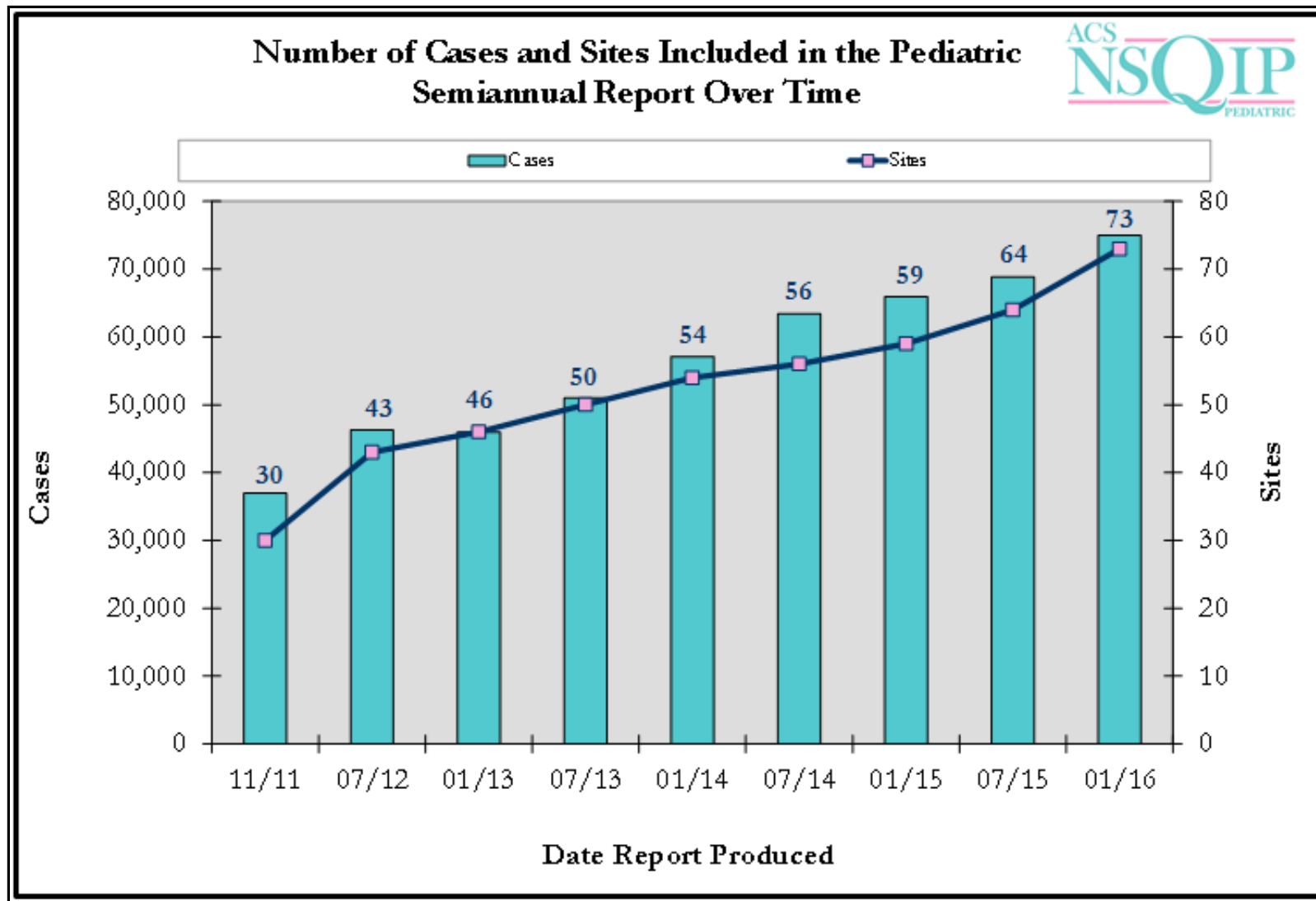


NSQIP QUALITY IMPROVEMENT PROCESS

- ❖ Train a multidisciplinary team
 - ❖ SCR – trained and certified data collector
 - ❖ Surgical Champion
- ❖ Hospitals abstract data.
- ❖ Analyzed by ACS NSQIP, risk stratified.
- ❖ Reported with ranking every 6 months.
- ❖ Hospitals act on their data.



NSQIP Participating Hospitals



DATA REPORTS

- ❖ Models for all surgery types:

- ❖ *Mortality*
- ❖ *Morbidity*
- ❖ *SSI*
- ❖ *Vein Thrombosis*
- ❖ *Reintubation*
- ❖ *Cardiac*
- ❖ *Pneumonia*
- ❖ *UTI*

- ❖ Models for subspecialties

- ❖ *General surgery*
- ❖ *Orthopedic*
- ❖ *Otolaryngology (ENT),*
- ❖ *Plastic*
- ❖ *Urology*
- ❖ *Neurosurgery*

Appendectomy Baseline Data October 2014-May 2016

	Vidant Pre Protocol		All Cases: Comparison	
Number of Cases	46		4,328	
Post-op Occurrence Rate	15.2%		4.2%	
I. Outcome				
Readmission for any reason within 30 days?	17.4%		4.0%	
Unplanned return to OR, within 30 days?	4.3%		1.2%	
Median Hospital LOS, Days (IQR)	1.5	1	1	2
Avg Duration of Operation, Minutes	52	±23.4	46	±33.1
II. Cases With Post-Op Occurrences				
Cases with 0 Occurrences	39	84.8%	4,146	95.8%
Cases with 1 Occurrence	5	10.9%	166	3.8%
Cases with 2 Occurrences	2	4.3%	16	0.4%
Mean # of Occurrences [3]	1.3	±0.5	1.1	±0.3
Cases With Wound Occurrences				
Superficial Incisional SSI	0	0.0%	39	0.9%
Deep Incisional SSI	0	0.0%	4	0.1%
Organ/Space SSI	6	13.0%	115	2.7%
Wound Disruption	0	0.0%	0	0.0%

Higher complication rates and readmission rates, largely due to intra-abdominal abscesses.

Appendicitis Protocol

Literature Review, Interdisciplinary Team
Consensus

Standardization of

- ❖ Evaluation
 - ❖ Labs
 - ❖ Imaging
- ❖ Operative Procedure
- ❖ Antibiotics
 - ❖ Type
 - ❖ Duration
- ❖ Discharge Criteria



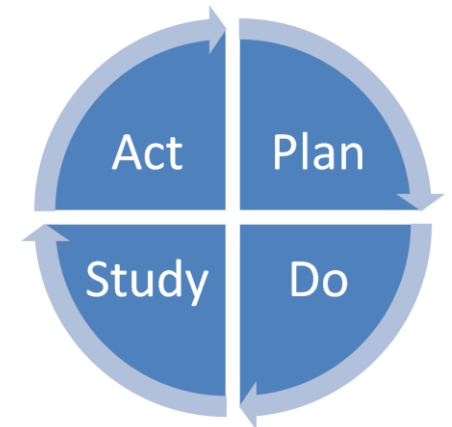
Post Protocol Data

	Vidant Pre Protocol		Vidant Post Protocol		All Cases: Comparison		
Number of Cases	46		51		4,806		
Post-op Occurrence Rate		15.2%		11.8%		5.0%	Improved, still outlier
I. Outcome							
Readmission for any reason within 30 days?		17.4%		7.8%		3.7%	Improved, still outlier
Unplanned return to OR, within 30 days?		4.3%		0.0%		0.9%	Improved, meet standard
Median Hospital LOS, Days (IQR)	1.5	1	1	1	1	2	Improved, meet standard
Avg Duration of Operation, Minutes	52	±23.4	52	±16.5	46	±30.3	
II. Cases With Post-Op Occurrences							
Cases with 0 Occurrences	39	84.8%	45	88.2%	4,568	95.0%	
Cases with 1 Occurrence	5	10.9%	5	9.8%	211	4.4%	Improved, still outlier
Cases with 2 Occurrences	2	4.3%	1	2.0%	27	0.6%	Improved, still outlier
Mean # of Occurrences [3]	1.3	±0.5	1.2	±0.4	1.1	±0.3	Improved, meet standard
Cases With Wound Occurrences							
Superficial Incisional SSI	0	0.0%	2	3.9%	47	1.0%	Worse, but low N
Deep Incisional SSI	0	0.0%	0	0.0%	11	0.2%	
Organ/Space SSI	6	13.0%	4	7.8%	138	2.9%	Improved, still outlier

Decreased complications, readmissions, abscess rate.
Still more to do....

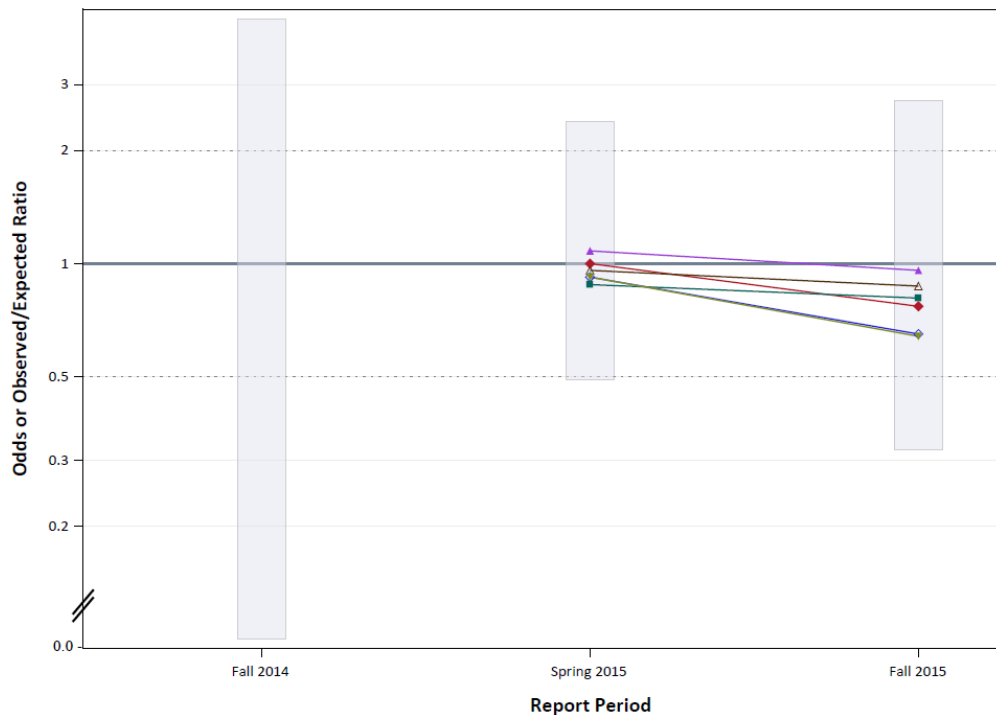
Appendicitis Next Steps

- Individual case reviews
 - We are more likely to operate on perforated appendicitis, rather than manage with antibiotics non-operatively.
 - We are imaging for a post op abscess earlier. Others recommend no imaging before POD 7.
 - Revision of protocol.



P-TQIP Data - Mortality

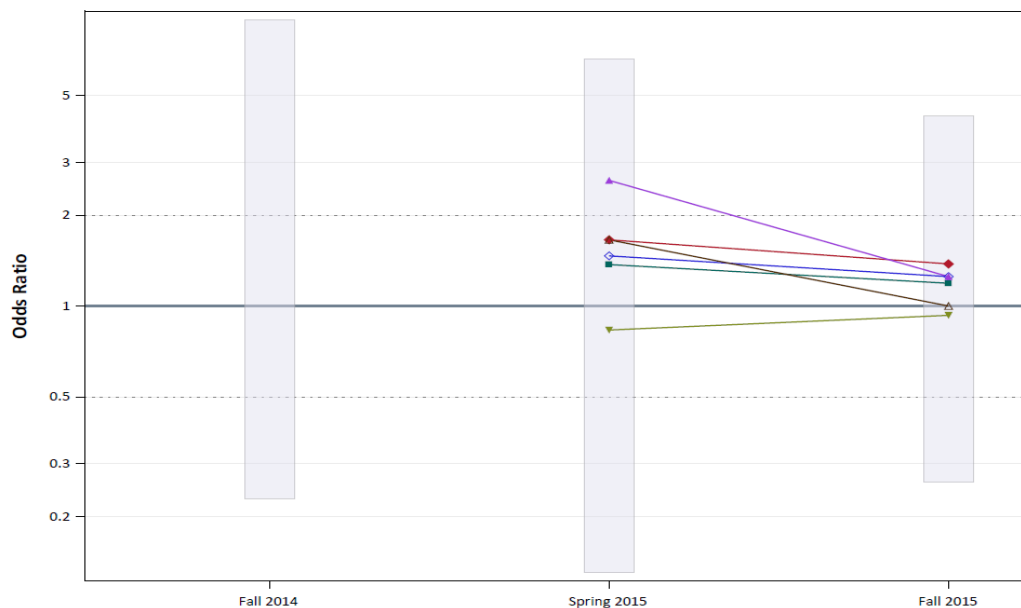
Risk Adjusted Mortality								
	Fall 2014 Report				Fall 2015 Report			
	Cohort N	Observed %	Predicted %	Decile	Cohort N	Observed %	Predicted %	Decile
All	558	1.6	1.6	6	575	1.6	1.8	2
Ages 0-13	329	1.8	1.7	7	359	1.6	1.7	3
Ages 14-18	229	1.3	1.4	4	216	1.9	2.2	2
TBI	33	24.2	22.3	7	37	21.6	27.7	1
TBI Age 0-13	18	27.8	22	9	22	22.7	25.6	3
TBI Age 14-18	15	20	20.8	4	15	20	24.6	2



- Pediatric Surgery assumed care of trauma patients <15 each AM.
- Hiring of a dedicated pediatric neurosurgeon.
- Marked decrease in mortality, especially in TBI age 0-13.

P-TQIP Data - Complications

Risk Adjusted Complications								
	Fall 2014 Report				Fall 2015 Report			
	Cohort N	Observed %	Predicted %	Decile	Cohort N	Observed %	Predicted %	Decile
All	558	2.4	2.2	8	575	2.3	2.2	7
Ages 0-13	329	1.8	1.6	9	359	1.7	1.5	7
Ages 14-18	229	3.1	2.8	7	216	3.3	3.1	7
TBI	33	25.9	23.4	9	37	17.2	17.2	5
TBI Age 0-13	18	26.7	20	9	22	17.6	15	7
TBI Age 14-18	15	25	24.9	6	16.7	19.5	24.6	4



- Decreased complication rates, especially in TBI.
- Still room for decreasing complications further.
- Identify areas of opportunity.

Complication Drill Down

- Majority of complications pneumonia in PICU patients, especially with TBI.
- Markedly higher ICU LOS
 - Related to longer duration of ventilation
 - Related to deeper/longer sedation
- Collaborate with Dr. LeDoux – PICU
 - Revision of sedation protocols
 - Twice a day evaluate for extubation
 - Creation of non-ICU status in ICU

P-TQIP Data - Pneumonia

Risk Adjusted Pneumonia								
	Fall 2014 Report				Fall 2015 Report			
	Cohort N	Observed %	Predicted %	Decile	Cohort N	Observed %	Predicted %	Decile
TBI	27	22.2	19.1	8	29	10.3	10	6
TBI Age 0-13	15	20	12.9	9	17	5.9	5.4	6
TBI Age 14-18	12	25	22.2	8	12	16.7	13.2	8



- Marked decrease in pneumonias by all centers.
- We improved faster than most centers.

P-TQUIP Data – ICU Utilization

Resource Utilization TBI				
Cohort	Group	Median Duration of Ventillation	Median ICU LOS	Median LOS
All	All Hospitals	3	5	9
	Vidant 2014	6	11	11
	Vidant 2015	3.5	5	8
Ages 0-13	All Hospitals	3	5	9
	Vidant 2014	5.5	11	11
	Vidant 2015	4	5	8
Ages 14-18	All Hospitals	4	6	10
	Vidant 2014	8	11	11
	Vidant 2015	3	6.5	9

- Decrease Duration of Ventilation
2.5 days
- Decrease ICU LOS
6 days
- Decrease Total LOS
3 days

Really rough savings for just decreased LOS in PICU

\$666,000

By DRG, age <18, with assumptions that LOS transitioned to floor, PICU day cost \$6000
Decreased LOS ICU – Decreased Total LOS = 3 days, multiplied by 37 patients

Lessons Learned in QI Process

- When people trust the data, they are more willing to make a change.
- A team with each member focused on their area of expertise can accomplish more, faster.



Collaborative Team Members

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NSQIP Surgical Case Reviewer

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Melinda Edwards, MBA – Trauma Registrar

Matt LeDoux, MD – PICU Director

