216: A Wound Prevalence Observational Study for the Prevention of Surgical Site Infections

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ABSTRACT

Background: In June, 2014 an acute care hospital system conducted a Wound Closure Point Prevalence program to prevent post-op surgical site infection (SSI) The program monitored compliance with the Joint Commission NPSG 07.05.01. The prevalence program evaluated the adoption of antibacterial sutures (AS) and topical skin adhesives (TSA) as part of a corporate 7S bundle that was implemented in 2012 to reduce SSI. 10 hospitals participated out of the 25 hospitals in the system.

Method: The team consisted of trained nurse clinical specialists with operating room experience. Individual surgeons were in-serviced on the proper use of AS and TSA products. Observations also included some in L&D and ambulatory surgery. Other factors in wound closure observed were the use of staples, non-absorbable sutures, steri-strips, surgical drains and post-op dressing material. In addition, a lecture on the prevention of surgical site infections was presented to the surgical staff and administration to enlist commitment to teamwork in the reduction of SSIs.

Results: A total of 330 wound closure observations across 162 surgical procedures were observed. Surgical staple usage was highest among OB/GYN and Orth. Topical skin adhesive (TSA) usage had a wide variation in application techniques, applying more layers than required. Topical skin adhesive was often covered with unnecessary dressings. Evaluation of hip, knee, colon and hysterectomy rates in 2015 showed a 37.5% reduction in the participating hospitals through April 2015.

Conclusion: A direct observation program provided in-service on proper suture and closure technique. Reduction in excess TSA and dressings was observed as a result of individual training with surgeons, physician assistants and residents. Results also revealed a high inappropriate use of surgical drains and a need for drain site protocols. Hospitals established SSI teams to continue to work in implementing the corporate 7S Bundle program to reduce SSIs. (www.7sbundle.com).

PROGRAM OBJECTIVE

Evaluate adoption of wound closure technologies that are a part of UHS's 7S Bundle

- Identify risk factors for surgical site infection that can be addressed during wound closure

INNOVATIVE APPROACH

Risk assessments to identify gaps in policies
Staff training to reduce variation in practices
Patient education to engage patients in care

BROAD IMPACT

For patients…
Protect against known risks for infection

FOR UHS…

Standardize practices across facilities

Ensure appropriate utilization of devices

Demonstrate "Elements of Performance" for Joint Commission's NPSGs

METHODS:

Ten (10) facilities were selected for the wound prevalence study based on their standardized infection ratio for surgical site infections. Any facility with a SIR >1 were requested to participate in the observational study in the operating room to evaluate closure technique, the use of staples, drains, incisional adhesive and antimicrobial sutures. Experienced OR Clinical Specialists conducted onsite observations and collected information. They also provided in-service education to surgeons and other surgical staff. The observations occurred over 2-3 days in the 10 facilities.

Section 1a -- Wound closure device utilization by incision size

Incision size	# of incisions observed	Absorbable	Absorbable (non-antibacterial)	Non-absorbable Sutures	Topical Skin Adhesive	Skin Staples	Dry wound dressing applied?
0-4 cm	223	78%	18%	4%	63%	10%	27%
5-9 cm	44	75%	14%	11%	55%	16%	66%
10-14 cm	22	68%	15%	17%	23%	36%	73%
15+ cm	41	74%	15%	11%	49%	27%	80%
TOTALS	**330**	**74%**	**16%**	**10%**	**57%**	**15%**	**42%**

Section 1b -- Wound closure device utilization by incision location

Insition location	# of incisions observed	Absorbable	Absorbable (non-antibacterial)	Non-absorbable Sutures	Topical Skin Adhesive	Skin Staples	Dry wound dressing applied?
Abdomen	217	69%	22%	9%	63%	10%	32%
arm	2	100%				100%	100%
back (lower)	10	83%		17%	30%	40%	70%
back (upper)	1	50%		50%			100%
chest/breast	28	64%	21%	14%	64%	4%	71%
face	3	60%		40%			67%
foot	1			100%			100%
groin/pelvis	14	95%	2%	3%	43%	7%	57%
head	2			100%		50%	50%
hip	3	69%	31%		33%	33%	100%
knee	10	67%	13%	19%	40%	50%	100%
leg (lower)	6	100%			100%		33%
leg (upper)	2	100%			100%		50%
Neck	3	89%		11%	67%		67%
shoulder	3	100%					0%
umbilicus	18	81%	19%		56%		17%
TOTALS	**330**	**74%**	**16%**	**10%**	**57%**	**15%**	**42%**

Section 1c -- Wound closure device utilization by surgical specialty

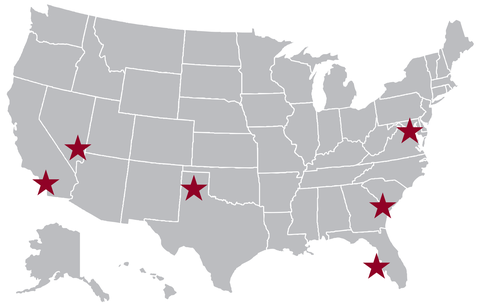
Surgical Specialty	# of incisions observed	Absorbable	Absorbable (non-antibacterial)	Non-absorbable Sutures	Topical Skin Adhesive	Skin Staples	Dry wound dressing applied?
Cardiac	10	93%	2%	5%	90%	10%	40%
General	166	75%	15%	10%	59%	10%	33%
Neuro	7	83%		17%	14%	14%	57%
OB/GYN	79	78%	20%	2%	54%	25%	46%
Oncology	3	67%		33%	33%		100%
Ortho	27	71%	14%	15%	30%	37%	81%
Plastic	13	49%	29%	22%	54%		92%
Urology	18	92%	5%	3%	89%		11%
Vascular	7	100%			86%	14%	29%
TOTALS	**330**	**74%**	**16%**	**10%**	**57%**	**15%**	**42%**

Wound closure device utilization by facility

# of incisions observed	Absorbable (antibacterial) Sutures	Absorbable (non-antibacterial)	Non-absorbable Sutures	Topical Skin Adhesive	Skin	Dry wound dressing applied?
45	86%	5%	9%	56%	11%	27%
29	90%	8%	2%	66%	3%	41%
19	73%		27%	21%	37%	74%
29	91%	5%	5%	79%	17%	38%
48	65%	33%	2%	67%	15%	40%
42	53%	31%	16%	60%	5%	40%
13	84%	5%	11%	54%	8%	15%
31	49%	42%	10%	58%	13%	32%
39	86%	7%	8%	77%	5%	44%
35	96%		4%	17%	43%	71%
330	**74%**	**16%**	**10%**	**57%**	**15%**	**42%**

NOTES:

- *Generally, high availability of antibacterial sutures in hospital ORs*
- *Surgical staple usage highest among OB/GYN and Ortho*
- *Many surgeons and staff were not aware that they were using antibacterial sutures, nor were they familiar with the clinical evidence supporting the use of this technology* (*Note: lack of awareness observed prior to education events)*
- *Some non-absorbable sutures (e.g. nylon, silk) were used for wound closure and drain securement*



Topical skin adhesive application by facility

#of incisions observed	Hemostasis achieved?	Skin dry?	Wound in horizontal position?	Wound edges	Correct # of adhesive layers applied?	Dry wound dressing applied?
25	100%	100%	96%	100%	52%	16%
19	100%	100%	100%	100%	63%	32%
4	100%	100%	100%	100%	100%	50%
23	100%	100%	100%	100%	70%	26%
32	100%	53%	97%	100%	100%	28%
25	100%	100%	100%	100%	86%	28%
7	100%	100%	100%	100%	100%	0%
18	100%	100%	89%	100%	56%	0%
30	100%	100%	100%	100%	50%	33%
6	100%	100%	100%	100%	100%	33%
189	**100%**	**92%**	**98%**	**100%**	**72%**	**24%**

NOTES:

- *Topical skin adhesive usage seen in a variety of incision sizes and locations*
- *Wide variation in application techniques*
- *Clinicians often applied more layers of topical skin adhesive than required by IFU*
- *Opportunity to use topical skin adhesives to add strength and protection to medium and large incisions, especially where staples are currently being used*
- *Topical skin adhesive covered with many types of wound dressings*

Section 3a -- Surgical drain observations by incision size

Incision size	# of drains observed	BIOPATCH® Disk used	Placed printed side up	360 skin contact
0-4 cm	9	0%	0%	0%
5-9 cm	8	0%	0%	0%
10-14 cm	5	0%	0%	0%
15+ cm	21	29%	29%	5%
TOTALS	**43**	**14%**	**14%**	**2%**

Section 3b -- Surgical drain observations by incision location

Incision location	# of drains observed	BIOPATCH® Disk used	Placed printed side up	360 skin contact
Abdomen	13	15%	15%	8%
back (lower)	4	0%	0%	0%
back (upper)	1	0%	0%	0%
chest/ breast	13	31%	31%	0%
face	1	0%	0%	0%
groin/pelvis	1	0%	0%	0%
head	1	0%	0%	0%
knee	4	0%	0%	0%
leg (lower)	4	0%	0%	0%
Neck	1	0%	0%	0%
TOTALS	**43**	**14%**	**14%**	**2%**

Section 3c -- Surgical drain observations by surgical specialty

Surgical Specialty	# of drains observed	BIOPATCH® Disk used	Placed printed side up	360 skin contact
Cardiac	7	0%	0%	0%
General	15	13%	13%	0%
Neuro	3	0%	0%	0%
Oncology	1	0%	0%	0%
Ortho	8	0%	0%	0%
Plastic	9	44%	44%	11%
TOTALS	**43**	**14%**	**14%**	**2%**

NOTES:

- *Surgical drain placement observed across several surgical procedures*
- *Surgical drain sites were rarely protected with an antimicrobial CHG device*
- *Opportunity to protect all surgical drain sites from extralumnial bacterial contamination*
- *OR staff noted that central lines placed in OR typically are protected on nursing floor*

SSI	*Count*	*Expected*	*UHS SIR*	*National SIR*
Abd Hysterectomy	13	20	0.67	0.83
Colon	41	63	0.65	0.98
CABG	6	16	0.39	0.55

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