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Preventing Surgical Site
Infections:
The SSI Bundle



Why SSI?

New York State 30,000 hospital discharges 1984

- 3.7% of patients experience serious adverse events related to medical management
- The top three causes were:
 - Medication-related (19%)
 - **Wound infections (14%)**
 - Technical complications (13%)
- All of these events led to disability or prolonged stay; death occurred in 13.6% of these patients
- 58% of these events were preventable

Opportunity to Prevent Surgical Infections

- An estimated 40-60% of SSIs are preventable:
 - Appropriate timing, selection, and duration of prophylactic antibiotics (occurs in as few as 25-50% of operations)
 - Appropriate Hair Removal
 - Post-operative glucose control (major cardiac surgery patients)*
 - Post- operative normothermia (colorectal surgery patients)*



* These components of care are supported by clinical trials and experimental evidence in the specified populations; they may prove valuable for other surgical patients as well.

Impact of SSI

	Infected	Uninfected
Mortality (in-hospital)	7.8%	3.5%
ICU admission	29%	18%
Readmission	41%	7%
Median initial LOS	11d	6d
Median total L.O.S.	18d	7d

Kirkland. *Infect Control Hosp Epidemiol.* 1999;20:725.

Prospective, case-controlled study of 22,742 patients undergoing inpatient surgical procedures between 1991- 1995.

SSI bundle

1. **Appropriate use of antibiotics**
2. Appropriate hair removal
3. Post-operative glucose control (major cardiac surgery patients)*
4. Post-operative normothermia (colorectal surgery patients)*

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Use of Antibiotics

Appropriate use of prophylactic antibiotics

- Selection
- Timely administration
- Timely discontinuation of prophylaxis

Timing of Antibiotics

- Most studies indicate that optimum timing for prophylactic antibiotic is within one hour of incision time.
- Up to 2 hours if drug requires a longer infusion time

Steps to Prevent SSI

1. Appropriate use of antibiotics
2. Appropriate hair removal
3. Post-operative glucose control (major cardiac surgery patients)*
4. Post-operative normothermia (colorectal surgery patients)*

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Hair Removal

- Appropriate:
 - No hair removal at all
 - Clipping
 - Depilatory use
- Inappropriate:
 - Razors

Influence of Shaving on SSI

<u>Group</u>	<u>No Hair Removal</u>	<u>Depilatory</u>	<u>Shaved</u>
•Number	155	153	246
•Infection rate	0.6%	0.6%	5.6%

Seropian. *Am J Surg.* 1971; 121: 251.

Razor Use vs. Clipper Use Cardiac Surgery

	<u>Number</u>	<u>Infected (%)</u>
Shaved	990	13 (1.3%)
Clipped	990	4 (0.4%)

$p < 0.03$

Ko. *Ann Thorac Surg.* 1992;53:301.



Steps to Prevent SSI

1. Appropriate use of antibiotics
2. Appropriate hair removal
3. Post-operative glucose control (major cardiac surgery patients cared for in an ICU)*
4. Peri and post-operative normothermia (colorectal surgery patients)*

* These components of care are supported by clinical trials and experimental evidence in the specified populations; they may prove valuable for other surgical patients as well.

Steps to Prevent SSI

1. Appropriate use of antibiotics
2. Appropriate hair removal
3. Post- operative glucose control (major cardiac surgery patients cared for in an ICU)*
4. Peri and post operative normothermia (patients with colorectal surgery)*

* These components of care are supported by clinical trials and experimental evidence in the specified populations; they may prove valuable for other surgical patients as well.



Peri and post operative operative Normothermia

- Hypothermia reduces tissue oxygen tension by vasoconstriction.
- Hypothermia reduces leukocyte superoxide production.
- Hypothermia increases bleeding and transfusion requirements.
- Hypothermia increases duration of hospital stay even in uninfected patients.

Measures

- Surgical patients with appropriate hair removal
- Appropriate selection of prophylactic antibiotics
- Timely prophylactic antibiotic administration
- Timely prophylactic antibiotic discontinuation
- Major cardiac surgery patients with controlled post-operative glucose
- Colorectal surgery patients with normothermia
- Measuring Surgical Infection Rate