Prevention of Surgical Site Infections

National Patient Safety Goal 07.05.01

2012

Patient Risk Factors

- Diabetes
- Nicotine use
- Altered immune status, such as steroid use or chemo
- Malnutrition
- Prolonged preoperative hospital stay
- Obesity
- Infection present at site remote to incision
- Preoperative nares colonization with *Staphylococcus aureus*

Surgical Care Improvement Project (SCIP) measures

Antibiotic Prophylaxis:

- Use correct antibiotic
- Administer within one hour of incision (2 hrs if vancomycin is used)
- Redose if lengthy procedure
- Stop antibiotics within 24 hrs (48 hrs for cardiac surgery)

Prevention (SCIP measures) cont'd

- Limit hair removal to essential area only
- Use depilatory or clippers
- NO razors!
- Keep the patient warm (except open heart patients) at >96.8º F
- Blood glucose controlled (<200)

Risk Stratification

- ASA (American Society of Anesthesiology) score – given by anesthesia to reflect the patient's health at the time of surgery. This is a scale of 1 to 5, with 1 being a normal healthy patient to a 5 representing death expected within 24 hrs
- Wound class – from clean to dirty (class 1-4)
- Length of time between making and closing incision

Impact of Implant

- If patient had implant (i.e. joint prosthesis, sternal wires, heart valve) and deep infection occurs within one year of surgery it counts as a surgical site infection!
- Implant can be seeded from remote infection

Dosage effect

If a surgical site is contaminated with >100,000 microorganisms per gram of tissue, the risk of SSI is markedly increased.

The dose of contaminating microorganisms required to produce infection may be much lower when foreign material is present at the site (i.e., 100 staphylococci per gram of tissue introduced on silk sutures).

Microorganisms may contain or produce toxins that increase their ability to invade a host, produce damage within the host, or survive on or in host tissue. Many gram-negative bacteria can trigger the systemic inflammatory response syndrome that sometimes leads to multiple system organ failure. One of the most common causes of multiple system organ failure in modern surgical care is intra-abdominal infection.

Mangram, Alicia MD and the Hospital Infection Control Practices Advisory Committee. Guideline for the Prevention of Surgical Site Infection, Amer Jour Inf Cont, Vol. 27. No.2, 1999.

Pathogen Effect

- Staph aureus, group A Strep and Clostridium perfringens require only a small inoculum to cause severe infection
- So limit the dose!!

APIC Text of Infection Control and Epidemiology, p23-2, 3rd Ed. 2009

Additional Prevention Measures

- Air flow moves out of OR to push air out
- Limit OR traffic -air may contain microbial-laden dust, lint, skin squames, or respiratory droplets. The microbial level in operating room air is directly proportional to the number of people moving about in the room.

Minimize the Risk

- Appropriate site prep
- Appropriate hand scrub
- Adequate fingernail care
- Healthy healthcare provider