Surgical Attire and the Operating Room: Role in Infection Prevention

300,000 surgical site infections/year
- $10 BILLION in direct costs annually

3 levels of Surgical Site Infection
- Superficial incisional, deep incisional and organ infection
- Must be apparent within 30 days after the procedure or within the first year if implants are used

Contamination and Surgical Site Infection
- Investigators use bacterial contamination (measured by airborne or settled colony-forming unit [CFU] counts) as an adjunct measure of surgical site infection
- Direct correlation between CFUs and surgical site infections has not been proven in the literature
- Theory of aseptic technique is founded on the premise that a reduction in bacterial contamination will reduce the prevalence of surgical site infection.

Surgical Attire
- Scrubs
  - Cotton-polyester-blend scrubs reduced airborne CFUs compared with normal cotton clothing (Dankert et al)
  - Reduction of >50% in airborne CFUs during procedures with the use of tucked and cuffed scrubs (Tammelin et al)
- Arm Covering for Non Scrubbed Personnel
  - Addition of sleeves may increase bacterial fallout due to frictional forces
- Masks
  - No significant difference in the rates of surgical site infection between masked and unmasked groups (Cochrane)
- Head Coverings
  - No significant differences in environmental contamination among all types (Ritter et al)
- Space Suits
  - Literature is divided on the efficacy of space suits in the reduction of bacterial particles in the OR
- Gowns
  - Permeable cotton gowns and drapes are inferior to impervious gown and drape materials in the prevention of surgical site infections
- Gloves
  - William Halsted developed rubber gloves for use in the OR. His rates of surgical site infection were reduced from 9.6% to 1.8% during hernia repairs when gloves were worn by the surgical team.

Operating Room
- Ventilation and UV Lighting
  - Laminar flow and UV light reduce the rates of surgical site infection after total joint arthroplasty (Evans)
- Adhesive Drapes
  - No evidence that iodine-impregnated adhesive drapes reduce the prevalence of surgical site infection
  - Plastic adhesive drapes may increase the rates of surgical site infection
- Instruments and Fluids
  - Splash basin contamination has been reported in the literature to range from 2% to 74%
  - Dalstrom et al. demonstrated that uncovered trays quickly become contaminated once opened in the operating room, even in rooms without people
- Room Traffic
  - Correlation between the number of operating room door openings and increased CFU counts in the OR