

## Traffic Control

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## Objectives

- › Define role of health care industry representatives in OR
- › Discuss need for traffic control of surgical team in OR suite
- › Identify ways to enhance traffic control in OR
- › Discuss role of surgical attire in preventing health care acquired infections



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## Healthcare Representatives in OR

- › Clinical consultants
- › Sales representatives
- › Technicians
- › Repair & maintenance personnel



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## Why are they there?

- ▶ Peri-operative team needs systematic method of providing instruction on new techniques
- ▶ Provide to the peri-Operative team
  - Expertise
  - Education
  - Training opportunities



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## However

- ▶ Healthcare facilities have been cited for
  - Use of unapproved surgical equipment
  - Not providing formal training to physicians and staff
  - Permitting an unauthorized person from medical device company to participate in a procedure

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## Role of Healthcare Representative

- ▶ Provide technical support
- ▶ With training and specific facility approval, may perform calibration of devices
- ▶ Not allowed to provide direct patient care in any circumstances

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## Healthcare Facilities Need...

- ▶ To develop a system that delineates limits on the representatives activities in OR and procedure rooms
- ▶ To maintain a system of documentation of completed instruction in asepsis fire & safety protocols, infection control practices, blood borne pathogens, patients rights, etc.
  - Supplied by representatives employer
  - Facility specific training

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## Role of RN

- ▶ Should monitor industry representatives activities in OR
- ▶ Facilitate the representative's service to the surgical team
- ▶ As part of surgical team, RN should be informed before procedure of representative's presence and purpose

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## Traffic controller

- ▶ RN should monitor and limit number of people in OR during a procedure
- ▶ Prevents increased airborne contamination



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## Traffic control

- ▶ Movement in and out of operative suite as well as movement internally
- ▶ Patterns need to be clearly defined and enforced
- ▶ Safeguards patient privacy
- ▶ Provides security
- ▶ Protects from cross-contamination
  - Personnel
  - Patients
  - Supplies
  - Equipment

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## Six recommendations

1. Clear signage
2. Secure area
3. Limited movement of personnel during procedure
4. Movement of clean and sterile supplies
5. Specific patterns during construction and renovation
6. Support through policies, training, and observational competencies

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## Signage

- ▶ Designed to facilitate movement of patients and personnel into, through and out of defined areas of surgical suite
- ▶ Clearly indicate environmental controls and surgical attire required
- ▶ Controls increase as movement proceeds from unrestricted areas to restricted



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## Designated areas

- ▶ Unrestricted area – central point to monitor entrance of patients, personnel and materials
  - Traffic not limited
  - Street clothes allowed
- ▶ Semi restricted area – peripheral support area
  - Traffic limited to authorized personnel and patients
  - Wear surgical attire
  - Cover all head and facial hair
- ▶ Restricted area – OR and procedure rooms
  - Masks required when open sterile supplies and scrubbed personnel are present
- ▶ Transition zone – enter in street clothes and exit in surgical attire

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## Secure area

- ▶ Clearly visible identification badges worn at all times
  - Clean when visibly soiled
  - Do not wear on lanyard. Keep close to body
- ▶ Controlled access is an option
- ▶ Clear traffic patterns ensure
  - Patient privacy
  - Patient, personnel and visitor safety
  - Protect supplies and equipment from tampering and theft



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## Air and microbial shedding

- ▶ State facility licensing standards provide air pressure and air change guidelines for both operative and procedure rooms
- ▶ Minimum positive pressure with 15 air changes per hour with door to suite closed
- ▶ OR designed for air to flow away from patient
- ▶ Open doors alter air flow and create turbulence
- ▶ Turbulent air carries the skin cells, microbes, and respiratory droplets of the people in the room
- ▶ Air is potential source of microbes that can contaminate the surgical site

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## Limit movement during procedure

- › Preplan patient care and supply needs to reduce excess activity during procedure
- › Keep doors to OR closed except during movement of patients, personnel, supplies, and equipment
- › Minimize number of people present to only essential personnel
- › Minimize talking – surgical masks begin to break down after an hour of use



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## Traffic Control

American Journal of Medical Quality Study

- › Observational Study
- › Data collected included number of people entering/exiting, the role of these individuals, and cause of the event
- › 3071 door openings recorded for 28 cases
- › Traffic varies from 19 to 50 events per hour
- › The pre-incision period represented 30% to 50% of all events
- › Information requests accounted for the majority of events
- › Door openings increase in direct proportion to case length
- › Exponential relationship with the number of persons in the operating room
- › High rate of traffic was noted across all specialties



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## Traffic Control

Journal of Pediatric Orthopaedics Study

Conclusions: There role of surveillance of human traffic in the OR equaled no change in performance. To achieve any change in the OR traffic pattern, monitoring alone may not be sufficient; other novel techniques or incentives may need to be considered.



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## Traffic Control

Exempla Lutheran Medical Center CO  
Used Lean principles adopted from Toyota to reduce foot traffic into and out of the OR.

Problem Addressed:

- Foot traffic is a potential source of infection
- Foot traffic as a potential source of distraction
- Root Cause : staff often did not have the supplies, instruments, and equipment needed

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## Traffic Control

Description of Innovative Activity:

- Simplified and standardized preference cards
  - Elimination of unnecessary and unused items
  - Standardization of formatting, fonts, headings
  - Designation of "Have Available " items , those that may not be utilized, but must be on hand
- Preference list created for listing updates and updated within 1 day
- Post case briefings
- Missing item report attached to front of case cart

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## Traffic Control

### Results

- 32% reduction in foot traffic over 1 yr
- SSI rate decreased by 14%over 1 yr (admittedly no direct cause and effect can be reported)
- Program freed up 7.9 staff hours per day as no longer looking for missing supplies/equipment
- Staff satisfaction surveys improved 6% on the question "necessary material and equipment available when needed"

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## Supply movement

- ▶ Separate clean and sterile supplies from soiled materials by space, time and traffic patterns
- ▶ Transport sterile and clean supplies in manner to maintain cleanliness and prevent physical damage
- ▶ Soiled instruments must be transported in closed containers
- ▶ Soiled linen and trash collection areas must be separated from personnel and patient traffic areas

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## Delivered supplies

- ▶ Remove from external shipping containers in unrestricted area
- ▶ Transfer into surgical suite through transition area
- ▶ Personnel opening shipping containers should not have access to semi and restricted areas



Corrugated layers harbor larva, insects and pests

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## Construction in and around OR

- ▶ Specific traffic patterns for construction personnel, equipment and debris need to be designated and monitored
- ▶ Surgical personnel and equipment must be able to move without cross contamination from construction activities



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## Construction in and around OR

- ▶ Construction can cause spread of microbes due to disruption of natural environmental barriers (drywall, flooring, cabinets)
- ▶ Multidisciplinary team of OR, infection control, safety and construction personnel need to complete a risk assessment and identify prevention measures
  - Barriers
  - Special entrance and exit points
  - Attire for construction workers
  - Air evacuation or filtration



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## Surgical attire in semi-restricted and restricted areas

- ▶ Human body is a major source of microbial contamination
- ▶ Surgical attire is designed to minimize contamination and risk of surgical site infection
- ▶ Intent is to promote a high level of cleanliness in surgical environment
- ▶ Does not address sterile attire worn at surgical field



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## Surgical Attire

AORN 2011 Recommended Practices

2010 = 5 pages  
2011 = 12 pages



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## Surgical Attire

- ▶ Wear freshly laundered surgical attire intended for use only in the semi-restricted and restricted areas
- ▶ Put on immediately before entering semi restricted areas. Don't wear in from home.
- ▶ Can be reusable or single use disposable



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## Surgical Attire

- ▶ Fabric should be low-linting, tightly woven, stain resistant and durable
- ▶ Cotton fabrics with pores greater than 80 microns may allow microorganisms attached to skin squamous cells to pass through.
- ▶ Choose non chafing fabrics and designs
  - Chafing increases dispersal of squamous cells into the environment
- ▶ Two pieces: scrub top needs to be secured at the waist, tucked into the pants, or fit close to the body
- ▶ 100% cotton fleece should not be worn.

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## Surgical Attire

- ▶ Change daily or when visibly soiled. Whichever occurs first
- ▶ All attire should be laundered by heal-care approved or accredited laundry facilities.  
(No longer just a recommendation)

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## Scrubs and blood borne pathogens

- ▶ Visibly soiled or contaminated scrubs need to be removed as quickly as possible and replaced with fresh clean scrubs
- ▶ Surgical attire contaminated with blood or body fluids must remain at the facility and be laundered by facility or contracted commercial laundry
- ▶ Reduces risk of transferring pathogens from facility to staff homes and general public




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## Scrub laundering

- ▶ Use facility based or contracted laundry service
  - Controlled protocol on water temp, detergents and oxidizing agents
  - Repeated changes of water
  - Drying and iron temperatures typically not found in home laundry equipment
- ▶ Protect from contamination during transfer and storage
- ▶ Routine monitoring of laundry service provider – this may include an onsite visit

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## Other garments

- ▶ Nonscrubbed personnel should wear long sleeved jackets that are buttoned
  - Complete closure avoids accidental contamination
  - Long-sleeves prevents bacterial shedding from bare arms
- ▶ Other garments must be completely within or covered by the surgical attire

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## Other personal items

- ▶ Stethoscopes should be cleaned between patients and not worn around the neck.  
Study cultures showed:
  - 79.8% gram-positive bacilli
  - 74.8% Staphylococcus species non-aureus
  - 2.3% MSSA
  - 1% group A strep
- ▶ Fabric stethoscope tubing covers should not be used.
- ▶ Fanny packs, purses, backpacks, briefcases have no place in the semi restricted or restricted areas.

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## Head and hair coverage

- ▶ Eliminates possibility of hair, dandruff, or squamous cells from contaminating surgical attire or field
  - Includes bald or shaved heads
- ▶ Coverage needs to be complete
  - Includes sideburns, necklines
  - Includes facial hair




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## Masks

- ▶ Worn in restricted areas wear open sterile supplies or scrubbed personnel are located
- ▶ Must cover both nose and mouth
- ▶ Designed to contain droplets of microbes expelled from the mouth during talking, sneezing or coughing
  - When saturated, filtering capability decreases
  - Remove by handling ties only
- ▶ Never save a mask.
- ▶ Discard after each use




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## Jewelry

- ▶ Rings should be removed from hands
  - Harbor microbes that cannot be removed with hand hygiene practices
- ▶ Other jewelry (watches, bracelets, earrings, piercings, necklaces) are removed or completely confined within the surgical attire
  - Prevent risk of falling on sterile field

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## Fingernails

- ▶ Clean and short
  - Easier to remove debris and microbes from under nail
  - Decrease risk of tearing gloves
  - Decrease risk of patient injury during positioning
- ▶ Fresh nail polish
  - Nail polish that is chipped or older than four days has greater number of bacteria
  - Been associated with infections
- ▶ No artificial nails
  - Promote fungal and bacterial growth
  - Associated with health care acquired infections

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## Shoes and shoe covers

- ▶ Shoes need to be clean with no visible soiling
  - Closed toe
  - Solid surface
  - Low heeled
  - Non-skid soles
- ▶ Shoe covers
  - Keep shoes clean
  - Remove before leaving surgical area
  - Change if torn or wet

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## Eyewear

- ▶ Use protective eyewear when splashing or spraying is likely
  - Goggles
  - Safety glasses
  - Face shields




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## Non-sterile gloves

- ▶ Used to prevent gross contamination of hands
- ▶ Hand hygiene before placing and after removing gloves
- ▶ Change between patients
- ▶ Change when moving from contaminated task to clean task
- ▶ Gloves are not a substitute for hand hygiene




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## Patient surgical attire

- ▶ Clean gowns
- ▶ Hair covers
- ▶ Clean bed linens
- ▶ Masks not required unless under airborne precautions
- ▶ Clean personal undergarments allowed when they will not interfere with surgical site

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## Policies and procedures

- ▶ Establish authority, responsibility and accountability
- ▶ Serve as operational guidelines
- ▶ Assist in development of patient safety and quality assessment/improvement activities
  - QA programs evaluate compliance of policies
- ▶ Information on traffic patterns and transporting of supplies and equipment should be given at hire and annually to develop knowledge and attitudes



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## References

- ▶ Association of PeriOperative Registered Nurses. Perioperative Standards and Recommended Practices 2011 Edition
- ▶ Center for Disease Control and Prevention, "Guideline for Hand Hygiene in Healthcare Settings, 2002"  
<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5116a1.htm>
- ▶ Center for Disease Control and Prevention, "Guideline for Prevention of Surgical Site Infection, 1999"  
<http://www.cdc.gov/ncidod/dhqp/pdf/guidelines/ssi.pdf>

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## QUESTIONS? Traffic Control & Surgical Attire

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