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BACKGROUND

- The operating room (OR) environment is known as a potential source of surgical site infection SSIs.
- Humans constitute the main reservoir of air contaminants in the OR shedding large amounts of particles (1)
- A correlation between air contamination with microorganisms and wound contamination after total hip or knee surgery was reported in the past (2)
- The laps in discipline of healthcare professionals (HCPs) in OR can increase the infectious risk and compromise the patient safety (3)
- Understanding the traffic flow is a prerequisite for shaping improvement strategies of behavior changes.
- We make the hypothesis that disciplines in the OR as to be considered as a whole and depend of safety and positive organizational culture, leadership in the OR.

OBJECTIVES

- This present study aims to:
 1. Assessed the discipline of OR staff represented by:
 - The clothing
 - The traffic flow during surgical procedures,
 2. Investigated the reasons of non-conformities

METHODS

- Multicenter observational survey from 01/15 to 09/2015

Population and location of the study

- 17 French healthcare facilities: 2/17 (12%) university hospitals, 7/17 (41%) public and 8/17 (47%) private facilities
- All categories of HCPs present in the OR were included
- 4 main surgical specialties:
 - Orthopedic: arthroplasty with hip and knee implant
 - Obstetric: C-section
 - Digestive: Hernia/gallbladder
 - Gynecology: hysterectomy/tumorectomia
- Other types of procedures (i.e. urology or ophthalmology) were also included in the analysis
- Elective/urgent, conventional/ endoscopic procedures for hospitalized/ambulatory adult patients

Criteria collected

- Direct observation in the OR
- Clothing rules: mask, scrub suits, head covers, shoes covers and absence of jewels. Creation of a composite score per OR for clothing based on the addition of 8 indicators
- The time when packs of sterile instruments were opened

Criteria collected

- The traffic flow: direct observation of the number of persons in the OR at incision, and the number and reasons for entries/exits between the incision and wound closure.

Statistical analysis

- Descriptive and univariate analysis using Stata release 10.0

RESULTS

Respect of the dress code

- 1615 professionals during 282 procedures observed
- The mean score for the respect of clothing was 7.4 among the 8 indicators assessed (surgeons: 7.5; anesthetists: 6.9; nurses: 7.6; others: 7.3)
- 67% of sterile instruments boxes were open < 15 minutes before the incision

1615 observations	% (N)
Scrub suit worn	99% (1608)
No civil clothes under the suit	97% (1560)
Special boots or shoe covers	97% (1562)
Surgical caps/hoods	98% (1579)
Caps/hoods uncovering hairs	75% (1208)
Masks worn	98% (1588)
Masks incorrectly placed or fasten	93% (1512)
Hand without jewels	79% (1274)

Table 1: Descriptive results for the 8 indicators of clothing

Traffic flow

- 212 operations included:
 - 66 (31%) orthopedic surgery (25 hips, 14 knees)
 - 64 (30%) gynec-obstetric (17 C-sections, 9 hysteroscopies, 7 hysterectomies, 6 tumorectomies),
 - 57 (27%) gastro-intestinal (28 hernias, 10 gallbladders),
 - 11 cataract replacements, 9 vascular surgeries and 5 in other specialties (dermatology, urology).
- 200 (94%) were elective and 12 (9%) urgent procedures.

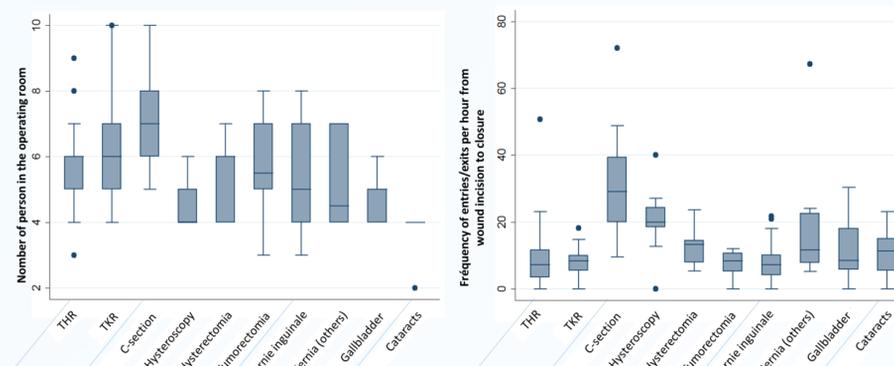


Figure 1: Number of persons and entries/exits according to procedures

- 817 reasons of entries/exits informed: 364 (44.5%) corresponded to a lack of material, 113 (13.8%) for communication and 107 (13.1%) were linked to the staff planning (switch of team members, breaks...).

Characteristics	Means (SD)	p
Mean number of persons in the OR		
Urgent	6.1 (1.7)	0.09
Elective	5.3 (1.5)	
University/Public hospitals	5.6 (2.9)	0.10
Private hospitals	5.2 (1.4)	
Frequency of entries/exits per hour		
Urgent	21.6 (22.5)	0.36
Elective	14.5 (14.1)	
University/Public hospitals	18.8 (15.2)	<0.001
Private	12.7 (14.1)	
Anesthetists	16.5 (16.4)	0.13
Others	13.7 (13.5)	
Surgeons	23.2 (23.6)	0.27
Others	14.5 (14.1)	
Nurses	15.2 (11.5)	0.14
Others	14.8 (16.1)	
Visitors...	9.1 (11.8)	<0.001
Others	16.4 (15.1)	

Table 2: Results of the univariate analysis

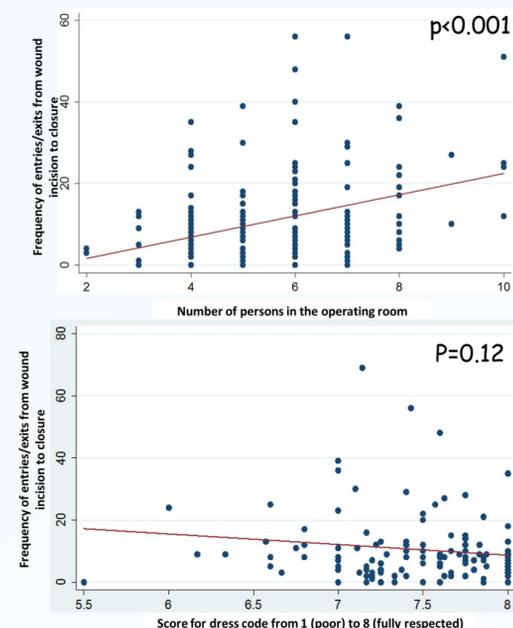


Figure 2: Results of linear regression analysis

CONCLUSION

- The discipline of healthcare professionals in ORs is suboptimal and may lead to an increased infectious risk.
- Despite a global respect of clothing rules, some efforts can be performed by removing arm jewelry.
- The traffic flow was heterogeneous. A part of the variability may be explained by specific tasks (anesthetists supervising several OR, cares of babies after C-section).
- A large part of entries/exits are probably avoidable by an anticipation of supplies preparation before the procedure and the improvement of the communication
- The main originality of this study is the correlation between the respect of clothing and traffic flow suggesting that the discipline in ORs as to be seen as an overall factor influencing patient safety
- Awareness campaigns, management, organization, ergonomic and anticipation may improve the discipline.

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