CONCLUSIONS: Organizations should carefully consider how to implement infection prevention recommendations from external agencies in order to create policies that satisfy those recommendations and simultaneously meet the needs of patients, families, and staff. Communicating changes in isolation policies throughout a large enterprise presents specific challenges.

OR Issues & Environmental Contamination

Presentation Number 024

Breath of Fresh Air: An Observational Study of Factors That Compromise Operating Room Air Quality

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BACKGROUND: Understanding what leads to high airborne particulate levels in the operating room (OR) is crucial for improving patient safety and surgical outcomes. This study examined whether the number of times OR doors are opened affects airborne particulate counts.
METHODS: Particulate levels and observations were recorded from a single location in a modern, positive pressure OR approximately every five minutes during eight surgical procedures over five days. Observations recorded: which OR door was opened (whether to the sterile core or to the outer corridor); the number of times the door was opened; the job title of the person opening it; and the reason for opening it. Baseline data was collected in the morning before any activity. Reference samples were taken in the OR, sterile core, outer corridor and surgical wing front desk.
RESULTS: One or more OR doors were open during 48% of all readings (333/697). Overall airborne particulate count increased when either door was open ($p<0.1950$). For particles larger than 0.5 microns, there was a significant increase in particulate counts when either door was open ($p<0.0001$). Particulate levels were higher during cases than between cases ($p<0.0286$). The most common reasons for opening either door were for case equipment (29%, 95% CI [25%, 34%]), status updates (12%) and work-related conversations (8%).
CONCLUSIONS: Each time an OR door is opened, the number of airborne particulates increases: this increases the risk of airborne particulates entering the sterile field. This data supports interventions aimed at increasing the use of intercoms/viewing monitors, equipment bundling, kit review, and maximizing teamwork. These strategies will minimize unnecessary door openings and help prevent surgical site infections. Although unanticipated circumstances are a fact of life in academic hospitals, medical institutions must develop best practices that maximize patient safety without compromising the pedagogic mission.

Presentation Number 025

Construction and Implementation of an Operating Room Management Plan for the Prevention of Perioperative Hypothermia

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BACKGROUND: Perioperative hypothermia (PH) is a complication in surgical patients that can lead to an increased risk of postoperative infection due to vasoconstriction and impaired immunity. There are several risk factors that place patients at a higher risk for PH, including a cold surgical environment. The Texas Administrative Code (TAC) has defined ventilation requirements for operating suites. However, the TAC notes the likelihood of surgeon preferences and allows variance given multidisciplinary agreement. We undertook to develop a risk assessment and management plan for PH and evaluated it for effectiveness.
METHODS: This multidisciplinary workgroup met February-July 2014. We first identified the most common surgical procedures via volume trending reports. We then used literature to determine the most common co-morbidities in patients undergoing those specific surgeries, cross referenced with those that place patients at higher risk of PH. The risk assessment was then constructed for various temperature ranges (see figure), and risk assigned according to probability, patient effect and our preparedness to re-establish normothermia.
RESULTS: We determined that patients who undergo bariatric, spine, pediatric and total joint procedures are at a high risk of PH in operating rooms with temperatures less than 62F. As a result, a new process was created that required intraoperative warming of all patients in this risk category, as well as frequent, documented temperature checks, and possible room temperature adjustment. A brief evaluation of the new process demonstrated a lack of significant temperature changes between patients in the higher and lower risk categories.
CONCLUSIONS: Though surgeons have varying temperature preferences for operating rooms, it is important to protect our patients from the complications associated with PH, while remaining flexible. The risk assessment allowed us to customize our processes to best accomplish this task. We have seen success in the prevention of perioperative hypothermia among our patients.

1. Assessment of probability should be the probability that a patient develops hypothermia given the temperature is in the specified range, during the specified procedure, or while the specified underlying condition(s) exist.
2. Assessment of patient effect should be the effect on the patient should hypothermia occur during the specified procedure, or while the specified underlying condition(s) exist.
3. Assessment of preparedness should be our preparedness to bring a patient out of hypothermia into normal temperature range in a short amount of time during the specified procedure, or while the specified underlying condition(s) exist.
4. A score of 8 or above is considered a high risk.

Temperature Range	<62 F											
	PROBABILITY[1]			PATIENT EFFECT[2]					PREPAREDNESS[3]			TOTAL[4]
				Threat to Life, Health, and Safety								
SCORE	HIGH	MED	LOW	SEVERE / DEATH LIKELY	SEVERE/ LIFE THREATENING INJURY	SERIOUS INJURY/ POSSIBLE THREAT TO LIFE	MODERATE INJURY/ DEATH UNLIKELY	MILD INJURY / NO THREA	POOR	FAIR	GOOD	
Procedure Type	3	2	1	5	4	3	2	1	3	2	1	
Sleeve Gastrectomy/Bypass	3					3				2		8
Diabetic neuropathies												
Use of antipsychotics/antidepressants												
Cardiovascular disease												
Total Joint (Hip/Knee)	3					3				2		8
Increased age												
Metabolic disorders including CNS dysfunctions, CVD, hypothyroidism, hypopituitarism, diabetic												
360 Fusion	3					3				2		8
Open-cavity surgery required												
Arthroscopy		2					2			2		6
ENT	3					3				2		8
Young age												
Low body weight												
Foot/Ankle/Elbow/Hand		2					2			2		6
Pain			1					1		2		4

Temperature Range	62-67 F											
	PROBABILITY			PATIENT EFFECT					PREPAREDNESS			TOTAL
				Threat to Life, Health, and Safety								
SCORE	HIGH	MED	LOW	SEVERE / DEATH LIKELY	SEVERE/ LIFE THREATENING INJURY	SERIOUS INJURY/ POSSIBLE THREAT TO LIFE	MODERATE INJURY/ DEATH UNLIKELY	MILD INJURY / NO THREA	POOR	FAIR	GOOD	
Procedure Type	3	2	1	5	4	3	2	1	3	2	1	
Sleeve Gastrectomy/Bypass		2				3					1	6
Diabetic neuropathies												
Use of antipsychotics/antidepressants												
Cardiovascular disease												
Total Joint (Hip/Knee)		2				3					1	6
Increased age												
Metabolic disorders including CNS dysfunctions, CVD, hypothyroidism, hypopituitarism, diabetic												
360 Fusion		2				3					1	6
Open-cavity surgery required												
Arthroscopy			1				2				1	4
ENT		2				3				2		7
Young age												
Low body weight												
Foot/Ankle/Elbow/Hand			1				2				1	4
Pain			1					1			1	3

Presentation Number 026

Rapid Microbial Tracer Movement to Soft Surfaces Throughout Patient Care Areas and the Role of Mixed Surfaces in Infection Prevention

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BACKGROUND: No studies to date have fully evaluated the fate and transport of microbes relative to surface varieties common to healthcare settings, including both hard, non-porous and soft, porous surfaces. Understanding the potential for mixed surface cross-contamination and the relationship between transport mechanisms and patient risks is important for effective infection control. This research engaged infection prevention, environmental service, and other healthcare personnel in the identification of needs and best practices in surface decontamination. Additionally, a microbial tracer was used to track pathogen fate and transport potentials during routine operations.

METHODS: Online surveys were administered to 129 healthcare workers. Bacteriophage tracers were seeded on a volunteer's hands or a single surface in 6 healthcare sites (physician offices and long-term care facilities). After 4 hours, surfaces (n=167) were swabbed for microbial tracers.

RESULTS: Survey data indicated that the majority of healthcare professionals are concerned about soft surface contamination but do not clean them as frequently as hard surfaces. More than a third of respondents are unaware of soft surface decontamination solutions. Up to 70% of long-term care facility and 42% of physician office soft surfaces tested positive for the tracer.

CONCLUSIONS: Data show rapid transfer of microbes within the healthcare setting and indicate a need for improved and comprehensive infection control procedures. Critical is the consideration of all surface textiles and materials, as an assembly, to identify areas with high levels of bioburden and the highest risk of cross-contamination. Research gaps include the need for determining