

**Estimation of hazards and risks emphasizing blood borne
exposures in operating room**

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**By
Noha Muhammad el Qareh
MB, BCh degree in medicine and surgery
Faculty of medicine
Cairo University**

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Under supervision of:

**Prof. Dr. Mona Soliman
Professor of Public Health &
Head of public health departement
Faculty of medicine
Cairo University**

**Prof. Dr. Hanan Ali Sayed
Professor of Public Health
Theodore Bilharz Research institute**

**Dr. Moshira Zayed
Lecturer of Public health
Faculty of Medicine
Cairo University
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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

To my Mom and Dad: "Thank you for being there in my life, I love you".

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ABSTRACT

The operating room (OR) has always been a major public health concern. Safety in the OR means the safety of both the patient and the working personnel (surgeons, anesthesiologists, nurses and workers). Patient safety initiatives aimed at creating a safer OR culture is increasingly being adopted. The world health organization (WHO) has launched the "Safe surgery saves lives" initiative by the world alliance for patient safety as a part of WHO efforts to reduce the number of surgical deaths across the world.

KEY WORDS

Operating room- Patient safety- Occupational safety- Blood borne exposures- Risk assessment.

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Abbreviations	=
ACH	Air change rate.
ACGME	Accreditation Council on Graduate Medical Education.
ANSI	American national standards institute.
AORN	Association of perioperative registered nurses.
ASHRAE	American society of heating, refrigerating and air-conditioning engineers.
CAL/OSHA	California division of occupational safety and health.
CCOHS	Canadian centre for occupational and health safety.
CDC	Centers for disease control and prevention.
CPC	Chemical protective clothing.
DHSSS	Duke Health and Safety Surveillance System.
HBV	Hepatitis B virus.
HCV	Hepatitis C virus.
HCW	Health care workers.
HIV	Human immunodeficiency virus.
HVAC	Heating, ventilation and air conditioning.
FDA	Food and drug administration.
JABSOM EHSO	John A. Burns school of medicine, environmental health and safety office.
MRSA	Methicillin resistant <i>staphylococcus aureus</i> .
MT SHB	Montana occupational safety and health bureau.
NaSH	National Surveillance System for Health Care Workers.

NIOSH	National institute of occupational safety and health.
OR	Operating room.
OSHA	Occupational safety and health administration.
PACU	Post anesthesia care unit.
PEP	Post exposure prophylaxis.
PPE	Personal protective equipment.
SSI	Surgical site infection.
STF	Slips, trips and falls.
VRE	Vancomycin-resistant <i>enterococcus</i> .
UQ OHS	University of Queensland, occupational health and safety.
WHO	World health organization.

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Introduction

Safety in the operating room (OR) has always been a major public health concern. Safety in the OR means the safety of both the patient and the working personnel (surgeons, anesthesiologists, nurses and workers). Within the scope of the public health practice, occupational safety in health profession is devoted to the recognition, evaluation and control of hazards in the working environment. Hazards include physical, chemical and biological hazards. They also include ergonomic factors that cause or contribute to injury, disease, impaired function or discomfort. Successful occupational hygiene practice has been defined to include a step that is in some ways preliminary to hazard recognition: the anticipation of hazardous exposures and conditions before they actually occur. For established workplace conditions, surveillance of both exposure and disease provides clues and hypothesis for further evaluation. Hazard evaluation is the type of risk assessment developed from the information gained in the hazard recognition and identification process and the characteristics of the (exposed) population at risk (**Herick et al., 2008**).

The series of steps in reaching a conclusion about the degree of hazard associated with a particular exposure or work condition is known as hazard evaluation. Hazard evaluation is essential to determine the need for control measures to minimize exposures and to identify clues to the etiology of an adverse health condition observed in a worker or group of workers. Hazard recognition involves a systematic review of a worker's occupational environment to identify exposures and potential exposures. Hazard recognition also includes gathering information on the type of equipment used in the workplace, the cycle of operation and / or frequency of exposure, and the operational methods and work practices used. A workplace review for the purpose of hazard recognition also includes identification of health and safety controls in place, including use of personal protective equipment (**Herick et al., 2008**).

Introduction & aim of the work

Improving patient safety is an increasing priority for surgeons and hospitals since sentinel events can be catastrophic for patients, caregivers and institutions. Patient safety initiatives aimed at creating a safer OR culture is increasingly being adopted. The world health organization (WHO) has launched the "Safe surgery saves lives" initiative by the world alliance for patient safety as a part of WHO efforts to reduce the number of surgical deaths across the world. The aim of this initiative is to harness political commitment and clinical will to address important safety issues, including inadequate anesthetic safety practice, avoidable surgical infection and poor communication among team members. These have proved to be common, deadly & preventable problems in all countries & settings **(WHO, 2004)**.

On the other hand, working personnel are also exposed to many hazards in the OR. Those hazards may include : bloody or body fluid exposure from needle stick injury or sharp in general, exposure to waste anesthetic gases, possible exposure to chemical cleaning agents, slips/trips/ falls hazards, exposure to laser, electrical shock hazards, fires, latex allergy, hazards due to compressed gases and static postures **(OSHA,2008(a))**.

The occupational safety & health administration (OSHA) estimates that 8 million workers in the health care industry are at risk of occupational exposure to blood borne pathogens. These pathogens include HIV, HBV, HCV and others. Any worker handling sharp devices or equipment (e.g.): scalpels, needles can be at risk. The American national institute of occupational safety (NIOSH) estimates that about 600,000 to 800,000 needle stick injuries occur annually in hospital settings. Thus certain standards have been set by the OSHA including using personal protective equipment (PPE), proper hand washing techniques and many others **(OSHA,2008(b))**.