

Infection Control in Hepatology and Gastroenterology Healthcare Facilities

Essay

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Tropical Medicine*

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List of Abbreviations

AAMI	:	Association for the Advancement of Medical Instrumentation
AERs	:	Automated endoscope reprocessors
ASCC	:	Australian Safety and Compensation Council
ASGE	:	American Society for Gastrointestinal Endoscopy
ASTM	:	American Society for Testing and Materials
A-V fistula	:	Arteriovenous fistula
BSI	:	Blood stream infections
C. difficile	:	Clostridium difficile
CAIDS	:	Cirrhosis-associated immune dysfunction syndrome
CAP	:	Community-acquired pneumonia
CAUTI	:	Catheter associated urinary tract infection
CDC	:	Center of Disease Control
CHG	:	Chlorhexidine Gluconate
CJD	:	Creutzfeldt-Jacob disease
CRBSI	:	Catheter related blood stream infection
CT	:	Computed Tomography
CVCs	:	Central Venous Catheter
EDTA	:	Ethylenediaminetetraacetic acid
EPA	:	Environmental Protection Agency
ESGE	:	European Society of Gastrointestinal Endoscopy
FDA	:	Food drug administration
GI	:	Gastrointestinal
H pylori	:	Helicopacter Pylori
HBsAg	:	Hepatitis B surface Antigen
HBV	:	Hepatitis B Virus
HCV	:	Hepatitis C Virus
HCWs	:	Health care workers
HEPA	:	High efficiency particulate air
HICPAC	:	Healthcare Infection Control Practices Advisory Committee

List of Abbreviations (Cont.)

HIV	: Human immunodeficiency virus
HLD	: High Level of Disinfection
HPS	: Health protection Scotland
HSV	: Herpes simplex virus
ICU	: Intensive Care Unit
IL	: Interleukin
IV	: Intravenous
LB	: Liver Biopsy
MDROs	: Multi-drug resistant organisms
MROs	: Multi-resistant organisms
MRSA	: Methicillin resistant Staphylococcus aureus
MSB	: Maximum sterile barrier
NHMRC	: National health and medical research council
NO	: Nitric Oxide
P. aeruginosa:	Pseudomonas aeruginosa
PAPRs	: Powered Air purifying respirators
PEP	: Post exposure prophylaxis
PICCs	: Peripherally inserted central catheters
PIDAC	: Provincial Infectious Disease Advisory Committee
PLB	: Percutaneous Liver Biopsy
PMN	: Polymorphonuclear
PPE	: Personal Protective Equipment
PSC	: Primary sclerosing cholangitis
PSHSA	: Public Services Health & Safety Association
QACs	: Quaternary ammonium compounds
RF	: Radiofrequency
RFA	: Radiofrequency ablation
RSV	: Respiratory Syncytial Virus
SARS	: Severe acute respiratory syndrome
SBP	: Spontaneous Bacterial Peritonitis
SGNA	: Society of gastroenterology nurses and associates

List of Abbreviations (Cont.)

SIRS	: Systemic Inflammatory Response Syndrome
RE	: Reticuloendothelial
TACE	: Trans-arterial chemoembolization
TB	: Tuberculosis
TGA	: Therapeutic Goods Administration
TIPS	: Transjugular Intrahepatic Portosystemic Shunt
TNF- α	: Tumour Necrosis Factor α
US	: Ultrasound
USTG	: Ultrasound transmission gel
UTIs	: Urinary tract infections
vCJD	: Variant Creutzfeldt-Jacob disease
VCSUG	: Victorian Cleaning Standards User Group
VRE	: Vancomycin Resistant Entero-coccus
WHO	: World Health Organization

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Introduction

Infection control refers to policies and procedures used to minimize the risk of spreading infections, especially in hospitals and health care facilities.

Nosocomial infection: An infection that develops during or as a result of an admission to a hospital and was not incubating at the time of admission (*Siegel et al., 2007*).

Healthcare associated infections are associated with higher healthcare costs and may act as a surrogate for hospital quality of care (*Kang et al., 2005*). Healthcare-associated infections are also associated with considerable morbidity and mortality among infected patients and continue to increase in incidence despite laborious and costly infection prevention efforts (*Toubes et al., 2003*).

The health-care environment contains a diverse population of microorganisms, but only a few are significant pathogens for susceptible humans (*Bennett et al., 1998*).

Chain of infection components (*Greene, 1969*):

1. Adequate number of pathogenic organisms (dose)
2. Pathogenic organisms of sufficient virulence
3. A susceptible host
4. An appropriate mode of transmission or transferal of the organism in sufficient number from source to host
5. The correct portal of entry into the host

Standard precautions are the basic level of infection control precautions which are to be used, as a minimum, in the care of all patients (*Siegel et al., 2007*).

Hand hygiene is a major component of standard precautions and one of the most effective methods to prevent transmission of pathogens associated with health care (*WHO, 2009*).

In addition to hand hygiene, the use of personal protective equipment should be guided by risk assessment and the extent of contact anticipated with blood and body fluids, or pathogens (*WHO, 2009*).

Environmental:

Cleaning and disinfecting non-critical surfaces in patient-care areas are part of Standard Precautions. The cleaning and disinfection of all patient-care areas is important for frequently touched surfaces, especially those closest to the patient, that are most likely to be contaminated (e.g., bedrails, bedside tables, commodes, doorknobs, sinks, surfaces and equipment in close proximity to the patient) (*Bhalla et al., 2004*).

The frequency or intensity of cleaning may need to change based on the patient's level of hygiene and the degree of environmental contamination and for certain for infectious agents whose reservoir is the intestinal tract (*Donskey, 2004*).

Toilet seats, flush handles, wash-hand basin taps, surfaces and toilet door handles should be cleaned at least daily or more often, depending on use. Hot water and detergent should be used for this purpose (*WHO, 2009*).

Ideally, disposable gloves and cloths will be used for cleaning. These may be disposed of by placing them in a plastic bag, sealing the neck and placing with solid waste (*WHO, 2009*).

Needles and sharp related injuries:

Injuries due to needles and other sharps have been associated with transmission of HBV, HCV and HIV to healthcare personnel (*Do et al., 2003*). The prevention of sharps injuries has always been an essential element of Universal and now Standard Precautions.

These include measures to handle needles and other sharp devices in a manner that will prevent injury to the user and to others who may encounter the device during or after a procedure. These measures apply to routine patient care and do not address the prevention of sharps injuries and other blood exposures during surgical and other invasive procedures that are addressed elsewhere (*Holodnick and Barkauskas, 2000*).

Endoscope reprocessing

Compliance with guidelines is the chief factor compromising the safety of endoscope reprocessing. The consequences of failure to follow recommendations may be not only transmission of pathogens, but also misdiagnosis (due to pathological material from one patient being introduced into the next patient), instrument malfunction, and a shortened instrument lifespan (*ASGE et al., 2011*).

Surveillance:

Surveillance is defined as the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health (*German et al., 2001*).

Surveillance of both infection control process measures and the infection rates to which they are linked are important for evaluating the effectiveness of infection prevention efforts and identifying indications for change (*Bratzler and Houck, 2004*).

Aim of the Work

Formal review and analysis of recent recommendations for:

- * Core infection prevention and control interventions for health-care facilities including:
 - Hand hygiene.
 - Personal protective equipment.
 - Isolation precautions.
 - Aseptic technique.
 - Cleaning and disinfection.
 - Sterilization.
 - Waste management.
- * Environmental Infection Control in Health-Care Facilities.
- * Standards of Infection Control in Reprocessing of Flexible Gastrointestinal Endoscopes.
- * Standards for IV cannula insertion and infusion therapy.
- * Standards for collection and transport of fresh blood sample.
- * Standards for ascitic paracentesis (tapping).
- * Standards for nasogastric tube insertion and care.
- * Standards for Sengstaken – Blakmore tube insertion.
- * Standards for urinary catheter insertion and care.
- * Standards for central venous access.
- * Standards for liver biopsy.
- * Standards for interventional radiology:
 - Radiofrequency, ethanol injection, transarterial chemoembolization procedures for hepatocellular carcinoma.
 - Transjugular intrahepatic portosystemic shunt (TIPS) for Budd-Chiari Syndrome.

Health-care Associated Infection

Healthcare-associated infection (HAI) is a localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was not present on admission to the acute care facility (**CDC, 2014**).

CDC, 2014 considered an HAI if all elements of a Center of Disease Control and prevention (CDC)/National Healthcare Safety Network (NHSN) site-specific infection criterion were not present during the Present On Admission (POA) time period but were all present on or after the third calendar day of admission to the facility (the day of hospital admission is calendar day 1).

But if all of the elements used to meet a CDC/NHSN site-specific infection criterion are present during the two calendar days before the day of admission, the first day of admission (day 1) and/or the day after admission (day 2) and are documented in the medical record, the infection is considered POA. (**CDC, 2014**).

All elements used to meet the CDC/NHSN site-specific infection criterion must occur within a timeframe that does not exceed a gap of 1 calendar day between any two adjacent elements. The definition of a gap day is a calendar day during which no infection criterion elements are present.

HAIs may be caused by infectious agents from endogenous or exogenous sources: (**CDC, 2014**)

- **Endogenous sources** are body sites, such as the skin, nose, mouth, gastrointestinal (GI) tract, or vagina that are normally inhabited by microorganisms.

- **Exogenous sources** are those external to the patient, such as patient care personnel, visitors, patient care equipment, medical devices, or the healthcare environment.