

Review Article

Standard Precautions in Clinical Practices: A Review

Oladimeji ADEBAYO¹, Adetunji LABIRAN², Laura IMARHIAGBE³

¹Department of Medicine, University College Hospital, Ibadan, Nigeria.

²Department of Community Medicine, Igbinedion University, Okada.

³Department of Medicine, Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife.

Corresponding Author: Oladimeji ADEBAYO

Received: 22/07/2015

Revised: 18/08/2015

Accepted: 25/08/2015

ABSTRACT

Standard Precautions are recommended in care delivery to all patients, regardless of their presumed infectious state. It is a very important principle and practice among health workers globally. Non adherence may lead to infection with possible illness, disability and fatality. It is a principle that kept evolving till its present state as various infectious agents emerge and reemerge.

A review of articles related to standard precautions found on Medline, Google scholar and some institutions depository online was done.

The knowledge and practice of this principles which includes hand washing and hygiene, use of protective barriers, environmental control, handling and adequate discarding of sharp instruments including needles, patient's accommodation in accord to requirement levels as an infection transmission source, respiratory hygiene and cough etiquette are necessary in all clinical settings. We have provided an update of the evolution and the principles in this article.

Keywords: Standard precaution, healthcare, safety, health workers, hygiene, universal, precaution, Infection control.

INTRODUCTION

Standard precautions are basic level of infection control precautions in the care of all patients meant to reduce the risk of transmission of blood-borne and other pathogens from both recognized and unrecognized sources. ⁽¹⁾ It is also those precautions designed to prevent and control the risk of acquiring occupational infection from both known and unexpected sources in the healthcare setting. ⁽²⁻⁶⁾

Standard Precautions are recommended for the care delivery to all patients, regardless of their presumed

infection state. It is important when handling equipment and devices that are contaminated or suspected of contamination, and in situations with risk of contact with blood, body fluids, secretions and excretions, without considering the presence or absence of visible blood and non-intact skin and mucous tissues. ^(1,7)

Exposure and subsequent infection have serious implication on the health workers' and their patients' health and quality of life in advent of infection. ⁽⁷⁾ Therefore Standard Precaution is important in all health care setting. ⁽¹⁾ Generally these

standards are recommended by Centre for Disease Control and Prevention (CDC) (United States of America), European Centre for Disease Control and Prevention and World Health Organisation etc. (1, 8, 9)

The practice and enforcement of standard precaution would lead to reduction of infection in healthcare setting, even when the source of infection is not known. (10) The golden goal is for the health worker to protect self and others from infections.

Recent emergence and reemergence of infectious diseases like Severe Acute Respiratory Syndrome (SARS), Middle-East respiratory syndrome (MERS) and Ebola Virus Disease (EVD) among other diseases have made the knowledge, practice and enforcement of standard precautions important more than ever. (11-13) although emerging diseases like H5N1 is associated with low risk in term of patients to health workers with or without PPE. (14)

Generally Standard Precautions in Healthcare settings and among health workers aims to reduce transmission in healthcare settings, reduce contact with blood and body fluids in order to reduce transmission of other blood borne infection and prevention of parenteral, mucous membrane and non-intact skin exposure of HCW (strictly adhere) to reduce risk of disease transmission in the healthcare setting. (10) Due to the nature of their work they have high degree of exposure or risk of acquiring infections from their patients. (3,7,15)

Adverse outcome due to non-compliance are also commonly reported. (16) The risk of HIV, HBV and HCV from blood exposures are 0.3%, 21-31% and 1.8% respectively. (10,17) Non adherence constitutes occupational risk. According to World Health Organization (WHO) exposures at work results in about 2.5% of HIV cases among HCWs 40% of hepatitis B and C cases among HCWs worldwide.

World Health Organization (WHO), in year 2002, estimated Sharp injuries resulted in 16 000 hepatitis C virus, 66 000 hepatitis B virus 1000 HIV infections in health care workers worldwide. (18)

Those at risk are not just health workers but also students like medical students. (2, 19) The sheer number of health workers involved makes it imperative to make updated & current information available. The implication of non-adherence includes infection with illness, disability and fatality.

It has been documented that the level of knowledge of standard precautions is inadequate among health care providers. (17, 20-22) There is also documented evidence of poor practice of these principles in various centre across healthcare. (17,23,24) Noncompliance to standard precaution in clinical setting particularly among doctors and nurses are due to insufficient knowledge, workload, forgetfulness, workplace safety and the insight that colleagues also failed to follow. (15, 25,26)

Access to information regarding to standard precaution would help enhance the knowledge and practice. (15) Awareness also helps to enhance usage of protective devices. (15)

The knowledge, attitude and practice across various setting around the world have various outcome and also across the professional groups. Higher proportion is likely to have the knowledge with decreasing number practicing the same.

History: The concept of Standard Precaution in Healthcare setting did not assume its present form in nomenclature and principle at once. (15) The concept emerged with the emergence of HIV/AIDs in the early 1980s'.

In 1983, Centre for Disease Control and Prevention(CDC) of United State of America published a document titled "*Guideline for Isolation Precautions in*

Hospitals" that recommended blood and body fluid precautions when a patient was known or suspected to be infected with blood-borne pathogens. ⁽²⁷⁾

By August 1987 the same body published "*Recommendations for Prevention of HIV Transmission in Health-Care Settings*" which included recommendations for Universal Precautions which was further reviewed to include all precaution to prevent infections which include human immunodeficiency virus, Hepatitis B virus and other blood borne pathogen regardless of infection status when providing care in healthcare setting. ^(27,28)

The whole recommendation was modified 'Standard precautions' through a publication in 1996 by CDC by recognizing that any body fluid may contain contagious and harmful microorganisms and prevention must be based along such observation. ⁽²⁸⁾

The concept of Universal Precaution expect precautions when encountering a suspicious blood contact, while the latter modification of concept yielded- *Body Substance Isolation* which takes into cognizance that healthcare workers should protect self from all potentially infectious body substance. It finally evolved to special precaution which entails protection from all body. ^(29,30)

The emergence of severe SARS epidemics led to development and inclusion of respiratory hygiene/ cough hygiene as a component of standard precaution. ⁽⁹⁾ Furthermore the emergence of Ebola Virus Disease has informed the protection from sweat whether blood stained or not. ⁽³¹⁾

Component of Standard Precautions: Standard precaution entails hand washing, use of barriers (e.g., gloves, gown, cap, mask), care of devices, equipment and clothing used during care, environmental control e.g., surface processing protocols, health service waste handling), handling and adequate discarding of sharp instruments

including needles, respiratory hygiene and cough etiquette and patient's accommodation in accordance to requirement levels as an infection transmission source.

What are body fluids we should take precautions against?: The most important body fluid precaution is taken against is blood which is a very important source for HIV, HBV and other blood borne pathogens, cerebrospinal fluid, peritoneal fluid, synovial fluid, pleural fluid, pericardial fluid, amniotic fluid, semen, vaginal fluid, sputum, sweat, vomitus, nasal secretion, saliva, faeces, tears, urine and non-intact skin.

What pathogens: There are ranges of pathogen that standard precautions are necessary which include viruses -HIV, HBV, HCV, Yellow fever, Dengue Virus, Lassa Fever virus, Crimean Congo Virus etc; Prion diseases (e.g., Creutzfeldt-Jakob disease; diseases with air-borne transmission e.g., tuberculosis, SARS, infection associated with droplet transmission (e.g., mumps, rubella, influenza, pertussis); transmission by direct or indirect contact with dried skin (e.g., colonization with MRSA) or contaminated surfaces or any combination of the above.

Who are at risk and risk factors: All healthcare personnel (HCP) who are persons, paid and unpaid, working in healthcare setting who have the potential for exposure to patients or to infectious material including body substances contained medical supplies and equipment, contaminated environment surfaces, or aerosols generated during certain medical procedure. In essence all Health Care personnel are at risk and this include Physicians, Dentists, Nurses, Midwives, Hospital attendants/Health attendants, other Dental personnel, Laboratory personnel and Pharmacists. ⁽¹⁾ The trainees /students of all professional groups are also included

especially those who usually as part of their training comes to clinical settings to acquire skills. In addition their patients are at risk.

The actions that confer greatest risk include cuts, scrapes, splashes of body fluids, sharps injuries from needlestick, lancet, etc. Other risk factors include Healthcare setting surfaces and aerosol, body fluid generating procedure.

Practicing Standard Precautions: Practicing Standard Precautions entails hand washing and hygiene, use of protective barriers, environmental control, handling and adequate discarding of sharp instruments including needles, patient's accommodation in accord to requirement levels as an infection transmission source, respiratory hygiene and cough etiquette. (1,3,32,33)

1. Hand washing and hygiene:

The hands are the most common vehicle for microbial transmission therefore hand washing reduces the number of potential infectious agents on the hands. (1,3,32,34) It also an important means of reducing the incidence of infectious agents in healthcare facilities. (34)

Proven Hand Washing comes with stepwise techniques, which involve using antiseptic soap or detergent, wash for 10-15 seconds all part of the hands with running water and soap. (6) In resource constraint environment, the hands should be washed while assistant pour water. This is a less standard practice.

Alternatively alcohol based agent can be used to disinfect the hands although should not be used on hands with dirt. After washing hands, usage of disposable towel or napkins if no automated electric drier.

Other essential guides include washing of hands immediately when contaminated with blood and body fluids. Such does not preclude washing hands even if worn gloves are removed and was intact.

It is not proven that hand sanitizer does not replace regular hand washing.

Hand washing includes before touching a patient, even if gloves will be worn. It is essential before exiting the patient's care area after touching the patient or the patient's immediate environment to also wash the hands with or without contact with blood, body fluids or excretions, or wound dressings. In additional it is an essential act prior to performing an aseptic task (e.g., placing an IV, preparing an injection).If hands will be moving from a contaminated-body site to a clean-body site during patient care. It is also recommended after glove removal.

2. Use of protective barriers/Personal Protective Device(PPE):

The usage of protective barriers/Personal Protective Device (PPE) reduces the risk of exposure of healthcare workers' skin or mucous membrane to blood and body fluid by creating a physical barrier. (1,3,6) These devices decrease the risk of exposure of the HCW's skin or mucous membrane to potential infective materials. Such protective barriers include barriers (e.g., gloves, gown, cap, mask, protective eye wears, and face shields); equipment and clothing used during care.

It is however not adequate to merely use the protective barrier, it is also important to take care to prevent injuries when using needles, scalpels and other sharp instruments. Always deploy such protective barrier as appropriate when there is a potential exposure and immediate thorough washing of hand & skin if contaminated with blood or body fluids. If there is exposure, standard post exposure prophylaxis (PEP) protocol should be followed.

The glove that can be used to achieve standard precaution maybe intact latex or intact vinyl glove and this is necessary during phlebotomy, procedures involving direct contact with blood or body

fluid and direct contact with non-intact skin and mucosal membrane which must be for single usage. Specifically, CDC guideline recommends the use of sterile gloves for procedures involving contact with normally sterile areas of the body and use of sterile gloves for procedures involving contact with mucous membrane, unless otherwise indicated and for patients care or diagnostic procedures that require the use of sterile gloves.

Aprons made of plastic should be worn during surgical procedure, cleaning and generally when body fluid or blood is anticipated.

A well-fitting goggle is essentially to safeguard the conjunctiva and this should be worn when there is risk of splash or spilling of blood or body fluids. Mask is meant to protect the nostrils and mouth.

It is not out of place for cuts and abrasions on healthcare professional to be covered with waterproof dressing.

3. Environmental control:

Environmental control involves surface processing protocols and health service waste handling and cleaning. ⁽¹⁾ The surface processing protocol involves assumption that work surfaces including bed, bed railings, patient examination tables and bedside tables are contaminated therefore routinely cleaned. It is also necessary that work surface should be disinfected before procedure, when contamination is suspected and after procedures or test.

The health service waste handling is also very important and it includes cleaning and disinfecting soiled linen and avoidances of contact with soiled linen with bare hands. Furthermore contagious patient should be preferably kept in isolation area or room especially in cases of Viral Haemorrhagic Diseases. Generally non sharp wastes are disposed in bio-hazard bag, small sharps for sharp disposal bags but larger ones in

canisters. All must be labeled as biohazard label.

4. Proper handling and adequate discarding of sharp instruments including needles:

Managing sharp instruments like hypodermic needles, scalpels, blades and biopsy needles is essential for standard precautions. ^(1,35) The use of safer devices like retractable lancets is being advocated. ⁽³⁵⁾ Other advocated disposition during sharps usage include not recapping needles after usage, disposal of sharps in containers (closable, puncture proof, leak proof, labeled color coded to indicate biohazard and generally, minimize invasive procedure to avoid accidental injury. The risk of needle pricks commonly occurs during recapping, disassembly and inappropriate disposal. Standard recommendations for finger-stick injury should be followed. In case of accidental needle prick immediate effort is to make to follow Post Exposure Prophylaxis (PEP) protocol.

5. Patient's accommodation in accord to requirement levels as an infection transmission source:

There are well developed protocols for specific disease. ⁽³⁶⁾ Adherence would go a long way in preventing infection.

6. Respiratory hygiene and cough etiquette:

This involves covering mouth and nose when coughing or sneezing, hand hygiene after contact with respiratory secretions and spatial separation of persons with acute febrile respiratory symptoms. In setting of Viral Haemorrhagic Fever, N95 or P3 respirator may be necessary. ⁽¹⁾

Generally standard precautions must be taken consistently with all patients – regardless of their diagnosis in all work practices at all times involving basic hand hygiene, respiratory hygiene, usage of personal protective equipment (according to risk of splashes or other contact with

infected materials) and safe injection practices.

RECOMMENDATIONS

The followings are recommended:

1. Strict and regular adherence to standard Precaution at all times to reduce adverse outcome in healthcare setting.
2. Routine training for all HealthCare Workers is essential to infuse the knowledge of standard precaution and reinforce same in all health workers.
3. Administrative reporting channels should be developed and constantly reviewed.
4. Regular monitoring and enforcement of potential exposure.
5. Availability of post exposure prophylaxis and protocol is advocated in all clinical setting. There must institution wide information about availability of such.
6. Mechanism for reporting in healthcare setting is also very important especially through staff clinic to encourage utility.
7. Institute policy of reporting of accidental and potential exposure.
8. Create awareness about reporting procedure in case of potential exposure.
9. Training and retraining of healthcare workers.
10. The reduction of waiting time by health workers for post exposure prophylaxis.

CONCLUSION

The article discussed the definition of standard precaution. The historical evolution of the concept was expounded. Some pathogen healthcare workers highlighted with common procedures and body fluid and substances that standard precaution was discussed. There was also discussion of the component of standard precaution.

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How to cite this article: Adebayo O, Labiran A, Imarhiagbe L. Standard precautions in clinical practices: a review. *Int J Health Sci Res.* 2015; 5(9):521-528.
