

ESSENTIAL OF ASEPTIC TECHNIQUE AS INFECTION RISK REDUCTION PRACTICES IN SCHOOL AND COMMUNITY HEALTH CARE SERVICES

¹Ogunmola, P.O and ²Moronkola, O.A

¹Primary Health Care Services Unit, Oyo East Health Care Board, Oyo State

²Dept. of Health Education, Faculty of Education, University of Ibadan, Ibadan.

Abstract

Over the past few decades, the world had seen increase outbreaks of diseases that were once better controlled. Previously unidentified infectious agent that can cause incurable diseases such as HIV, COVID-19 and hepatitis had become a significant cause of illness and death in many part of the world. The school and community health care services are not exempted because infections can spread anywhere health care services are being rendered, and without proper precaution known as aseptic technique, the health facility can cause the spread of infections and diseases known as infections acquired in the hospital (hospital acquired infections), this are a continuous problem everywhere in the world. Therefore when providing health services, it is essentialfor health workers to prevent the spread of infection at all times, whether in the school or during community health care services provision. This paper therefore focus on how to ensure infection risk reduction practices through measures known as aseptic technique anywhere, any place health care services is being rendered.

Keywords: Aseptic technique, hospital acquired infections, school and community health services

Introduction

Infections are caused by micro-organisms and this resides anywhere living things around .When human beings are infected by micro organisms which leads to infection or disease the next point of call is anywhere or any place where health care services are rendered. This calls for infection prevention and control on the part of the health workers so that patient will not acquire new infections on admission and the health workers themselves will not be infected while discharging their duties. Health care providers are prone to infections due to the nature of services they provide to people and during the course of providing these services, many had been infected with one infection or the other known as Healthcare Associated Infections (HAIs), leading to morbidity and mortality in the course of caring for people with illness and infections and this infections can be spread if proper asepsis is not maintained and established. It is of utmost importance that healthcare workers take necessary precaution to ensure that they are not exposed to infectious agents while discharging their duties.

Studies by National Health and Medical Research Council (NHMRC) (2010); Bataduwaarachchi, Balasubramaniam, Balasooriyaand Senerath(2011)

and Ariyanrathne, Gunasekara, Weerasekara, Kottahachchi, Kudavidanage and Fernando (2013) noted that effective infection prevention can lower the prevalence of HAIs, though the details of aseptic technique as an effective infection prevention vary from one health care to the other but they are similar in principle and practices. In developing countries, HAIs prevalence is found to be as high as 19%. Previous studies have shown that at least 40% of primary bacteraemias patients in intensive care unit are associated with intravascular catheters inserted without proper aseptic technique [World Health Organization, (WHO), 2010]. Trampuz and Widmer (2004), stated that health care associated infections due to poor hand hygiene had been linked to an unacceptably high level of morbidity, mortality and health care cost, which makes HAIs the most common complications affecting patients in hospital. However, the problem does not just affect patients and workers in the hospitals, HAIs can occur in any health care setting, including office based practices (e.g. general practices, clinics, school clinics and dental clinics) and long term health care facilities (NHMRC,2010).

Health care workers are the foundation of health systems and the driving force to achieving universal health coverage and global health security, their commitment and professionalism throughout the COVID-19 pandemic are evident to all, extraordinary people, performing extraordinary work. However, too many of them have become infected, ill or died as a result of COVID-19. WHO (2021) estimates that between 80 000 and 180 000 health and care workers could have died from COVID-19 in the period between January 2020 to May 2021, converging to a medium scenario of 115 500 deaths. These deaths are a tragic loss and an irreplaceable gap in the world's pandemic response. Encouragingly, the reported rate of infections and deaths among health and care workers has reduced over time: but the world cannot be complacent. More work is needed to minimize the risk of infection in the workplace (WHO, 2021).

Infection in Health Care Settings

Health care setting is any setting where health care services is rendered, be it in the school environment, clinics, dental clinics, maternity homes and hospitals in the community to mention a few . Infection in health care setting is known as nosocomial infection also referred to as hospital acquired infections or healthcare associated infections (HAIs). These are infections that are not present in the patient at the time of admission to hospital but develop during the course of stay in the hospital (Okonufua, Okpokunu, Aigbogun, Nwandu, Mokwenye, Kangwu, Hussein , 2012 and Osazuwa, Azodo, Ehizele, Obuchwe, 2012). Infectious agents are biological agents, which cause diseases or illness to their hosts. Many infectious agents are present in health care settings. Patients and health care workers are the most likely sources of infectious agents and are also the most common susceptible hosts. Also other people visiting and working in health care may also be at risk of both infection and transmission. These unanticipated infections develop during the

course of health care treatment result in significant patient illnesses and deaths (morbidity& mortality); prolong the durations of hospital stays and necessitate additional diagnostic and therapeutic interventions, which generate added costs to those already incurred by the patients underlying disease (NHMRC, 2010; Uneke,Ndukwe, Oyibo, Nwakpu, Nnabu, and Prasopa-plaizier, 2013)

NHMRC, (2010) identified three main elements required for infection to occur which are, a source of the infection agent, a mode of transmission and susceptible host. This is known as the chain of infection and the interruption of this cycle is a strategy to limit the spread of infection.HAls has become more common as medical care has grown more complex and patients have become more complicated and HAls is associated with significant morbidity mortality and cost. They are considered a serious problem in the health care services as they are common causes of illness. Currently between 5% - 10% of patient admitted to acute care hospital acquires at least one infection and over the last decades has increased in both the United State and Europe, (Hopman, Blok, Troelstra, Bunten, 2007).

Aseptic Technique

Aseptic technique is a set of principles that must be applied in different situations, to achieve reasonably best infection control that is relative to the work and circumstances presented. It is a spectrum or continuum of techniques, which must be chosen from to perform infection control within the health system and it is a procedure used by medical staff to prevent the spread of infection. Aseptic technique refers to the procedure used to avoid the introduction of pathogenic organisms into a vulnerable body site or invasive device. The principle aim of an aseptic technique is to protect the patient from contamination by pathogenic organisms during medical and nursing procedures [National Health Services (NHS), 2018].It can be applied in any clinical setting since infection may be introduced to the patients through contact with pathogens in the environment, personnel or equipment. Proper aseptic technique is one of the most fundamental and essential principles of infection control in the clinical and surgical settings. The word ‘aseptic’ is defined as ‘without micro organisms’ and aseptic technique refers to specific practices, which reduces the risk of post-surgical infection in patients, by decreasing the likely hood that infectious agents will invade body during clinical procedures. These practices are also designed to help the health worker avoid been exposed to blood, body fluids, tissues and Other Potentially Infections Materials (OPIM) during surgical and clinical procedures (WHO, 2009).

Types and Principles of Aseptic Techniques

There are two types of aseptic technique

- i. Surgical Aseptic Technique
- ii. Medical Aseptic Technique

Surgical aseptic technique – The CDC (2010) estimated that over 27 million surgical procedures are performed in the United States each year. Surgical site infections are the third most common hospital acquired infections and are responsible for longer hospital stays and increased cost to the patient and hospitals. The aseptic technique strictly applied in the operating room is the surgical asepsis because of the direct and often extensive disruption of skin and unclearly tissue. This includes Hand washing, surgical scrub, gowning and donning of gloves. Link (2019) stated that proper hand washing can be the most single most important measure to reduce the spread of microorganism, proper hand washing involves removal of jewelry avoidance of close contact with the sink and a minimum of 10-15 seconds of hand scrubbing with soap, warm water and vigorous friction.

Other Clinical Settings

In other clinical settings apart from the operating room, observation of medical aseptic practices will help to prevent hospital acquired infections. Clinical areas outside the operating rooms generally do not allow for some strict level of asepsis, avoiding potential infections remains the goal in every clinical settings. The application of aseptic technique in this setting is termed medical asepsis or clean technique rather than surgical asepsis or sterile technique required in the operating rooms. Specific situations outside of the operating room as identified by NHS (2018), that required strict application of aseptic technique include; wound care ,drain removal or drain care, intravascular procedures, vaginal examinations during labour insertion of urinary catheters and respirator

The isolation unit as identified by Link (2019) is another clinical setting that requires a high level of attention to aseptic technique. The severely immuno compromised patient is placed in reverse isolation, where the goal is to avoid introducing any microorganisms to the patient. In cases like this aseptic technique is very important to avoid spread of infection in the hospital or injury to the patient unprotected by sufficient immune defenses. Entry and exit from the isolation unit involved careful hand washing, use of protective barriers like gowns, gloves and care not to introduce or remove potentially contaminated items. Link (2019) identified hand washing, wearing proper personal protective equipment (P.P.E), proper gloving, surgical prep as related actions that support aseptic technique.

Standard Precaution Practices

Standard principles according to Department of Health [DH, 2007] & CDC (2012) provide guidance on infection control precautions that should be applied by all health care workers to the care of all hospital in-patients all the time. These recommendations are not detailed procedural protocol and need to be incorporated into local guidelines. They are divided into four distinct intervention.

- i. Hospital environmental hygiene
- ii. Hand hygiene

- iii. The use of personal protective equipment
- iv. The use and disposal of sharps

Hospital environmental hygiene

Good hospital hygiene is an integral and important component of a strategy for preventing hospital – acquired infection. The hospital hygiene involves wide range of routine activities considered to be central to the prevention of HALs. (DH, 2007). They include: Cleaning and decontamination, laundry and housekeeping, safe collection and disposal of general and clinical waste, kitchen and food hygiene. The hospital must be visibly clean, free from dust and soilage and acceptable to patients, their visitors and staff (DH, 2007).

Hand Hygiene

Hand washing is one of the most important precaution measures against transmission or contamination of infections by health workers. The transmission of microorganisms from one patient to another via hands or from hands that have become contaminated from the environment can result in adverse outcomes. Primary exogenous infections are a direct clinical threat where microorganisms are introduced into susceptible sites such as surgical wounds, intravascular cannulation sites or catheter drainage systems. Secondary endogenous infection creates an indirect clinical threat where potential pathogens transmitted by the hands establish themselves as temporary or permanent colonizers of the patient and subsequently causes infection at susceptible sites, (WHO, 2007; Health Protection Agency,2012; CDC, 2007).

The use of Personal Protective Equipment

Personal protective equipment (PPE) is specialized clothing or equipment worn by an employee for protection against infectious materials (CDC, 2010) .The protection of healthcare personnel from infection disease exposure in the workplace requires a combination of controls, one of which is the use of PPE. PPE listed below prevent contact with the infections agent or body fluid that may contain the infectious agent by creating a barrier between the worker and the infections materials. Gloves protect the hand, gown or apron protect the skin and clothing masks and respirator protect the mouth and the nose, goggles protects the eyes and face shield protects the entire face (CDC, 2010).

School health service and Aseptic Technique

Moronkola (2017) submitted that school health service is a component of school health programme that provides preventive and curative health care for the school population. The magnitude of the services to be provided, will depend on several factors like school location, government policy, learners and staff population, level of education to be catered for , whether non, some or all school community

members live within or outside the school premises. The Federal Ministry of Education (2006) was of the opinion that as an essential component of effective school health programme, school health services ensures that children are healthy as well as able to learn all the times. The school health services are provided by physicians, dentists, school health nurses, teachers and other relevant personnel to appraise, protect, and promote the health of members of school community.

School health services (SHS), according to WHO (2021), are services provided by a health worker to students enrolled in primary or secondary education, either within school premises or in a health service situated outside the school. Most countries have some form of SHS, but many such programmes currently are not evidence-based, are not well implemented, are underfunded and/or are delivered with limited reach and scope. In all WHO regions, school-age children and adolescents (those aged 5–19 years) experience a range of largely preventable health problems, including unintentional injury, interpersonal violence, sexual and reproductive health issues, communicable diseases, non-communicable diseases and mental health issues. In addition, school-age children and adolescents have positive physical, sexual, psychosocial and neurocognitive health and development needs as they progress from childhood to adulthood. The need for quality health care for 5–19-year-olds is great, but globally the quality of health services for them are variable and coverage is limited, schools offer a unique opportunity to implement effective health services for children and adolescents. In the schools environmental hygiene, hand hygiene, food hygiene for those in the boarding house, the food vendor screening for the day schools are of utmost importance, with the onset of COVID-19, social distancing, handwashing materials and equipment should be placed in strategic places in the school environment, wearing of face mask should be encouraged. The health worker or personnel in school clinic or sick bay should practice proper asepsis and makes use of standard precautions within and outside the school clinics to prevent transmission of infection (WHO, 2021).

Community health care services

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Community health services play a key role in keeping people well, treating and managing acute illness and long-term conditions, and supporting people to live independently in their own homes (Kingsfund, 2019). NHS confederation (2021) opined that community health services focus on health promotion, a disease prevention and management, which are designed to improve the health and wellbeing of local residents, as well as take pressure off the acute care health system, Tulane university (2021) opined that community services are central to plans for the future of the health and care system and typical services include:

- i. Preventive and primary care services (including medical and dental checkups and condition management)
- ii. Disease prevention (vaccinations, anti-smoking programs, and obesity screenings)
- iii. Patient education (nutritional counseling, injury prevention, and disease information)
- iv. Mental health services (screenings and counseling)
- v. Substance abuse treatment

By providing comprehensive preventive care and helping patients monitor chronic conditions, health workers working at community health centres at the primary health care levels need to be able to identify risk in the work place and put in place the appropriate aseptic technique to prevent transmission of infection in the health center level. Risk management is a process consisting of a well defined steps which when taken in sequence support better decision making by contributing to a greater insight into risk and their impacts. It is as much about identifying opportunity as is about avoiding loses. By adopting effective risk management techniques that can help improve safety and quality business performance (SAI Global, 2003). As health care setting vary greatly in their day to day function, it is not possible to provide a one size fit all approach to risk management, it is essential for health care workers to be able to identify, analyze the potential risk of transmission that can occur (NHRMC, 2010). The risk management identification in the clinical context as it applied to HAIs.

- i. Avoid the risk - The best way to manage a risk is to avoid it. It is valuable to consider the following before performing a procedure by asking oneself the following question,
 - a) is the planned task intervention necessary?
 - b) Are there alternative procedure that would eliminate or minimize potential exposure of the patient or yourself and others to infectious agent e.g. Can antibiotics be given orally rather than intravenously
- ii. Identify the risks- when approaching a clinical task or duty it is useful to considered the risk of HAIs transmission in term of when/ where/ why and how can they occur.

- iii Analyse Risk - The identified risk associated with the task /duty needs to be analyzed.
- iv. Evaluate risk - The next stage requires assessment of whether the level of risk is acceptable or not acceptable.
- v. Treat the risk- At this stage all the information gathered from the analysis and evaluate on the risk of HAIs transmission is brought together to consider what action should be taken (NHRMC, 2010).

Gadzama *et al.*, (2014), in a study in main referral hospital in northeastern Nigeria reported poor knowledge in the practices of injection safety, recapping of needles which is one of the practices that contributes to needle stick injury was commonly practiced by the respondents unsafe therapeutic injection practices, findings are also similar to the one reported from (Perz, *et al.*, 2010). In addition to increasing the potential for patients' infections, unsafe injection practices put providers themselves at the risk of needle stick injuries, effective hand hygiene can lower the prevalence of HAIs, Unfortunately, the prevalence of these infections, continues to rise and pose a challenge to healthcare providers (Ariyantne, *et al*, 2013). Previous studies have shown that hand hygiene compliance among healthcare workers is generally low (WHO, 2009). Furthermore, many studies carried out to assess the knowledge compliance and reason for non-adherence to hand hygiene guidelines found that compliance with hand hygiene protocols by healthcare workers (HCW) is poor (Kennedy and Burnett 2011) due to so many reasons like heavy work load, high number of clinical procedures and skin condition of HCW. A significant difference was observed between medical and nursing students who had received formal training in hand hygiene as reported by Ariyantne *et al.* (2013). He further reported that the nursing staff with less than five years of experience, the practice of aseptic precaution was significantly better compared to group who had more experience hence the need for continuous training and practices.

Conclusion

Aseptic techniques is imperative in health care delivery, this is to reduce the risk of infections to the health worker, as well as to the patient/client, thereby preventing the spread of infections in the community. Continuous education for health workers on the benefits of using aseptic techniques is advocate. This may lead to reduction of hospital acquired infections thereby leading to reduction in morbidity and mortality among health care workers. The adverse effects of non-compliance to aseptic techniques are preventable therefore health workers working at the school clinics or the community health centers should make effort, to address this factor through practice and policy. The effort by government, health parastatal and stakeholders in health will go a long way to reduce hospital acquired infections thereby promoting good health condition for both patients and health worker. Aseptic technique education should be used by health teachers, health agency,

researchers as well as those involve in infection control practices to improve adequate use of aseptic technique by health care workers in health care settings.

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