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Using gloves in medical procedures at Badeen hospital

Author: Naba Mahdi Sheikh Musa Ahmed, a medical student at Sudan University of science and technology, from Sudan, Northern state, Dongola city,
Email: nabamahady@gmail.com

Abstract

Background: Using gloves is very important during any medical procedure to insure safety of patients, nurses and doctors from contaminated blood or needles or any body secretions, and to reduce healthcare associated infections.

Methods: cross sectional study at the patients at Badeen hospital who undergo peripheral canulation and blood sample analysis at laboratory from 2nd January to 30th January 2025.

Results: all patients at Badeen hospital from 2nd of January till before 30th of January who underwent peripheral canulation, blood sample taking at laboratory and small surgical procedures, all these done without using any gloves, and sometimes one glove was used during highly infectious small surgical procedures as dressing a diabetic septic foot.

Conclusion: non sterile gloves must be used during any medical procedure to provide the highest degree of safety for patients and for who doing the procedure, and to reduce the percentage of healthcare associated infections.

Key words: non sterile gloves, medical procedures, safety, infections, healthcare workers

Introduction :

The use of gloves in medical procedures is a critical component of infection control and patient safety. Importance of gloves in medical procedures are in:

1. Infection Control

- **Barrier Protection:** Gloves provide a physical barrier between healthcare providers and patients, preventing the transmission of pathogens. They protect both the healthcare worker from exposure to infectious materials and the patient from potential contamination.
- **Prevention of Cross-Contamination:** During medical procedures, healthcare workers may come into contact with blood, bodily fluids, and other potentially infectious materials. Gloves help prevent the transfer of these substances from one patient to another or from surfaces to patients.

2. Protection for Healthcare Workers

- **Reducing Occupational Hazards:** Healthcare workers are at risk of exposure to bloodborne

pathogens (e.g., HIV, Hepatitis B and C) and other infectious agents. Wearing gloves significantly reduces this risk, contributing to a safer work environment.

- **Minimizing Skin Contact:** Gloves protect the skin from harmful chemicals, irritants, and allergens that may be present during certain procedures, such as handling hazardous drugs or disinfectants.

3. Compliance with Standards and Regulations

- **Adherence to Guidelines:** Various health organizations, including the Centers for Disease Control and Prevention (CDC) and the World Health Organization (WHO), recommend glove use as part of standard precautions in healthcare settings. Compliance with these guidelines is essential for maintaining accreditation and ensuring quality care.

- **Legal and Ethical Responsibility:** Healthcare providers have a legal and ethical obligation to minimize risks to patients and themselves. Using gloves is a fundamental part of meeting these responsibilities.

4. Promoting Patient Safety

- **Reducing Infections:** The use of gloves during invasive procedures (e.g., surgeries, catheter insertions) helps reduce the risk of healthcare-associated infections (HAIs), which can lead to serious complications and increased healthcare costs.

- **Enhancing Trust:** Patients are more likely to feel safe and cared for when they see healthcare providers adhering to infection control practices, including wearing gloves. This can enhance the patient-provider relationship.

5. Variety of Procedures

- **Different Types of Gloves:** Different procedures may require specific types of gloves (e.g., sterile gloves for surgical procedures, non-sterile gloves for routine examinations). Understanding when and how to use different types of gloves is essential for effective infection control.

- **Special Situations:** In certain scenarios, such as handling chemotherapy agents or working with patients who have highly contagious diseases, specialized gloves (e.g., nitrile or latex) may be necessary to provide adequate protection.

6. Environmental Considerations

- **Sustainable Practices:** The increasing awareness of environmental issues has prompted discussions about glove disposal and recycling. Healthcare facilities are encouraged to adopt practices that balance safety with environmental responsibility.

The hands of healthcare workers become contaminated with pathogens and the risk of contamination increases linearly with time on hands during patient care, therefore cross transmission of microorganisms by the hands of healthcare workers is considered to be the most likely means of transmission of hospital acquired infections, this risk can be minimized

through washing hands and use of gloves. Gloves should be worn for invasive procedures, any contact with sterile sites, non - intact skin, mucous membranes, and exposure to blood, all other body fluids, and sharp or contaminated instruments, however, gloves do not provide complete protection against hand contamination, bacterial flora from patients was found on the hands of up to 60% of healthcare workers who had worn gloves during patient contact [1].

The invasive nature of surgery, with it's increased exposure to blood, means that during surgery there is high risk of transfer of pathogens, wearing two pairs of surgical gloves, as opposed to one pair, is considered to provide an additional barrier and further reduce the risk of contamination [3].

Current guidelines require hand hygiene before donning nonsterile gloves, but evidence to support this requirement is lacking [2].

Inclusion criteria:

Types of participants:

Healthcare workers

Types of intervention:

Gloves using intervention.

Types of outcomes:

Contamination of nurse's hands, transmission of infections, adherence to glove usage.

Methods:

cross sectional study at the patients at Badeen hospital who undergo peripheral canulation and blood sample analysis at laboratory from 2nd January to 30th January 2025, first observation and education was done in second of January 2025, the second cycle was done after a week, finding not response, the third cycle was done in 30th of January showing a response of using gloves during peripheral canulation, blood sample taking and small surgical procedures.

Results:

All patients at Badeen hospital from 2nd of January till 30th of January who underwent peripheral canulation blood sample taking at laboratory and small surgical procedures, all procedures done from 2nd of January till before 30th of January were done without using any gloves, except some highly infectious procedures such as dressing a diabetic septic foot, which done by using only one glove. A result from a literature review including twenty- three studies found that contamination of healthcare worker's gloves with bacteria during routine care activities is common, but the protection afford by the gloves was incomplete adherence to gloves utilization among healthcare workers was suboptimal, gloves are overused and often misused, the major break in compliance with glove use was failure to change gloves between procedures on the same patient [1].

Healthcare associated infections are common among healthcare workers who didn't use gloves during medical procedures, also it's a source of infection transmission to patients.

In a 2012 report by the Public Health Agency of Canada (PHAC), it was estimated that 5% to 10%

of patients hospitalized in Canada will develop healthcare associated infections [5].

Healthcare associated infections (nosocomial infections) are diseases that occur as a direct result of treatment on contact in a hospital or healthcare setting, or as a result of healthcare delivered in the community, or by patients, staff, or visitors and transmitted to others, these diseases include catheter associated urinary tract infections accounting for 19% of all healthcare associated infections, also infections associated with the use of intravascular access devices, more than 60% of blood stream infections are associated with intravascular devices and risk is higher with central catheters, associated microorganisms are staphylococcus aureus, staphylococcus epidermidis, methicillin resistant staphylococcus aureus, Candida species and Enterococci, also there are ventilator associated pneumonia affect up to 20% of patients admitted to intensive care unit, causative agents are pseudomonas aeruginosa, enterobacteriaceae, and staphylococcus aureus, also there are surgical site infections accounting for 5% of patients undergoing surgical procedures, contribute to more than one third of post-operative deaths, common organisms include staphylococcus aureus, streptococcus pyogenes and enterobacteriaceae when a surgery involves entry to a hollow viscera, also there are clostridium difficile infections, protection is made by hand hygiene, gloves wearing, making environment clean and safe and every procedure must be done according to the guidelines.

Because both examination and surgical gloves are made of latex, and some people have latex allergy, there are alternative gloves such as nitrile gloves, has higher failure rate in use and lower user satisfaction than latex gloves, latex is still considered superior with respect to barrier characteristics against transmissible diseases [8].

Healthcare workers generally use gloves for their own safety and sanitize hands before gloving for patient safety [4].

Studies of previously published articles showed that there are no differences in the rate of postoperative surgical site infections between outpatient surgical procedures performed with sterile vs nonsterile gloves [6].

Studies of previously published papers also showed that there is no evidence of additional protection against wound infection with the use of sterile gloves for wound repair in the emergency room compared to clean gloves [7].

According to World Health Organization, indications for gloves usage are:

- When there is a risk of exposure to blood, bodily fluids, or contaminated surfaces.
- When performing invasive procedures, handling sharp instruments, or caring for patients with infections.

Types of Gloves:

- **Sterile Gloves:** Used for surgical procedures and other tasks where sterility is required.
- **Non-sterile Gloves:** Used for routine patient care and handling of non-invasive equipment. Hand hygiene is very important also, it should be performed before putting on gloves and after removing them. This can include washing with soap and water or using an alcohol-based hand rub.

Proper gloves usage is very important to insure full benefit of it, gloves should be put on just before the procedure and removed immediately after the task is completed and Avoid touching surfaces or items that are not sterile while wearing gloves. And should be removed carefully to avoid contamination. The outside of the glove should not touch the skin or clothing.

Dispose of gloves in a designated waste container immediately after use is important to reduce risk of infection transmission.

Gloves are intended for single use only. Reusing gloves can lead to cross-contamination and increased risk of infection.

- Healthcare workers should receive training on the proper use of gloves, including when to wear them, how to put them on and take them off safely, and the importance of hand hygiene.
- Regular monitoring should be conducted to ensure compliance with glove use protocols and to reinforce the importance of adhering to guidelines.

Some key findings and insights from research on the use of gloves in medical settings:

1. Infection Control: Numerous studies have demonstrated that wearing gloves significantly reduces the risk of healthcare-associated infections (HAIs). Gloves act as a barrier between the healthcare provider's hands and potentially infectious materials, including blood, bodily fluids, and contaminated surfaces.

2. Types of Gloves: Research has explored various types of gloves, including latex, nitrile, and vinyl. Nitrile gloves are often preferred due to their resistance to punctures and chemicals, as well as their lower likelihood of causing allergic reactions compared to latex gloves.

3. Glove Use Compliance: Studies have shown that compliance with glove use protocols can be inconsistent among healthcare workers. Factors influencing compliance include the type of procedure, the perceived risk of exposure, and the availability of gloves. Educational interventions have been effective in improving compliance rates.

4. Double Gloving: In certain high-risk procedures, such as surgery, double gloving (wearing two pairs of gloves) has been shown to provide an additional layer of protection against glove perforation and contamination. Research indicates that double gloving can reduce the risk of exposure to bloodborne pathogens.

5. Glove Contamination: Research has highlighted that gloves can become contaminated during medical procedures, especially if they are not changed appropriately between tasks or patients. This emphasizes the importance of hand hygiene practices before and after glove use.

6. Glove Integrity: Studies have investigated the integrity of gloves during use, finding that factors such as duration of wear, type of procedure, and the presence of sharp instruments can increase the likelihood of glove failure. Regular training on proper glove use and monitoring can help mitigate these risks.

7. Environmental Impact: Recent research has also focused on the environmental impact of single-use gloves, leading to discussions about sustainable alternatives and practices in healthcare settings.

8. Patient Safety: The use of gloves is not only crucial for protecting healthcare workers but also plays a vital role in patient safety by minimizing the risk of cross-contamination during examinations and procedures.

Single use medical gloves are mainly serve to protect healthcare professionals and are only rarely meant to promote patient safety, a meta analysis found that wearing single use medical gloves can lower the risk of nosocomial infections (incidence rate ratio: 0.77 (0.67 ; 0.89). [10].

Gloves cannot be used for:

- routine intradermal, subcutaneous, and intramuscular injections.
- if the healthcare worker's skin is intact.
- if the patient's skin is intact. [9].

Discussion:

Because healthcare associated infections are commonly occurs, affecting patients who have been hospitalized, doctors and nurses, attention should be given for guidelines following by wearing gloves during any medical procedure, and washing hands before wearing, to maintain safety of all and to prevent infection transmission, so quality improvement projects must be done always at hospitals ,especially rural hospitals, to insure they are following the guidelines, then insuring health of patients and healthcare workers.

Conclusion:

The importance of wearing gloves appears clearly in prevention of transmission of infections healthcare workers to patients and vice-versa, and prevention of nosocomial infections that can be dangerous causing morbidity and mortality, so healthcare workers should follow guidelines in order to maintain safety and health of them selves and also of patients they take care about. There must be: **Education on Proper Use:** Training healthcare workers on the correct use of gloves—including donning, doffing, and disposal—is crucial for maximizing their protective benefits. Improper use can lead to increased risk of contamination.

• **Awareness of Limitations:** While gloves are an important protective measure, it is essential to understand that they do not eliminate all risks. Proper hand hygiene before and after glove use is equally important.

In summary, the use of gloves in medical procedures is vital for protecting both patients and healthcare workers from infections and other hazards. It plays a significant role in promoting patient safety, complying with health regulations, and fostering trust in the healthcare system. Proper training and adherence to protocols regarding glove use are essential components of effective infection control practices in any healthcare setting.

Declardation:

Ethical approval for this study and publication have been taken from medical director of Badeen hospital, data and materials for this study were available, no competing interest, no funding was found, the only author of this study Naba Mahdi Sheikh Musa Ahmed contributed for all of this study, acknowledgment to medical director of Badeen hospital and all nurses at this hospital for responding, the author Naba Mahdi Sheikh Musa Ahmed is a medical student at Sudan University of science and technology, from Sudan, which now struggled from a war.

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