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BAG Technique

Preventing and Controlling Infections in Home Care and Hospice

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The nursing bag has been used by home care visiting staff for decades to carry needed equipment and supplies to provide patient care in the home. The nursing bag is transported from patient home to home and may serve as a vehicle for transmitting microorganisms by virtue of the bag's contact with the staff's hands and contact with the patient's environment. This article establishes guidelines for the management of the nursing bag used by home care and hospice staff and offers strategies to prevent and control the transfer of microorganisms through its use.

Introduction

The nursing bag, also referred to as a healthcare bag, public health bag, medical bag, visiting bag, and supply bag, has been used by home care staff for decades to carry the needed equipment and supplies to provide patient care. For purposes of this article, the term *nursing bag* will be used; although it's not just used by nurses—the nursing bag is also used by visiting rehabilitation staff and aides. And how this bag has changed over the years, from the black leather nursing bag that was hand-carried by Lillian Wald making home visits in early 20th century in the Henry Street Settlement to the visiting staff of today wheeling a multicompartmental bag into the patient's home! Other types of bags that are brought into the home include hand-carried bags, bags with over-the-shoulder straps, rolling bags, fanny packs, and backpacks that contain everything from laptop computers to vital sign equipment. This article will help provide the framework to establish guidelines for the management of the nursing bag used by home care and hospice staff and offers strategies for preventing and controlling the transfer of microorganisms through its use (Figures 1 and 2).

Vector for Transmission

The nursing bag is transported from patient home to patient home and may serve as a vehicle for transmitting microorganisms, including multidrug-resistant

Figure 1. Vintage black leather nurse's bag.

Figure 2. Contemporary nurse's bag. Used with permission from Home Health Systems, Inc.

organisms (MDROs). This transfer of microorganisms occurs by virtue of the bag's contact with the staff's hands and the bag's contact with environmental surfaces in the patient's home. One study generated evidence that the nursing bag may serve as a reservoir for MDROs, indicating a potential risk for indirect transmission of microorganisms from one patient to another via a contaminated nurses' bag. In this study, nursing bags from four different home care agencies were cultured. It was found that approximately 84% of the outside of the bags cultured positive for human pathogens (15.9% MDROs) and 48.4% of the inside of the bags had positive cultures (6.3% MDROs). Although this study only described the existence of pathogens on the nursing bag, it is recognized that there is a potential risk for transmission of infection from one patient to another via contaminated nursing bags (Bakunas-Kenneley & Madigan, 2009).

Decontaminating and Cleaning the Surfaces of the Nursing Bag

The study by Bakunas-Kenneley and Madigan (2009) reinforces the need for decontaminating the bag to reduce its bioburden on its interior and exterior surfaces. The nursing bag should be cleaned on a "regular" basis to reduce the bacterial load in and on the nursing bag carried by staff during patient encounters. Minimally, the nursing bag and any carrying device, such as a laptop computer bag, that is carried or rolled into the patient's place of residence, should be cleaned when visibly soiled and on a regular basis. There are no standards or guidelines for the frequency in which the nursing bag should be cleaned. Each home care and hospice organization is required to define in policy the frequency within which the nursing bag is to be cleaned. It is suggested that minimally the bag be cleaned and decontaminated on a weekly basis with a maximum time frame of monthly and when visibly soiled. It is also suggested that if a monthly time frame is selected the timing of the bag cleaning procedure occur at the end of the month so that products and supplies that expire on the last day of the month can be disposed of and replaced. With use and over time, the bag will begin to appear worn from the wear and tear of making home visits. The bag should be replaced when it becomes worn and/or does not present with a clean, "professional" appearance.

Selecting Type of Nursing Bag Surface Material

When selecting a nursing bag to purchase for transporting patient-care equipment and supplies, if possible, select a bag that has an exterior surface material of a nonporous, noncloth/canvas/fabric material (e.g., vinyl or leather) for ease in cleaning and disinfecting the bag's exterior surfaces. Only a hard nonporous surface can be

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disinfected by wiping the surface, and that is why a vinyl material is recommended instead of cloth. Refer to Table 1 for the procedure for decontaminating and cleaning the nursing bag.

"Clean Side" Versus the "Dirty Side"

One of the myths regarding the home care bag is that there should be a designated "clean side" and "dirty side" of the nursing bag. The term "dirty" infers that there are items that are soiled that will be placed inside the bag. Nothing inside the bag should be "dirty" and, as such, there does not have to be a designated "clean" and "dirty" side of the bag. The only "dirty" item that may be in the staff's possession is regulated medical waste that was generated by the staff member (not the patient or caregiver), such as sharps and medical waste stored inside a red biohazard bag. An "in-use" sharps container (i.e., a sharps container with used needles inside that is not beyond 2/3 full) may be hand-carried into the home or may be stored in an exterior compartment of the nursing bag, if one is available, but not stored in the *inside* the nursing bag.

What's In Your Nursing Bag?

The content of the nursing bag can be broken down into two components, single-use items and reusable items. Single-use items are those items that will be removed from the nursing bag and not placed back into the bag after use. Examples of single-use items that may be found in a nursing bag include, but are not limited to individually packaged disinfectant wipes, alcohol prep pads, wound care dressing supplies, paper drying materials to use after washing the hands with soap and water, and personal protective equipment (PPE). Minimal quantities of PPE should be stored inside the nursing bag in the event that it is needed (e.g., one gown, face mask, a face shield in lieu of bulky goggles). The staff should not have to go out to the trunk of their vehicle to obtain the needed PPE, especially if the staff are expected to perform cardiopulmonary resuscitation as a component of their job duties and responsibilities and a pocket mask is needed. Reusable items are items that will be replaced back into the nursing bag after use. Examples of reusable items include equipment needed to obtain the patient's vital signs and bandage scissors.

When to Clean the Patient-Care Equipment Inside the Nursing Bag

Are there items inside the bag that may be potentially contaminated with pathogens? Yes. In the same study by Bakunas-Kenneley and Madigan (2009), they found that 43.7% of the patient-care equipment inside the nursing bags was contaminated with human pathogens (5.6% MDROs). This leads to the reason why the reusable equipment used after patient care *should* be, but does not have to be, cleaned before placing the equipment back into the nursing bag and visiting another patient. The Centers for Disease Control and Prevention's (CDC) *Guideline for Disinfection and Sterilization in Healthcare Facilities* suggests that at a minimum, noncritical patient-care devices (e.g., blood pressure cuff, stethoscope) be disinfected when visibly soiled and on a regular basis (Rutala et al., 2008). The phrase *a regular basis* is expected to be defined in policy by each home care or hospice organization. Examples of how a regular basis may be defined when care is provided in the home setting include:

Table 1. Procedure for Decontaminating and Cleaning the Nursing Bag

1. Select a large surface area that is suitable for cleaning and disinfecting (i.e., nonwood surface) the interior and exterior of the bag and emptying the bag's contents.
2. Clean and disinfect the selected surface with a disinfectant and allow the surface to remain wet for the contact time recommended by the manufacturer for a low-level disinfection.
3. Place the nursing bag on the cleaned surface.
4. Remove all contents from the interior of the bag and place the contents on the cleaned surface.
5. Turn the bag upside down and shake the bag to remove any loose contents in a trash container.
6. Visually inspect the interior and exterior of the bag for tears, cracks, and excess wear, and replace the bag as needed.
7. Hand wipe the nursing bag's interior surfaces with a "moist" disinfectant wipe wearing gloves (if recommended by the manufacturer) to remove any surface dirt adhering to the interior of the bag. Allow the bag's interior surfaces to remain wet for the contact time recommended by the manufacturer for a low-level disinfection.
8. Remove any surface dirt adhering to the exterior of the nursing bag by:
   a. Hand wiping the rolling or hand-carried bag's exterior surfaces with a "moist" disinfectant wipe for the contact time recommended by the manufacturer for low-level disinfection; *or*
   b. Machine washing the hand-carried bag (i.e., duffel-style bag) in a washing machine and drying in a dryer or allowing it to air dry.
9. Clean and disinfect the vital sign equipment (i.e., stethoscope, thermometer, pulse oximeter, sphygmomanometer) and electronic equipment used during patient care (i.e., laptop computer, cell phone). Allow the surface to remain wet for the contact time recommended by the manufacturer for a low-level disinfection.
10. Remove the gloves and perform hand hygiene.
11. Check the expiration dates on all medical supplies, blood tubes, and hand hygiene products, and discard as needed. Replace the supplies back into the cleaned nursing bag.
12. Check the supply stock to assure that all necessary equipment, supplies, and hand hygiene products are available and restock the bag's contents as needed.
13. Replace vital sign equipment into the nursing bag.

- after each use on a patient and before placing in the nursing bag;
- daily, during the last visit; or
- weekly.

Noncritical, reusable patient-care devices must be cleaned and disinfected before being placed back into the nursing bag and/or used on another patient if:

- the noncritical item is visibly soiled;
- the patient is on contact precautions; or
- the patient is known to be infected or colonized with a MDRO or *Clostridium difficile* (McGoldrick, 2014a).

When a patient is known to be infected or colonized with a MDRO or *C. difficile*, or is on contact precautions, disposable, single-patient use supplies may be purchased and left in the home for staff's use during patient care. As an alternative, the noncritical patient-care equipment (reusable/nondisposables) can be left in the home with the patient for their (sole) use. This is also called having *dedicated equipment.* When the patient is discharged, the equipment may be either given to the patient/family to keep or may be picked up during the last home visit, and cleaned and disinfected before using this equipment on another patient.

Preventing Transmission Through "Bag Technique"

To prevent the transmission of microorganisms, a practice called "bag technique" is deployed by home care and hospice staff to minimize the spread of microorganisms. The practice of bag technique often varies between home care and hospice organizations and depends on the home care or hospice organization's policies, and the patient and home situation. In home care and hospice, there are no data that serve as evidence of a patient developing an infection from microorganisms brought into a patient's place of residence via a nursing bag. Although most home care and hospice organizations implement policies and procedures to prevent the transmission of microorganisms, the current approach is based on the CDC's *2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings* (Siegel et al., 2007), as well as other professional publications (Rhinehart & McGoldrick, 2006). As long as the principles of preventing the transfer of

Table 2. Bag Technique

1. Place the hand-carried bag on a clean, dry surface or keep the rolling bag on the floor.
2. Perform hand hygiene.
3. Remove the supplies from the bag and place them on a clean, dry surface or on a surface barrier as needed.
4. Do not reenter the bag with gloves on. Remove the gloves if worn, perform hand hygiene, and then reenter the bag.
5. Clean the equipment and supplies that had direct patient or environmental contact as needed.
6. Remove PPE if worn, and perform hand hygiene.

Note. PPE = personal protective equipment.

microorganisms are observed by staff, patient infections can be prevented. Refer to Table 2 for a suggested "Bag Technique" policy.

Surface Barrier Versus No Barrier

There has been a long-standing controversy in the home healthcare and hospice field over whether a surface barrier should be used under a nursing bag in the home. Depending on whom one asks, answers may vary. Table 3 contains a point–counterpoint summary of the arguments made by clinicians both for and against using a surface barrier under the nursing bag.

Home care and hospice organizations' policies range from not using any barrier to having requirements that staff routinely place a barrier beneath the nursing bag in the patient's home to prevent contaminating the surface of the nursing bag. Even if it is an organization's policy to not routinely use a barrier, a surface barrier may always be used at the staff member's discretion. A surface barrier should always be used if a rolling bag is transferred from the floor to another surface. In addition, a surface barrier should be used if a nursing bag is not taken into a home for any reason and items are temporarily removed from the nursing bag. These items removed from the bag should be placed on a barrier in the home.

Surface Barrier Material

When a surface barrier is used, it should be composed of a water-resistant material and used on a one-time basis. Materials such as newspaper and paper towels, should be *avoided* as this material can wick water and moisture from the environmental surface and transmit microorganisms to the exterior of the bag's surface. A list of items that may be used as a surface barrier are listed in Table 4.

Bag Placement in the Home

The nursing bag should be placed on a visibly clean, dry surface in the patient's environment. If there is no visibly clean, dry surface available, place a barrier under the bag or hang it on a doorknob or the back of a heavy chair. When a rolling bag is used, the bag should remain on the floor. The front flap of the rolling bag should be opened in a manner that does not permit the front flap to have direct contact with the floor. If a hand-carried bag is placed on a barrier on the floor or a rolling bag is used, the bag should be kept closed when there are pets, visible infestations of pests (e.g., roaches),

Table 3. The Great Home Care Debate: Barrier Versus No Barrier Under a Nursing Bag

Pros: Using a Barrier Is Required in the Home Because ...	Cons: Using a Barrier Is Not Required in the Home Because ...
• There is abundant evidence in the literature of survival rates of human pathogens on environmental surfaces ... and patients' homes are typically not routinely disinfected.	• The nursing bag is a noncritical item and will never have direct contact with the patient (although it may contain some critical or semicritical items). There have been no data to support evidence of transmission of organisms by a nursing bag in the home.
• It shows respect for the patient's personal property by not placing a potentially contaminated item directly on surfaces in his or her home.	• There are no regulatory requirements or evidence-based guidelines that require the use of a barrier.
• It is required by organizational policy.	• It is not required per organizational policy.

The staff should not have to go out to the trunk of their vehicle to obtain the needed personal protective equipment, especially if the staff are expected to perform cardiopulmonary resuscitation as a component of their job duties and responsibilities and a pocket mask is needed. Reusable items are items that will be replaced back into the nursing bag after use. Examples of reusable items include equipment needed to obtain the patient's vital signs and bandage scissors.

and young children (e.g., toddler and preschool age) present.

Bag Placement in the Vehicle

If there is a concern of a bed bug infestation in the home, the nursing bag should be placed in the vehicle inside a large plastic container with high sides (McGoldrick, 2014b). Bed bugs are notorious "hitchhikers" and can drop off of the nursing bag inside the vehicle. Once bed bugs are inside the vehicle, it may be difficult or impossible to remove them. Bed bugs move by crawling and will not be able to crawl out a plastic container with smooth sides and high surfaces. Otherwise, the nursing bag should be placed on a visibly clean, dry surface in the vehicle. If there are supplies that are not to be stored at temperature extremes (e.g., alcohol-based hand hygiene products, blood glucose meter), and it is expected that these temperature extremes may be met during certain months of the year, the bag should be stored within the temperature-controlled section of the vehicle rather than the trunk (if applicable) (McGoldrick, 2014a).

Table 4. Suggested Surface Barriers to Use Under a Nursing Bag

- Plastic bag (tall kitchen size) on a roll
- Waterproof changing table liner
- Disposable underpads (chux)
- Wax paper
- Sheet pan liner
- Cafeteria tray liner
- Poly-backed towels

When Not to Bring the Nursing Bag in the Home

The nursing bag (either rolling or hand-carried) should not be taken into the patient's care area when:

1. The patient is known to be colonized or infected with a MDRO (e.g., MRSA) or *C. difficile*;
2. The patient is on contact precautions, in addition to standard precautions;
3. The home environment is infested with bed bugs or other pests;
4. The home environment is grossly contaminated with soil or excrement; or
5. It is the staff member's judgment. (McGoldrick, 2014a)

When the nursing bag is not brought into the patient's care area, the items needed for the patient encounter should be either hand-carried or placed in a disposable bag, with the disposable bag left in the patient's care area, and the equipment hand-carried out after being cleaned and disinfected (McGoldrick, 2014a).

Hand Hygiene

The nursing bag is considered a noncritical item and will never (under routine conditions) have direct contact with the patient's skin. What *will* have direct contact with the patient are the staff's hands. The most important infection prevention activity that the staff can deploy is performing hand hygiene. It is strongly recommended, but not required, that hand hygiene be performed before entering the nursing bag. It *is* required, based on the CDC *Guideline for Hand Hygiene in Health-care Settings*, that the staff perform hand hygiene before direct contact with the patient (CDC, 2002). Therefore, if the nurse

obtains supplies from the nursing bag to obtain a blood pressure, hand hygiene is required to be performed before direct contact with the patient. Hand hygiene is also required to be performed after contact with the intact patient's skin (e.g., when taking a pulse or blood pressure with equipment taken from the nursing bag) and after contact with inanimate objects in the immediate vicinity of the patient (e.g., the nursing bag). It is recommended that the products used to perform hand hygiene be stored in the nursing bag in an outer pocket that can be easily accessed.

A common error made by home care and hospice staff during patient care is that they will "forget" something from their nursing bag after they have begun patient care. For example, while providing a patient's care and wearing gloves, the staff will go back into the nursing bag (without removing the gloves and performing hand hygiene) and inadvertently contaminate the interior contents of the bag. This failure to remove the gloves and perform hand hygiene, not routinely performing hand hygiene before entering the nursing bag, and not routinely cleaning the patient-care equipment after use can contribute to the interior bag's contents becoming contaminated.

Summary

The bottom line is that the patient's home environment and the interior and exterior of the nursing bag may not always be as "clean" as they appear. Some have questioned, routinely using surface barriers between two noncritical surfaces, cleaning all noncritical equipment before returning them back to the inside of the nursing bag, and performing hand hygiene before entering the bag. Especially in light of the Bakunas-Kenneley and Madigan (2009) study confirming the presence of human pathogens on nursing bag's interior and exterior surfaces and on the equipment inside the bag, these are strategies to consider for implementation. Opportunities exist to conduct further research with a larger sample size to determine best practice to base home care and hospice patient-care activities on data. Until that data are available, these strategies are low-cost, low-tech, easy to implement, and can be deployed by home care staff to protect our immunocompromised home care and hospice patients—and keep them infection-free and where they most want to be: their home. ⌂

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