



Best Practices for

HOME CARE

The nursing bag has been used by home care visiting staff for decades as a means to transport patient care equipment and supplies to patients' homes.

For purposes of this article, the term "nursing bag" will be used, but it can also be referred to as a "medical bag," "public health bag," or "supply bag," as they are also used by physical therapists, occupational therapists, home healthcare and hospice aides, and physicians when making home visits. These supply bags can be back packs, "fanny packs," shoulder or hand-carried bags, and wheeled rolling bags that contain vital sign equipment, computer tablets, personal protective equipment, and other supplies needed to provide patient care. What's most important is not the configuration of the bag, but rather how it is managed. By virtue of the bag coming in contact with the staff's hands, the environment of the staff's vehicle and patients' homes (and ground surfaces when wheeled rolling bags are used), pathogenic microorganisms can be brought into the patient's home or transferred from one home to another. This article will establish guidelines for the management of the "nursing bag" used by home care and hospice clinicians, and offer best practice guidance and strategies to prevent and control the transfer of microorganisms through its use.

Preventing the Transmission of Pathogenic Microorganisms Through "Bag Technique"

To prevent the transmission of pathogenic microorganisms, a practice called "bag technique" is

implemented by home care and hospice clinicians, and the methods used will vary depending on the home care and hospice organization's policies, and the patient and their home environment. The principles of "Bag Technique" minimally include:

1. Hand hygiene
2. Bag placement
3. Bag placement during interim storage
4. Cleaning the interior and exterior surfaces of the bag
5. Maintenance of equipment and supplies stored in the bag
6. Management of equipment and supplies removed from the bag

Visually, the bag should always present with a clean "professional" appearance, and be replaced when any vinyl on the bag's trim surfaces crack, especially the handles, and when the bag appears worn from normal wear and tear.

This article will focus on principles 1 through 4. Principles 5 and 6 that address the maintenance and management of equipment and supplies are addressed in depth in several other publications (McGoldrick, 2015a, 2015b, 2016, 2017b).

Currently, there are no data that serve as evidence of a home care or hospice patient developing an infection from a pathogenic microorganism brought into a patient's home via a nursing bag. There is however, evidence that the bag may serve as a reservoir for multidrug-resistant organisms, thereby suggesting a potential risk for indirect transmission of microorganisms from one patient to another via a contaminated nurses' bag. Bakunas-Kenneley and Madigan cultured nursing bags from four different home care agencies and found 84% of the outside of the bags cultured positive for human pathogens (15.9% multidrug-resistant organisms) and 48.4% of the inside of the bags had positive cultures (6.3% multidrug-resistant

"BAG TECHNIQUE"

and the Use of Surface Barriers

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organisms) (Bakunas-Kenneley & Madigan, 2009). The presence of pathogens on the outside and inside surfaces of the nursing bag suggests the potential risk for transmission of infection from one patient to another via a contaminated nursing bag.

Reducing the Bioburden on Any Carrying Device Brought Into the Home

The Bakunas-Kenneley and Madigan study reinforces the need for decontaminating and cleaning the nursing bag on a “regular” basis. Currently, there are no evidence-based guidelines that define the frequency with which a nursing bag should be cleaned. Each home care and hospice organization needs to define in policy the frequency with which any carrying device, including the nursing bag, is to be cleaned. To reduce the bioburden, it is suggested that the interior and exterior of the bag be cleaned:

- anytime when visibly soiled; and
- minimally on a monthly basis when a surface barrier is routinely used under the bag; or
- minimally on a weekly basis for the exterior surfaces and monthly for the interior surfaces, when a surface barrier is *not* routinely placed under the bag (McGoldrick, 2017a).

These principles apply to any carrying device brought into the home, such as a tote bag used to

The ideal surface barrier material would be a water-resistant material used on a one-time basis and discarded as household waste in the home.

transport a scale to weigh the patient, or a laptop computer bag. When a monthly time frame is selected, this activity should occur close to the last day of the month to coincide with the date that medical supplies that expire in the same month will need to be disposed of and replaced. A tote or duffel-style bag can be washed in the washing machine and dried in the dryer on high heat for a full cycle (McGoldrick, 2017a). Visually, the bag should always present with a clean “professional” appearance, and be replaced when any vinyl on the bag’s trim surfaces crack, especially the handles, and when the bag appears worn from normal wear and tear.

Bag Surface Material

When choosing a bag to transport patient care equipment and supplies, select a bag that has an exterior surface material that is of a smooth, non-canvas nylon or polyester fabric, or vinyl material for ease in cleaning the bag’s exterior surfaces. Unlike a hard, nonporous surface that can be disinfected, the surface of the nursing bag can only be decontaminated and cleaned to reduce the number of pathogens.

“Clean Side” Versus the “Dirty Side” of the Bag

One of the long-held myths associated with the use of a nursing bag is that there should be a designated “clean side” and “dirty side” of the bag. The term “dirty” implies soiled items should be placed inside the bag. Nothing inside the bag should ever be “dirty” or soiled and as such, there should not need to be a designated “clean” and “dirty” side of the bag. All items in the bag should be visibly “clean” and the exterior surfaces of sterile supplies stored inside the bag should be “clean.” The only true “dirty” item that may be in the home care or hospice clinician’s possession during a home visit is regulated medical waste that was generated by the clinician (not the patient or their caregiver), such as sharps or medical waste (that would need to be stored inside a red biohazard bag). Red-bagged medical waste is rarely, if ever, generated during home visits. When it is, most commonly red-

bagged medical waste is generated during wound care. A red biohazard bag should always be hand carried out of the home (when the waste is generated by the home care or hospice clinician) for transport and final disposal, and should never be placed

inside the nursing bag. An “in-use” sharps container (i.e., a sharps container with used needles or other sharps 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 *inside* the nursing bag.

Bag Placement in the Home

A nonwheeled bag should be placed on a visibly clean, dry, flat surface in the patient’s environment, when available. If there is no visibly clean, dry, flat surface available, always place a barrier under the bag, or hang it on a doorknob or on a hangar over a door. If a hand-carried bag is placed

on a barrier on the floor, or a wheeled rolling bag is used, the bag should be kept closed when there are pets, there is a visible presence of pests (e.g., roaches), or young children (e.g., toddler and preschool age) are present.

When a wheeled rolling bag is used, the bag should remain on the floor. If the bag has a large front flap, it should be opened in a manner that does not permit the front flap to have direct contact with the floor. Some wheeled rolling bags that remain on the floor are heavily “front loaded” with supplies in the bag so that when the bag handle is fully retracted (i.e., pulled all the way up), the bag leans forward at such a steep angle that the front surface of the bag has direct contact with the floor. When this occurs, either a surface barrier needs to be placed under the bag, or some of the supplies need to be removed so the handle remains upright (at approximately a 90-degree angle) when fully retracted from the bag.

Floor Surfaces and the Risk of Transmission

Floor surfaces can be a reservoir for pathogenic organisms. Rashid et al. (2017) reviewed the literature for possible modes of transmission of pathogenic organisms from the floor to human contact and found methicillin-resistant *Staphylococcus aureus*, *Clostridium difficile*, and multidrug-resistant gram-negative species on the floor that were most likely transmitted via direct contact or aerosolization. Koganti et al. (2016) inoculated the floors in a patient’s room in a hospital with a nonpathogenic virus, and subsequently found the virus on the patient’s hands and high-touch surfaces in the patient’s room. More importantly, the virus was found on high-touch surfaces in adjacent rooms and at nursing stations, which suggests that floors could be a source for the dissemination of pathogens. Deshpande et al. (2017) found floors in patient rooms were frequently contaminated with healthcare-associated pathogens and demonstrated the potential for indirect transfer of pathogens to hands from fomites placed on the floor. This same mode of transmission can occur in the home environment. In these studies, the floor surfaces evaluated were in a healthcare setting where environmental services staff clean

When there is a concern of a bedbug infestation in the home, or the geographical area served by the home care or hospice organization has a higher endemic rate of bedbugs, the nursing bag should be placed in the vehicle inside a large plastic container with high sides.



and disinfect floor surfaces on a daily basis. In the typical home, it is not common practice to clean and disinfect floor surfaces daily, if at all depending on the patient and their house cleaning practices.

There is currently no research identifying the presence of pathogenic microorganisms on floors or other surfaces that bags may be placed on in the home, but it is likely that the surfaces in the patient’s care area in the home would have the highest burden of potentially pathogenic microorganisms. Even though the bag is a noncritical item and will never have direct contact with the patient, when the bag is placed directly on surfaces in the home without the use of a surface barrier under the bag, there is a risk that the bag will become contaminated with potentially pathogenic microorganisms which could then be transferred to the staff’s vehicle and to the next patient’s home.

A typical home healthcare or hospice clinician makes multiple visits per day bringing the bag’s external surfaces in contact with numerous patient homes throughout the week. It stands to reason that the patient or their caregivers could come in contact with these same environmental surfaces, and the microorganisms can be transferred directly to the patient, or indirectly via the caregivers’ hands. As a result, the patient can develop a healthcare-associated infection with an organism they may never have had contact with were it not for the nursing bag having contact with their environment. Thus, it is of prime importance to perform hand hygiene and clean the nursing bag to reduce the bioburden of pathogenic microorganisms on the external surfaces of the bag.



A common breach in infection prevention and control practice made by home care and hospice clinicians is reentering the bag while wearing gloves that had patient contact.

Surface Barrier Under the Bag and Supplies Versus No Barrier

There has been a long-standing controversy in the home healthcare and hospice field over whether a surface barrier should be placed under a bag and supplies when they are removed. There are no regulatory requirements or evidence-based guidelines to require placing a barrier under the bag or supplies removed from the bag. The purpose of using a surface barrier is to prevent contamination of the external surfaces of the bag and the contents removed from the bag. It is the home care and hospice organization's responsibility to define in policies and procedures if and when a surface barrier is required. Even if it is not an organization's policy to routinely use a surface barrier, it may always be used at the staff member's discretion.

A surface barrier should always be used when a wheeled bag is transferred from the floor to another surface in the home. 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 to bring into the home. When these items are removed from the bag, they should be placed on a barrier in the home. Lastly, using a barrier under the bag in the home shows respect for the patient's personal property by not placing a potentially contaminated item directly on surfaces in their home.

Anecdotally, over the past few years, there has been a shift in home care and hospice organizations using a barrier under their bag when it is a

nonwheeled bag. There is abundant evidence in the literature of extended survival rates of human pathogens on environmental surfaces (Huslage et al., 2013), and the recent data on the contamination rates of floor surfaces in healthcare facilities provide support for this practice. Patients are going home from acute care facilities colonized or infected with a multidrug-resistant organism or *C. difficile* and their homes often are not as well hygienically maintained with daily cleaning and disinfection, as is performed in a healthcare facility.

Surface Barrier Material and Size

Surface barrier materials can be either disposable, or reusable. The ideal surface barrier material would be a water-resistant material used on a one-time basis and discarded as household waste in the home. Disposable, one-time use surface barrier materials may include, but not be limited to: wax paper, plastic bag, cafeteria tray liner, sheet pan liner, waterproof changing table liner, disposable pads (Chux), or polybacked towels. Surface barrier materials of newspaper, paper towels, or paper hand drying material should be avoided, if possible, as water and moisture from the environmental surface may wick onto the bag and transmit microorganisms to the exterior of the bag's surface. As long as the surface is dry, using a nonwater-resistant material would be acceptable. When a surface barrier is selected, choose a size that will minimally protect the full bottom surface of the bag, and that the barrier's surface size is not smaller than the bottom surface size of the bag. Also, don't allow the shoulder straps to fall off of the barrier when used.

Reusable Surface Barriers

Reusable surface barriers are also available that have antimicrobial additives, such as Microban®, embedded into the barrier during the manufacturing process. Antimicrobial additive protection begins to work as soon as the microorganism comes into contact with the barrier's surface, and is effective against most common bacteria, yeasts, molds, and fungi that cause stains, odors, and product degradation. However, antimicrobial additive technology is *not* designed to protect users from disease-causing microorganisms. Antimicrobial additive technology is not a disinfectant and is not a substitute for normal cleaning practices (Microban International, 2017). Therefore, if an organization reuses a surface barrier with an antimicrobial additive, it should still be cleaned and

this adds to the equipment and supplies that the home care or hospice nurse will need to “manage.”

Bag Placement in the Vehicle

Nursing bags should be placed on a visibly clean, dry surface inside the vehicle. If there are supplies that are not to be stored at temperature extremes, as indicated by the product’s manufacturer (e.g., alcohol-based hand hygiene products, disinfectants, point-of-care testing supplies), 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 of the vehicle (McGoldrick, 2017a).

When there is a concern of a bedbug infestation in the home, or the geographical area served by the home care or hospice organization has a higher endemic rate of bedbugs, the nursing bag should be placed in the vehicle inside a large plastic container with high sides (McGoldrick, 2017b). Bedbugs are notorious “hitchhikers” and when a surface barrier is not used, the bedbug can drop off the nursing bag inside the vehicle. Once bedbugs are inside the vehicle, it may be difficult or impossible to remove them. Bedbugs move by crawling and will not be able to crawl out a plastic container with smooth, high sides.

When Not to Bring the Nursing Bag in the Home

The nursing bag should not be taken into the patient’s care area when:

1. The patient is known to be colonized or infected with a multidrug-resistant organism (e.g., methicillin-resistant *S. aureus* or *C. difficile*), or
2. The patient is on transmission-based precautions, in addition to Standard Precautions, or
3. The home environment is infested with bedbugs or other pests, or
4. The home environment is grossly contaminated with human or pet excrement, or
5. It is the staff member’s judgment. (McGoldrick, 2017a)

When the nursing bag is not brought into the patient’s care area, the items needed for the patient encounter should be placed in a disposable double bag, with the outer disposable bag left in the patient’s care area, and the equipment carried out after being cleaned and disinfected in the inner disposable bag (McGoldrick, 2017a).

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 the staff can deploy when implementing “bag technique” is performing hand hygiene. It is strongly suggested, but not required, that hand hygiene be performed before entering the nursing bag. It is required based on the Centers for Disease Control and Prevention (CDC) *Guideline for Hand Hygiene in Health-Care Settings* that the staff perform hand hygiene prior to direct contact with the patient (CDC, 2002). Therefore, if the clinician removes supplies from the nursing bag to obtain a patient’s vital signs, hand hygiene is 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).

The interior of the bag can become contaminated when hand hygiene is not routinely performed prior to entering the nursing bag, and the used patient care equipment is not cleaned before being placed back in the bag. A common breach in infection prevention and control practice made by home care and hospice clinicians is reentering the bag while wearing gloves that had patient contact. This failure to remove the gloves and perform hand hygiene before going back into the nursing bag with “used” gloves on inadvertently contaminates the interior contents of the bag. Never reenter the bag with gloves on. Remove the gloves if worn, perform hand hygiene, and then reenter the bag. It is suggested that the hand hygiene products and supplies be stored in an outer pocket of the bag that can be easily accessed.

Summary

Environmental contamination plays an important role in the transmission of several epidemiologically important pathogens, such as methicillin-resistant *S. aureus* and *C. difficile*. Further research with a large sample size is needed to determine best practice. Until research data are available, these “bag technique” strategies are low-tech, low-cost, and easy-to-implement by home care and home care clinicians to protect our immunocompromised

home care and hospice patients...and keep them out of the hospital and where they most want to be...in their homes. ■

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