

# An Exploratory Study of Nurse Bag Use by Home Visiting Nurses

Although the bag of the home care nurse is functional and historical, there is limited information in the literature about its use and nurses' preferences. This study analyzes how the bag is used, and examines comfort issues and preferences nurses have for this valuable tool. Implications for design and features are gained from this research as well as specific features to seek when choosing this important ergonomic tool.

Since 1893, when Lillian Wald founded the Henry Street Settlement (the first formal visiting nurse services in the United States), visiting nurses have carried bags containing essentials for care in the community and the patient's home. A literature search for nurse bag utilization information revealed no findings about this ubiquitous piece of nursing equipment. However, home care nurses know there are unique concerns related to carrying a bag, which include:

- organization for optimal work flow,
- functionality and access to supplies,
- ease in transport,
- ease of cleaning,
- physical comfort/discomfort associated with bag handling, and
- cost and durability.

Specialty bags are available that address many of these concerns; however, effectiveness and extent of their use is unclear. In 1999, an estimated 125,728 nurses made home visits in the United States, (HCFA Center for Information Systems, 2000). Following the major changes in home care delivery caused by the Balanced Budget Act of 1997 and PPS in 2001, that number significantly declined; yet most home care nurses carry a nurse bag while seeing patients. However, no studies



Photo courtesy of New York Visiting Nurse Service.

specifically describe how the nurse's bag is used. This exploratory study set out to document nursing concerns and preferences associated with bag use. The results can contribute to advances in comfort, effectiveness, and safety associated with this indispensable home care tool.

## Methodology

A 21-question survey was developed and reviewed by home care nursing and medical equipment experts prior to being approved by the University of Utah Health Sciences Institutional Review Board. Questions centered on general demographic information and bag utilization concerns. A random sample of 1,000 subjects was obtained from a list of 4,639 United States residents who subscribed to a professional home care nursing journal. A metered return envelope was included with each mailing, as well as \$1.00 as a small token of appreciation for participation. Surveys were mailed in a single bulk shipment and participants were given 3 months to respond. An opening note explained that responses would be completely anonymous, any question could be omitted at the discretion of the participant and, by completing the survey, consent was given to become a part of the study.



Kathleen L. Sitzman, MS, RN, Marjorie A. Pett, DSW, and Donald S. Blowski, PhD, PE, CPE

**Table 1.** Items Usually Carried in Bag

Item	N	%
Assessment tools (e.g., stethoscope, BP cuff)	474	94.4
Mask/gown/gloves	417	83.1
Paperwork/travel charts	234	46.6
Books/Manuals	212	42.2
Medical supplies (e.g., dressing change materials)	198	39.4
Cell phone	138	27.5
Pager	97	19.3
Lab and IV equipment	94	18.7
Laptop computer	74	14.7

**Note:** N = number of responses indicating the item was usually carried; % = percentage of respondents who usually carried the item.

Of the 1,000 surveys sent out, 502 (50.2%) were returned. Responses to the survey remained anonymous and each survey was given a tracking number for use during the analysis phase. Information was coded and entered into SPSS for windows (v.10) for statistical analysis.

## Results

### Sample Demographic Characteristics

Of the 502 respondents, 93.8% were registered nurses (RNs) and nurse managers, 5.1% were licensed practical nurses (LPNs), and 1.1% were home health aides. The National Association for Home Care (1999) reported that approximately 19.9% of home care nurses are LPNs and approximately 80.1% are RNs; thus, the respondent group had 13.7% more RNs and 14.8% fewer LPNs than national estimates.

The respondents were primarily female (96.5%). The American Nurses Association (2001) reported that 94.6% of all RNs are female and 5.4% male; thus, there were 1.9% fewer males in the survey sample versus the national average. Ages ranged from 23 to 69, with a mean age of 45.9 years. The average age of employed RNs was 43.3 (ANA, 2001); thus, survey respondents were slightly older than the national average.

### Perceived Physical Findings

*Present Level of Physical Fitness* as perceived by the respondent showed that 85.9% ( $n = 431$ ) reported an "average" or better state of physical fitness:

- Poor (2.0%)
- Fair (11.8%)

- Average (47.4%)
- Above average (23.9%)
- Excellent (10.2%)
- Exceptional (1.6%)

*Body mass index*, or BMI, is a basic measurement of overall risk for health problems associated with body weight. BMIs (Murray & Zentner, 2001, p. 602), were calculated from height and weight information obtained from the survey:

- Low or very low risk (79.5%)
- Moderate risk (11.0%)
- High risk (5.0%)
- Very high risk (4.5%)

It was notable that 83.1% of the respondents felt they were in an "average" or better state of physical fitness, and that 90.5% had a moderate or lower BMI risk estimate. If optimal body weight can be considered one of the possible signs of an average or better level of fitness, results of these two questions appear to be roughly consistent.

*Hours worked per week* ranged from 1 to 80, with the most common response being 40 hours per week. Of the full-time workers, 23.6% worked >40 hours per week. Years of employment in home care ranged from 0.5 to 36 (mean = 9.75).

*Who Provided the Bag?* A majority 74.9% ( $n = 376$ ) of the respondents indicated that their employer provided the nurse bag. Nurses provided their own bag 25.1% ( $n = 126$ ) of the time. It was noted by 7.93% ( $n = 40$ ) of the respondents that

two bags were used in tandem, meaning that the nurse switched back and forth between two bags. If a second bag was used, the respondent provided it 79.5% of the time.

**Bag Contents:** When asked to indicate items usually carried, assessment tools, masks, gown, and gloves were the most commonly carried items. (See Table 1 for detailed results.)

**Bag Transport:** Transport information was obtained in an effort to characterize basic bag handling habits. Most carried a bag at least 75% of the time while performing client visits, with most bags weighing 20 lbs or less (87.2%). The bags were most often unloaded from the front or back passenger seat and usually carried to and from the clients' homes 10 or fewer times per day. Most nurses climbed five or fewer flights of stairs per day (83.5%).

Despite the possibility of reporting multiple carrying options, nearly one-half of the respondents (47.4%) used shoulder straps only, 23.3% used handles only, and 20.3% used a combination of shoulder strap and handles. The term "shoulder straps" included shoulder strap use only, and does not include shoulder straps that are convertible to backpack straps. One of these three carrying options was used by 91.0% of all respondents. (See Table 2 for more detailed information about bag transport.)

### Discomfort Associated With Bag Use

The United States Department of Labor, Occupational Safety and Health Administration (OSHA) has recognized that various occupational activities can cause ergonomic discomfort or injury. While carrying a nurse bag was not specifically discussed as part of these occupational activities, overall risks associated with the manual handling of items that are similar in bulk and weight to nurse bags were described and can be compared to the handling of nurse bags (OSHA 3125, 2000; Waters, Putz-Anderson, Garg, 1994). Respondents were asked about any discomfort they experienced carrying their bags. A total of 39.7% of respondents reported no discomfort, 41.6% reported minimal discomfort, 17.4% reported moderate discomfort, and 1.3% indicated severe discomfort.

### Analyzing the Predictors of Discomfort

Logistic regression analysis was undertaken to determine which factors related to occupational activity best predicted reported discomfort. The

two factors that best predicted discomfort were the weight of the bag ( $p < .01$ ) and number of flights of stairs climbed daily ( $p < .001$ ).

- Nurses carrying a bag weighing  $>20$  lbs were 3.6 times more likely to report discomfort versus nurses carrying a bag weighing  $\leq 20$  lbs.
- Those who climbed more than five flights of stairs per day were 3.2 times more likely to report discomfort than nurses who climbed five flights of stairs or fewer per day.
- Other variables included in this regression analysis were; height, weight, age of the respondent, BMI, number of hours worked per week, years employed in home care, types of straps used to carry the bag, number of trips to and from client homes, and from where the bag was unloaded. No other study variables were significantly associated with discomfort.

**Discomfort Locations:** Respondents were asked to indicate discomfort in specific anatomical areas that could be associated with carrying a nurse bag. For those who indicated they experienced minimal,

## So, what would be an ideal nurse bag?

- Nylon or woven synthetic fabric with light-colored interior
- Sturdy, padded, comfortable shoulder straps and handles
- Many zippered pockets/compartments tailored for home care supplies
- Easy to wipe, spray, or machine wash
- Has straps or elastic to secure supplies
- Labeled, easy access pockets and compartments
- Waterproof exterior and one or two waterproof pockets
- Can attach a "sharps" container or has a sharps compartment
- Can attach a removable, washable, "dirty" compartment
- Streamlined, compact, and holds all necessities
- Weighs 20 lbs or less when fully loaded
- Extremely durable with an approximate cost of \$45.00



**Table 2.** Bag Transport Findings

% of time bag was carried			No. flights of stairs climbed per day		
	<i>N</i>	%		<i>N</i>	%
0-24	39	7.8	0-5	419	83.5
25-49	7	1.4	6-10	60	12.0
50-74	21	4.2	11-15	6	1.2
75-99	98	19.5	16-20	5	1.0
100	332	66.1	20-25	1	0.2
Responses not given	5	1.0	Responses not given	11	2.2
Bag unloaded from			Weight of bag (lbs)		
Front or back passenger seat	316	62.9	1-5	62	12.4
Trunk	150	29.9	6-10	187	37.3
Floor	52	10.4	11-15	137	27.3
Subway or bus	4	0.8	16-20	51	10.2
No. round trips in and out of client homes			21-30	43	8.6
0-5	189	37.6	30+	8	1.6
6-10	216	43.0	Responses not given	14	2.8
11-15	64	12.7	Carrying device(s) currently used		
16-20	18	3.6	Shoulder strap	347	69.1
21-25	6	1.2	Handles	224	44.7
Responses not given	9	1.8	Backpack style	17	3.5
<b>Note:</b> Some respondents chose more than one response and are formatted such that <i>N</i> = number of respondents who chose that option, and % = percent of respondents who chose that option out of a total of 502 respondents.			Wheels	12	2.4
			Waist strap	7	1.4
			Diagonal sling	5	1.0

moderate, or severe discomfort, the location of discomfort was most often in the shoulders (79.0%), neck (59.8%), or in both areas simultaneously (58.3%). No association was found between severity of discomfort and its location. In addition, no other study variables were significant predictors of severity or location of discomfort. (See Table 3 for detailed information about discomfort locations.)

### Other Preferences

**Cleaning and Fabric Preferences:** Respondents were given three choices regarding how they would like to clean their bag: 1. spray, 2. wet wipe down, and 3. machine wash. Data was unclear, with many respondents indicating one, two, or all three methods concurrently. There were several written comments next to this question indicating

that any convenient method would be welcome information. Nylon (33.9%) and woven synthetic (30.8 %) were the two most frequently chosen fabric preferences.

**Features Most Wanted in a Bag:** Respondents were given an opportunity to write in any other desired features. The comments received from the 502 respondents were numerous and descriptive indicating they were very interested in sharing their thoughts. Comments were clustered into 46 categories; Figure 1 lists the top 25.

Several features were infrequently mentioned, but showed ingenuity and creativity. For example, five respondents suggested including a detachable clean surface to be used for writing or during dressing changes. Four participants suggested that the bags be a bright or neon color so that they would

be less apt to be forgotten in a client's home. The addition of "feet" onto the bottom, so that the bag would not fully rest upon unavoidably unclean surfaces, and creating a disposable bag lining were also suggested.

When asked what a reasonable cost would be for a "bag that meets most or all needs," the average was \$39.00. There was a broad range of responses, from \$10.00 to \$300. The range that contained most of the respondents (71.3%) was \$20 to \$75.

## Implications for Home Care Nurses

### Discomfort Associated With Bag Use

Discomfort associated with bag use was experienced by 60.3% of the respondents, with 18.7% having moderate or severe discomfort. Two factors that were shown to influence discomfort were weight of the bag and flights of stairs climbed daily. Flights of stairs may be a factor that cannot be altered; however, encouraging the use of elevators where possible and decreasing the bag's weight may be helpful. Results showed that nurses who carried a bag weighing  $\leq 20$  lbs had a significantly lower incidence of discomfort.

It might be helpful for nurses to weigh their bags periodically and take measures to ensure that the bag weight does not exceed 20 lbs. If  $>20$  lbs of supplies are necessary, using two bags, each with different carrying devices, may be helpful to more evenly

distribute the load. Also, because a laptop computer can weigh up to 20 lbs, it may be wise to carry it in a separate bag, or place it in a bag on wheels, to be taken along while carrying the primary supply bag.

When carrying any load weighing  $\geq 10$  lbs, it is suggested that the following guidelines (OSHA, 2000, p. 8) be observed:

- Minimize the distance between the load [bag] and the body. *Nurses should bend at the knee rather than at the waist while lifting and use well-constructed carrying devices.*
- Lift loads [bags] from knuckle height [approximately mid-thigh level]. *This may be effectively accomplished by unloading the bag from the trunk or hatch area of a vehicle rather than the passenger seat or floor.*
- Try to keep the travel distance for the lift  $<10$  feet [from lift to destination]. *Keeping the travel distance  $<10$  feet would be unrealistic to accomplish for a home care nurse; however, advance planning, good organization, and careful selection of necessary supplies may be helpful in easing the load over distances exceeding 10 feet.*
- Minimize twisting when lifting or carrying. *This can be accomplished through mindful awareness of body positioning and appropriate education.*
- Provide good handles for grasping the load

**Table 3.** Location of Discomfort

Location	No. responses indicating discomfort, who chose this location	% respondents, with any level of discomfort in this location
Shoulders	171	79.0
Neck	130	59.8
Lower Back	60	28.0
Upper Back	33	15.0
Wrists	29	13.6
Hands	28	13.1
Fingers	27	12.6
Elbows	25	11.7
Mid-back	24	11.2
Hips	16	7.5
Thumbs	10	4.7
Knees	8	3.7

**Figure 1. Top 25 Features Most Desired in a Nursing Bag.**

Feature description	% of respondents wanting feature
Multiple/good variety of compartments	<b>75.4</b>
Adequate room for necessary items	<b>33.3</b>
Pockets/compartments organized for home care needs	<b>28.3</b>
Compact, not bulky or unwieldy	<b>24.1</b>
Constructed of lightweight fabric	<b>23.5</b>
Easy access for loading and unloading supplies	<b>12.9</b>
Easy to clean	<b>11.4</b>
Durable	<b>9.4</b>
Pockets and compartments close with zippers	<b>8.8</b>
File compartments for paperwork and traveling charts	<b>8.6</b>
Padded and/or comfortable shoulder strap	<b>7.7</b>
Sharps container holder or compartment	<b>6.8</b>
Separate “clean” and “dirty” sections	<b>6.8</b>
Laptop compartment	<b>4.4</b>
Easy to carry/has two types of comfortable straps to use	<b>4.4</b>
Wheels large enough to pass over curbs, grass, gravel, and snow	<b>3.8</b>
Functional/meets daily needs	<b>3.5</b>
Internal/external straps or elastic to secure supplies	<b>3.5</b>
Weatherproof/Waterproof	<b>3.3</b>
Dark color on outside of bag	<b>3.3</b>
Cell phone pocket	<b>3.3</b>
Bag can “sit up” by itself for easier access	<b>2.6</b>
Labeled or see-through compartments for quicker access	<b>2.2</b>
Plastic-lined outer pocket to hold hand-washing supplies	<b>2.0</b>
Light-colored interior so it is easier to see supplies inside the bag	<b>1.8</b>

[bag]. Use bags with ample padding and sturdy construction of handles and shoulder straps.

#### **Need for Orientation and Inservice Education**

Although the most common areas of discomfort were the shoulders, neck, and back, the survey results did not clarify *why* these areas were most affected. Discomfort could be the sum of client care activities, motor vehicle operation, and overall upper extremity fatigue associated with transporting and handling bags and other supplies. Ini-

tial new employee orientation and continuing education regarding the cumulative nature of upper extremity and back discomfort may be helpful in raising awareness so nurses can make individual adjustments in work habits where necessary.

#### **Possible Study Limitations**

As in most preliminary studies on a topic not previously surveyed, factors existed that could have influenced the validity of survey results. The random sample may not have been taken from a representative group of home care nurses since the

original database only contained nurses subscribing to their professional literature. A return rate of 50.2% is above the norm in most surveys but may have limited validity in this survey.

Individuals experiencing discomfort may have been more inclined to reply than those with no discomfort. Additionally, although every effort was made to pose questions in an unbiased format, the phrasing or choice of terms could have unduly influenced the responses. Mindful of possible limitations, results obtained suggest some constructive implications regarding how the nurse bag is used in home care.

## Conclusion

Nurse bags are an indispensable occupational tool for home care nurses. Through written comments associated with features wanted most in a bag, respondents of this survey indicated distinct preferences regarding what features would make a nurse bag use more comfortable and efficient. Survey results also showed that nurses *do* experience physical discomfort related to using a bag. Bag weight and stairs were two factors that influenced discomfort. Simple interventions exist that may decrease or eliminate this concern, such as limiting total bag weight to 20 lbs or less.

If given information and support, nurses may then have the option of improving their occupational comfort and efficiency. This exploratory study identified preferences and concerns associated with this common feature of home nursing. Further research is needed to more fully characterize issues surrounding nurse bag use. ■

## Acknowledgments

Funding for this study was provided by Hopkins Medical Supply Company, The Institute of Occupational Safety and Health, Sigma Theta Tau, and The Mechanical Engineering Department of the University of Utah.

*Kathleen L. Sitzman, MS, RN, is a Doctoral Student, University of Utah, College of Nursing, Salt Lake City, UT.*

*Address for correspondence: 468 East 3425 North, North Ogden, UT 84414 (e-mail: sitzmank@webpipe.net).*

*Marjorie A. Pett, DSW, is a Research Professor, University of Utah, College of Nursing, Salt Lake City, UT.*

*Donald S. Blomswick, PhD, PE, CPE, is an Assistant Professor, Department of Mechanical Engineering & Director, Ergonomics and Safety Program, Rocky Mountain Center for Occupational and Environmental Health, University of Utah, Salt Lake City, UT.*

## REFERENCES

- American Nurses Association. (2001). *Facts on nursing*. Washington, DC: Author.
- HCFA Center for Information Systems, Health Standards and Quality Bureau. (2000). Basic statistics about home care. Retrieved January 3 2001 from the World Wide Web: [www.nahc.org/consumer/hcstats.html](http://www.nahc.org/consumer/hcstats.html).
- Murray, R. B., & Zentner, J. P. (2001). *Health promotion strategies through the life span* (7th ed.). Upper Saddle River, NJ: Prentice Hall.
- United States Department of Labor, Occupational Safety and Health Administration. (2000). *OSHA Pamphlet # 3125* (revised).
- Waters, T. R., Putz-Anderson, V., & Garg, A. (1994). *Applications manual for the revised NIOSH lifting equation*. National Institute for Occupational Safety and Health, January 1994 (DHHS, NIOSH Publication No. 94-110). Available online at [www.industrialhygiene.com/calc/lift.html](http://www.industrialhygiene.com/calc/lift.html) or [www.cdc.gov/niosh/ergoPAGE.html](http://www.cdc.gov/niosh/ergoPAGE.html)

# HHS Releases New Statistical Study

The Health and Human Service Department (HHS) has released a new study that is the most extensive and comprehensive statistical resource on RNs with current licenses to practice in the United States.

In contrast with the 1980 survey, the new survey suggests that too few young people are choosing careers in nursing, and the average age of RNs has increased substantially. In 1980, 52.9% of RNs were below age 40, but by 2000, only 31.7% were under 40. In 1980, 26% of RNs were below age 30, but by 2000, less than 10% were under 30.

The entire 2000 nursing survey report is available at

<http://www.bhpr.hrsa.gov/nursing>.