

THE MANAGEMENT OF DEHYDRATION AND INCONTINENCE IN NONAMBULATORY GERIATRIC PATIENTS

PAUL F. SPANGLER, TODD R. RISLEY, AND DONALD D. BILYEW

PHILADELPHIA OFFICE OF MENTAL HEALTH/MENTAL RETARDATION AND
UNIVERSITY OF ALASKA

We evaluated a health care routine designed to decrease incontinence and improve the hydration level of nonambulatory nursing home patients. To implement this routine, a 3' x 4' cart was equipped with liquids and toileting equipment. A nurse's aid was assigned the task of taking the cart to each nonambulatory resident in a nursing home and offering specified assistance on a regular basis. Data demonstrated a decrease in physical dehydration, as well as in fecal and urinary incontinence.

DESCRIPTORS: nursing home, nursing aide, dehydration, incontinence

The care and treatment of nonambulatory geriatric residents poses special problems for nursing homes and other long-term care facilities. Due to the nature of their handicaps, these people have great difficulty performing basic functions, such as dressing and toileting. Because of understaffing, however, needed assistance is frequently unavailable, even in otherwise well-administered nursing homes. Consequently, medical problems can ensue. A common nursing care problem among the elderly, and particularly those who are bedfast, is dehydration. A second infirmity common among nonambulatory elderly is bowel and bladder incontinence.

Continence in this case refers simply to a patient voiding or defecating in a proper receptacle, rather than in one's clothing or bed. Surveys of long-term care facilities indicate that from 30% to 50% of all patients exhibit both bowel and bladder incontinence (Department of Health, Education, and Welfare [DHEW], 1976; Manard, Woehle, & Heilman, 1977). Incontinence can have serious medical repercussions. If not promptly handled by cleaning and turning the bedfast patient, bedsores and other infections may develop (Stolten, 1973). Traditionally, incontinence among the elderly has

been considered a persistent problem and treatment has had little success (Collins & Plaska, 1975). This has held true whether medically oriented techniques stressing dietary intake have been used (Habeeb & Kallstrom, 1976), or whether behavioral procedures using material or social reinforcement have been attempted (Grosicki, 1968; Pollock & Liberman, 1974).

Many nutritionists emphasize the importance of water in the diet of older persons (Fleck, 1976). Partly due to the nature of their handicap and partly due to the inattention to this problem by nursing home staff, many nonambulatory geriatric patients do not receive adequate amounts of liquid. This results in possible dehydration which, in turn, is associated with problems such as increased susceptibility to disease and constipation. Thus, dehydration can be a major health problem that, if unchecked, can result in serious illness or even death (DHEW, 1975).

METHOD

Residents and Setting

The research was conducted in a 100-bed, skilled care proprietary nursing home located in a mid-western town with a population of about 50,000. The 6-year-old nursing home was a single-story, brick structure offering both private and semiprivate accommodations. The nursing home population ranged in age from 26 to 101; 85% of the

We express appreciation to the staff and residents of the Cherry Manor Nursing Home who participated in this project.

Reprints may be obtained from Paul Spangler, 2403 Bryn Mawr Avenue, Philadelphia, Pennsylvania 19131.

residents were between 73 and 85 years old. Two-thirds of the residents were women. For the purpose of this study, one wing of the home was assigned to participate. All 30 people living in the wing were interviewed. From this group 16 residents (14 women and 2 men), constituting all the nonambulatory people on this wing were selected. None of these people were able to walk without the support of others. Ages ranged from 59 to 96. The mean length of stay at the home was 17 months.

Procedures

During the time residents were awake (6:00 a.m. to 9:00 p.m.), one aide per 5-hour shift was assigned to circulate through the residents' rooms with a $3\frac{1}{2}' \times 4'$ metal cart. This cart was equipped with juices, milk, cups, adult diapers, deodorant, powder, and towels. A set of written procedures was developed for use by nursing aides when they were taking the cart to the residents' rooms. The procedures specified that an assigned nursing aide would visit each resident's room approximately once every 1.5 hr, or 11 times between 6:00 a.m. and 9:00 p.m. On entering the room, the aide would first converse pleasantly with the resident, then would inquire whether the person cared for a cup of juice (several flavors were always available) or milk. The aide placed a 4-oz cup in the resident's hands, held the cup before the resident, and inquired whether the resident cared for anything to drink. If the resident gave a negative response, the cup was returned to the cart.

Next, the aide asked, "May I assist you to the bathroom?" or, if necessary, changed the resident's clothing if it was already soiled. After the resident finished using the bathroom, the aide made sure that that resident was dry, changed the soiled linens if necessary, and either returned the resident to bed or to a chair. Finally, the aide asked if the resident wanted anything else and told the resident that the cart would be brought back in 1.5 hr.

When not receiving the experimental procedures, residents were given standard nursing care, which had been in operation from the time the

nursing home was opened, and consisted of bed checks taken every 3 hr. The principal purpose of the bed checks was to change residents if they soiled or wet themselves. In contrast to the experimental procedures, residents were not prompted to drink liquids and they were not taken to the bathroom unless they made a specific request.

Nursing aides were trained to implement the procedures, and their performance was assessed on a 12-point checklist. Questions on the checklist included: (a) Has the cart been equipped with proper materials? (b) Does the aide converse with each resident when entering the resident's room? (c) Does the aide check bed or chair to determine whether resident has soiled self? and (d) Does the aide prompt the use of liquids? Nursing aides had to achieve 100% accuracy on this checklist before being assigned to take the cart to the residents' rooms.

The study was divided into five phases, each lasting 10 days. Data were collected only on the last 3 days of each phase, because it took approximately 7 days for proper hydration (or dehydration) levels to be reached. In the first phase (baseline), residents received standard nursing care. Following baseline, residents were matched according to the two dependent variables (dehydration level, frequency of incontinence) and randomly assigned to two groups, A and B.

In the second phase, the aides used the written procedures and cart for Group A, while Group B continued to receive standard nursing care. In the third phase, the process was reversed with Group B receiving special intervention and Group A obtaining standard care. Baseline was reestablished with both groups in the fourth phase, and in the fifth phase, both groups received experimental procedures.

To minimize disruption among regular staff, during the first four phases, additional personnel were hired to carry out the special health care routine. In the fifth phase, once the procedures were found to be effective, regular nursing aide staff were trained and subsequently carried out the procedures.

Measurement

Dehydration was assessed with a urinometer (a hydrometer that measures the specific gravity of urine). The apparatus consists of a straight flask with a floating thermometer-like instrument. The greater the mineral concentration of the supporting liquid, the higher the hydrometer will float in that liquid. Basically, an increasing score on the urinometer indicates a decreasing percentage of water in the urine. For nursing home residents, a score between 10 and 20 was deemed optimal. A score of 20 or 21 represented borderline dehydration, and a score of 22 or greater signified dehydration (Sunderman, 1950).

Two samples of urine per resident were collected in the morning and measured using the urinometer. Samples were obtained on the first and third days of the data collection period. As a reliability check, a second observer immediately checked the aide's data collection results by retesting the sample, recording data independently, and comparing for accuracy. If the second recorder's observation differed from the first recorder's observation by more than ± 1 point, it was counted as a disagreement. Reliability was then computed by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. Approximately 25% of all urine samples were used as reliability checks. Reliability for the urinometer scores ranged from 80% to 100% with a mean of 92%.

Incontinence was measured by placing plastic bags with the resident's name attached inside each bathroom. Nursing aides were instructed to place all soiled or wet diapers in the bags. Three set times during the day (early morning, midafternoon, and evening) the diapers were collected and an observer recorded whether each resident had soiled during the previous time interval; also, each resident was checked by the observer to determine whether he or she was soiled but had not as yet been cleaned by the nursing aide. This information was also recorded. Reliability checks during each phase were taken on whether a resident was soiled, by having a second observer independently record

whether or not a diaper was soiled or wet. Agreements were then divided by the number of agreements plus disagreements. Diaper checks were taken on every resident during both treatment and nontreatment. A total of 63 such checks were made. Reliability for the diaper check was 97%.

In addition to checking the diapers, a second reliability check was made to determine whether nursing aides were actually placing the soiled diapers in the bags. To do this, an observer circulated through the nursing home, briefly looking into each nonambulatory resident's room to see if the resident was being changed and cleaned by an aide. Aides were not informed of the reasons for the spot checks. If the resident was being changed, the observer returned 10–15 min later, after the aide had left, and checked the bag in the bathroom to see whether a soiled diaper was placed in it. If a diaper wasn't in the bag but the aide was previously observed changing the resident, it was counted as an error. Correct responses (diapers placed correctly in the bag) were then divided by errors plus correct responses. Reliability to determine whether diapers were being placed in the bag was 80%. Checks for this were conducted in the second through the fifth phases.

RESULTS

Dehydration

Figure 1 shows mean urinometer scores for Groups A and B as a function of liquids (juices) being offered when the cart procedures were used versus liquids not being offered when standard nursing care was provided. For both groups, urinometer scores dropped once liquids were offered, and increased again during standard nursing care. Results were both clinically and statistically significant. Prior to intervention, four residents (25%) had scores higher than 20, indicating dehydration. After intervention, however, no individual obtained a urinometer score greater than 20, indicating the total absence of dehydration in the two groups. On the other hand, two residents were slightly overhydrated with mean urinometer scores

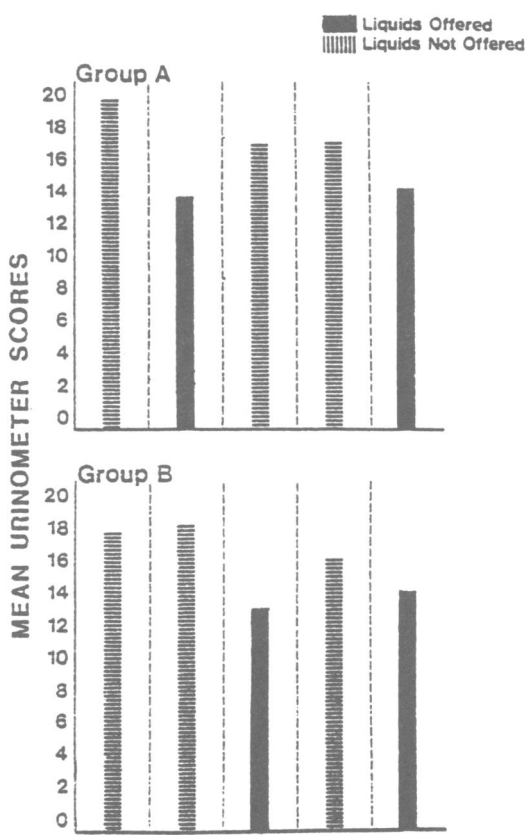


Figure 1. Mean urinometer scores over 3-day periods for two groups.

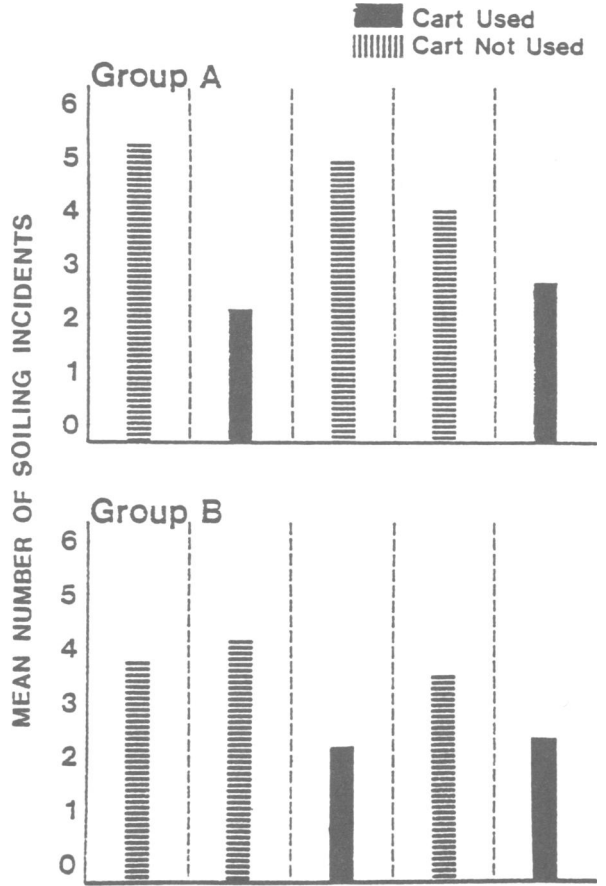


Figure 2. Mean frequency of soiling over 3-day periods for two groups.

slightly below 10, indicating a need to monitor urinometer scores closely. When mean urinometer scores were compared across standard nursing care (no prompting) and cart procedures (prompting) in the second and third phases, differences were found to be statistically significant ($p < .002$) using a *t* test for repeated measures.

Incontinence

Figure 2 shows the mean number of soiling incidents across 3-day periods when the cart routine was and was not used. The figure includes diaper counts for both the morning and afternoon shifts.

During the day, when the cart was in use (6:00 a.m. to 9:00 p.m.) eight residents (50%) had no incidents of soiling. This contrasts with

daytime periods when the cart was not in use, and only two residents remained continent.

DISCUSSION

We found that routines of regular prompts and assistance can have a positive effect on continence and hydration levels on elderly, nonambulatory nursing home residents with potential benefits to their physical health. These routines can easily be incorporated into existing nursing care procedures as was demonstrated in the last phase of the study when regular aides and orderlies operated the cart and produced comparable effects. Although, as indicated during baseline, only 25% of the patients

were dehydrated, this figure is clinically significant because of its medical implications and the relative ease with which the problem can be eliminated.

A point frequently raised in applied studies is whether the project in question contains features that will allow for its maintenance over time by the regular staff. This project contained several such features including: (a) incorporating a system of regular data collection, such as forms to record urinometer scores, and (b) having supervisory personnel use performance checklists. Four months after the study was completed, data from these checklists indicated that the cart and written procedures continued to be a regular feature of the nursing care routines.

REFERENCES

- Collins, R. W., & Plaska, T. (1975). Mower's conditioning treatment for enuresis applied to geriatric residents of a nursing home. *Behavior Therapy*, *6*, 632-638.
- Department of Health, Education, and Welfare. (1975). *Long term care facility improvement study*. Washington, DC: U.S. Government Printing Office.
- Department of Health, Education, and Welfare. (1976). *Facts about older Americans*. DHEW Publication No. (OHD) 77-2006. Washington, DC: U.S. Government Printing Office.
- Fleck, H. (1976). *Introduction to nutrition*. New York: Macmillan Publications.
- Grosicki, J. (1968). Effect of operant conditioning on modification of incontinence in neuropsychiatric geriatric patients. *Nursing Research*, *17*, 304-311.
- Habeeb, M. C., & Kallstrom, M. D. (1976). Bowel program for institutionalized adults. *American Journal of Nursing*, *76*, 606-608.
- Manard, B. B., Woehle, T. R., & Heilman, J. M. (1977). *Better homes for the old*. Lexington, MA: D.C. Heath.
- Pollock, D. D., & Lieberman, R. P. (1974). Behavior therapy of incontinence in demented inpatients. *The Gerontologist*, *14*, 488-491.
- Stolten, J. H. (1973). *The geriatric aide*. Boston: Little, Brown, and Co.
- Sunderman, F. W. (1950). *Normal values in clinical medicine*. Philadelphia: Saunders.

Received April 5, 1983

Final acceptance February 28, 1984