NUTRITIONAL INTAKE
Use of Touch and Verbal Cuing

Many hospitalized elderly patients suffer from inadequate nutritional intake (Gupta, 1988; Infante-Rivard, 1986; Mobarhan, 1987, 1991; Morley, 1986; Rudman, 1989; Sandman, 1987; Sullivan, 1989). These patients may not eat properly because of pain, emotional stress, physical deficits, or inability to attend to the process of eating (Mobarhan, 1991). Because poor nutrition affects healing, skin integrity, and psychological well-being, it is often partially responsible for extended hospitalization (Morley, 1986). In addition, the cost of supplementing a patient's diet to compensate for poor nutrition can range from a few dollars per day for noninvasive supplements to several hundred dollars per day for invasive procedures.

Inexpensive, practical means of improving geriatric patients' nutritional well-being are needed in order to increase patient quality of life and reduce patient and facility costs. Unfortunately, there is little research on noninvasive therapy for improving the nutritional intake of hospitalized elderly patients. Invasive methods for improving nutritional status have been studied, but the lasting effect of these treatments is questionable and their complications, such as diarrhea and electrolyte imbalance, can be more harmful than poor nutrition (Mobarhan, 1991).

The use of touch and verbal cuing has been investigated as a method for increasing the nutritional intake of patients who experience chronic organic brain syndrome (COBS) (Eaton, 1986). The touch used was gentle, nonprocedural contact between the caregiver's hand and the patient's forearm, and the verbal cuing consisted of positive verbal encouragement to eat. Both touch and verbal cuing were used intermittently during meals in an attempt to encourage eating. This study found statistically significant increases in the mean caloric and protein intake of patients who experience COBS when both touch and verbal cuing were used. Patients in this study who were verbally encouraged to eat but not touched did not show statistically significant increases in mean caloric or protein intake.

These results suggest that touch and verbal cuing may be a possible means of increasing nutritional intake in hospitalized geriatric patients. However, two important questions remain. Can touch and verbal cuing be used to increase the nutritional intake of elderly patients without severe cognitive dysfunction? If so, what is responsible for the increased

BY MARY ELLEN LANGE-ALBERTS, ND, RN; AND SUSAN SHOTT, PhD

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What is responsible for the increased nutritional intake: touch, verbal cuing, or the combination of touch and verbal cuing?

METHOD

Sample
A study was conducted at the long-term care facility of a major medical center in Chicago, Illinois, using a convenience sample of 20 elderly patients without severe cognitive dysfunction. Only one eligible patient refused to participate in the study. The mental status of each patient in the sample was assessed with the Mini-Mental State Examination (Crum, 1993).

All the patients in the study were identified by the staff as having poor nutritional intake at the facility. Patients were considered to have poor nutritional intake if they were underweight, ate less than 50% of all meals, or ate less than three meals per day. Skin fold measurements were not used to assess nutritional intake for two reasons:
• The use of these measurements for hospitalized patients has been questioned, because changes due to disease or stress can introduce serious measurement errors (Grant, 1986); and
• We wanted to include patients with inadequate nutritional intake whose skin fold measurements were normal. (Patients can develop a poor nutritional status long before their skin fold measurements become abnormal [Jeejeebhoy, 1990].)

Ages of the patients ranged from 60 to 104 years. Eighteen of the patients were white; two were black. Fourteen patients were female. Their diagnoses were varied and included fractures, lung carcinoma, uterine carcinoma, degenerative bone disease, chronic obstructive pulmonary disease, and acute pyoderma gangrenosum. At the beginning of the study, the length of hospitalization in the unit ranged from 1 to 15 days.

Measures
The percentage of food consumed was determined for each food item by measuring the food left on the tray after the meal. Kilojoule and protein charts provided by the nutrition staff were used to calculate the kilojoules and grams of protein consumed for each meal. The food quantifier did not know the type of treatment given.

A pilot study with two raters and 24 meals examined the reliability of the measure of the percentage of food consumed. The interrater reliability was 0.81 and the Pearson correlation coefficient was 0.98.

PROCEDURE
Approval for this study was obtained from the medical center's human investigation committee. Verbal consent of patients and staff members participating in the study was obtained. Each patient was given a written description of the study that did not indicate the purpose of the study. This description also was read to each patient. Patients were told that refusal to participate would not affect their care in any way. Confidentiality was maintained by labeling data with identification numbers rather than names.

Six certified nursing assistants at the long-term care facility participated in the senior author's teaching program concerning the effects of verbal and nonverbal communication on the care of geriatric patients. For 5 consecutive weekdays during the week before treatment began, the lunch food intake was measured for patients who agreed to participate in the study. These data were used to obtain the lunch kilojoules and lunch protein consumed on each day of the 5-day pretreatment period.

After all the pretreatment data were collected, patients were divided into three groups according to their total pretreatment lunch caloric intake (low, medium, or high). These groups were used to carry out stratified randomization with a random number table in order to assign patients to three treatment groups. The touch-and-verbal-cuing group received intermittent forearm touch and verbal encouragement to eat during lunch (seven patients). Two comparison groups were used: a touch group, which received only intermittent, nonprocedural forearm touch during lunch (seven patients), and a verbal-cuing group, which received only intermittent verbal encouragement to eat during lunch (six patients). Stratified randomization en-
TABLE I

**Pretreatment and Treatment Caloric Intake (kJ)**

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>n</th>
<th>Pretreatment Mean</th>
<th>SD</th>
<th>Treatment Mean</th>
<th>SD</th>
<th>P-Value for Difference</th>
<th>Interval for Difference*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Touch and Verbal</td>
<td>6</td>
<td>1556.18</td>
<td>364.14</td>
<td>3337.99</td>
<td>531.85</td>
<td>0.00003</td>
<td>(1354.79, 2208.78)</td>
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<tr>
<td>Cuing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Touch</td>
<td>7</td>
<td>1518.93</td>
<td>259.22</td>
<td>3254.24</td>
<td>458.18</td>
<td>0.0002</td>
<td>(1016.95, 2453.72)</td>
</tr>
<tr>
<td>Verbal Cuing</td>
<td>4</td>
<td>1451.44</td>
<td>372.29</td>
<td>3603.68</td>
<td>326.00</td>
<td>0.005</td>
<td>(723.41, 3581.05)</td>
</tr>
</tbody>
</table>

*Confidence = 98.3%.

sured that the three treatment groups were similar with respect to pretreatment caloric and protein intake during lunch.

Treatment began on the 3rd day after obtaining all the pretreatment data. Five certified nursing assistants administered the treatments in each patient’s room. The lunch food intake was measured during the five consecutive weekdays of treatment, then used to obtain the lunch kilojoules and lunch protein consumed on each day of the 5-day treatment period.

Line charts of the daily caloric and protein intake means showed no upward or downward trends during the pretreatment or treatment periods. All the fluctuations in nutritional intake within each study period were associated with differences in the palatability of the meals. The absence of upward or downward trends within each study period allowed combination of each patient’s multiple nutritional intake measures by averaging them. For each patient, a single measure of pretreatment caloric intake was obtained by averaging the five pretreatment caloric intake values for the patient. A single measure of treatment caloric intake was obtained by averaging the patient’s five treatment caloric intake values. Averaging over 5-day periods was done in the same way to obtain measures of pretreatment and treatment protein intakes.

For each treatment group, histograms of the differences between the treatment and pretreatment measures were consistent with sampling from normal or approximately normal populations. Two-sided paired t-tests were done for each treatment group to compare the treatment caloric intake mean with the pretreatment caloric intake mean, and to compare the treatment protein intake mean with the pretreatment protein intake mean.

One-way analysis of variance (ANOVA) was used to compare the three treatment groups with respect to the mean change in caloric intake and the mean change in protein intake. Before one-way ANOVA was done, Levene’s test was used to check the assumptions of equal caloric-difference variances and equal protein-difference variances for the three treatment groups. No statistically significant differences between the variances were found ($p = 0.2876$ for the caloric differences and $p = 0.7262$ for the protein differences).

Because six paired t-tests were done, a Bonferroni adjustment for multiple tests was used to reduce the probability of a Type I error for the t-tests. The overall significance level of 0.10 was divided by 6 to obtain a significance level of 0.017 for each t-test. Bonferroni-adjusted 98.3% paired-samples confidence intervals were obtained for differences between population treatment and pretreatment means. The overall confidence level was 90%. An unadjusted significance level of 0.10 was used for each one-way ANOVA to increase the probability of detecting differences between the treatments.

**RESULTS**

Seventeen of the 20 patients completed the study. A black female patient in the verbal-cuing group and a white female patient in the touch-and-verbal-cuing group were discharged before the end of the study, and a white male patient in the verbal-cuing group withdrew from the study.

For all three groups, there was a statistically significant increase in the mean caloric intake during treatment (Table 1). Confidence intervals sug-
TABLE 2

<table>
<thead>
<tr>
<th>Treatment Group</th>
<th>Pretreatment</th>
<th>Treatment</th>
<th>P-Value for Difference</th>
<th>Interval for Difference*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>Touch and Verbal Cu-</td>
<td>6</td>
<td>17.57</td>
<td>6.39</td>
<td>30.19</td>
</tr>
<tr>
<td>ing</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Touch</td>
<td>7</td>
<td>19.80</td>
<td>4.70</td>
<td>37.51</td>
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<tr>
<td>Verbal Cuing</td>
<td>4</td>
<td>17.11</td>
<td>3.12</td>
<td>36.78</td>
</tr>
</tbody>
</table>

*Confidence = 98.3%.

gest that, for each group, the increase in the mean caloric intake would be large in the population. Thus, the increases in mean caloric intake appear to be significant clinically as well as statistically. When the three treatment groups were compared with respect to the mean change in caloric intake, no statistically significant differences were found (one-way ANOVA, p = 0.4050).

Similar results were obtained for the mean protein intake. For all three groups, a statistically significant increase in the mean protein intake during treatment was found (Table 2). For the touch and verbal-cuing groups, confidence intervals suggest that these increases are large enough to be clinically significant. There were no statistically significant differences between the three treatment groups with respect to the mean change in protein intake (one-way ANOVA, p = 0.3450).

**DISCUSSION**

The results of this study suggest that touch, verbal cuing, and the combination of touch and verbal cuing may all be effective methods for increasing the nutritional intake of hospitalized elderly patients without severe cognitive dysfunction. All three treatments appeared to be effective, which suggests that providing any nondistracting, positively reinforcing human contact during meals may increase nutritional intake.

Touch and verbal cuing require minimal staff time and no equipment. In this study, certified nursing assistants spent less than 5 minutes administering treatment to each patient during the meal. If further research supports this study’s findings, touch and verbal cuing may serve as an inexpensive, practical way to improve geriatric patients’ nutritional well-being.

Caution is necessary when generalizing the results of this study, however, for several reasons:

- The patients studied may not be similar to other elderly patients;
- Because this study’s chance of detecting a large difference between the treatments was only 34% (Cohen, 1988), the treatments may differ in effectiveness despite the fact that no statistically significant differences were found in this study; and
- Long-term effects were not assessed—touch and verbal cuing may become ineffective over time.

**CONCLUSION**

Studies with larger samples and patients in other diagnostic categories are needed to determine whether touch and verbal cuing consistently produce increases in nutritional intake and whether any treatment is more effective than the others. Male patients and nonwhite patients should be studied, as most of the patients in this study and the COBS study were white women. Long-term studies also are needed to assess the effectiveness of touch and verbal cuing over time. In addition, other types of nondistracting, positive reinforcement should be investigated as possible means of increasing nutritional intake.

**REFERENCES**


Eaton, M., Mitchell-Bonas, I.L., Friedmann, E.
KEY POINTS

1. Many hospitalized elderly patients have inadequate nutritional intake.

2. Inexpensive, practical means of improving the nutritional status of elderly patients are needed.

3. Touch, verbal cuing, and the combination of touch and verbal cuing may be effective methods for increasing the nutritional intake of hospitalized elderly patients without severe cognitive dysfunction.


ABOUT THE AUTHORS

Mary Ellen Lange-Alberts, ND, RN, is Nurse Practitioner, North Chicago Veterans Affairs Medical Center; Susan Shott, PhD, is Director, Biostatistical Unit, Rush Cancer Institute, Chicago.

Address correspondence to Susan Shott, PhD, Director, Biostatistical Unit, Rush Cancer Institute, 1725 W. Harrison, Suite 855, Chicago, IL 60612.